

City of Tukwila

John W. Rants, Mayor

Department of Community Development

Steve Lancaster, Director

May 20, 1997

Dear Readers:

Please find attached to this letter, a copy of the Draft Environmental Impact Statement for the Manufacturing Industrial Center Implementation Plan.

The Tukwila "Manufacturing Industrial Center" (MIC) encompasses the industrial corridor north of the S. 126th St. road alignment, along both sides of the Duwamish River, to the north City Limits, excluding the Allentown residential area.

This MIC Implementation Plan has been prepared pursuant to the policies of the Tukwila Comprehensive Plan. The Comprehensive Plan has designated the MIC for a mix of heavy and light industrial uses, directed the updating of the shoreline master plan, and directed the preparation of implementing regulations which facilitate area development in a comprehensive and environmentally sound manner.

The Plan generally consists of three elements:

1. a revised shoreline plan for this area, which would be an element of the city-wide shoreline management plan,
2. a subarea plan consisting of a comprehensive infrastructure and areawide regulatory review, which has been structured to mirror the format of an EIS, for integrating SEPA with the subarea implementation plan and
3. proposed regulatory changes which include early SEPA Planned Action review (where project level environmental review is done during the subarea plan phase) and development standard revisions.

We encourage your comments on this Draft EIS. Written comments on the DEIS must be submitted no later than June 19, 1997. Comments should be addressed to Steve Lancaster, Director; City of Tukwila Department of Community Development; 6300 Southcenter Boulevard, Suite 100; Tukwila, WA, 98188. Questions on this project may be directed to myself, Jack Pace, or Vernon Umetsu (431-3684).

Sincerely,

A handwritten signature in black ink, appearing to read "Steve Lancaster", written in a cursive style.

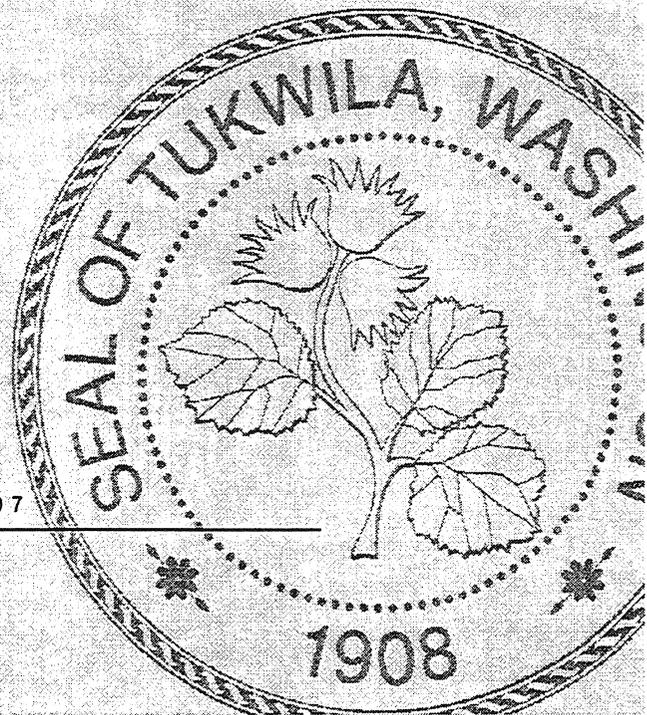
Steve Lancaster

DCD Director and SEPA Responsible Official

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Integrated GMA Implementation Plan and Draft Environmental Impact Statement

City of Tukwila



May 1997

Fact Sheet

Project Title	City of Tukwila, Manufacturing Industrial Center Implementation Plan
Proposed Action	Adoption of a <u>Planned Action Ordinance</u> that revises the shoreline master plan for the MIC, revises development regulations to incorporate environmental protection and remove unneeded requirements, and adopts the Integrated GMA/MIC Implementation Plan
Proponent and Lead Agency	City of Tukwila Department of Community Development 6300 Southcenter Boulevard, Room 100 Tukwila, WA 98188
Materials Incorporated by Reference	<ul style="list-style-type: none">• Background Elements and Other Supporting Information for the Tukwila Comprehensive Plan• Tukwila Comprehensive Plan and EIS, 1995• Boeing Duwamish Corridor Redevelopment Environmental Impact Statement, 1992• Tukwila Comprehensive Sewer Plan, 1991• Tukwila Comprehensive Water Plan, 1991• Tukwila Surface Water Comprehensive Plan, 1993• Tukwila Capital Improvement Plan, 1994• Tukwila Six-Year Transportation Improvement Plan, 1995• Tukwila Sensitive Areas Ordinance, 1991 et. seq.
Implementation	Adopting a Planned Action Ordinance by the Tukwila City Council is anticipated in late 1997
SEPA Responsible Official	Steve Lancaster, Director City of Tukwila Department of Community Development Telephone: 206/431-3670 6300 Southcenter Boulevard, Room 100 Tukwila, Washington 98188
Contact Person	Jack Pace, Planning Manager Vernon Umetsu, Associate Planner Telephone: 206/431-3684 6300 Southcenter Boulevard, Room 100 Tukwila, Washington 98188
Location of Documents	City of Tukwila Department of Community Development offices, located in Suite 100 6300 Southcenter Boulevard Tukwila, Washington Office hours are from 8:30 a.m. to 5:00 p.m.

Fact Sheet

Comments on the Draft EIS

All comments should be addressed to:

SEPA Responsible Official
City of Tukwila
Department of Community Development
6300 Southcenter Boulevard, Room 100
Tukwila, Washington 98188
Attn: Vernon Umetsu

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Licenses/Permits Required

None

Date of Issuance of Draft EIS

May 20, 1997

Due Date for Written Comments

June 19, 1997

sea1002E038.DOC

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Chapter 1

Summary

Introduction and Project Background

Tukwila's Manufacturing and Industrial Center (MIC) is an important regional center of industrial activity. It is one of only four such centers designated in King County, and is well-served by the regional transportation system and an existing utility infrastructure. It has a long history of manufacturing use, and is nearly fully developed.

Tukwila's Comprehensive Plan includes an MIC Element that reaffirms the area's role as an appropriate location for manufacturing and industrial activities. The city is proposing the MIC Implementation Plan at this time, with an emphasis on how to better realize the vision of responsible industrial development identified in the Comprehensive Plan.

The subarea has been the focus of a previous multi-site environmental review. In 1992, a programmatic environmental impact statement (EIS) was prepared for the Duwamish Corridor master plan, a proposal to redevelop Boeing properties in the MIC over a 10-year period. This current subarea plan/EIS updates and extends the previous analysis of the corridor's Boeing properties (about 650 acres) to the entire MIC subarea (about 1,000 acres). It also builds on the information developed for the city's Comprehensive Plan and Comprehensive Plan EIS efforts of 1994, and applies the "planned action" approach identified in new state legislation intended to facilitate development consistent with a city's comprehensive planning efforts under the Growth Management Act.

Project Description

The Proposed Action includes three elements:

1. A revised MIC shoreline Master Plan, as a component of the city-wide shoreline master plan
2. An integrated subarea plan/SEPA review, which applies the "planned action" option of consolidated area-wide environmental review
3. A package of recommended regulatory revisions to remove redundant or unneeded requirements and add requirements and guidelines, as appropriate

A more complete description of the Proposed Action is included in Chapter 2 of this EIS.

Summary of Impacts and Mitigation Measures

The impact analysis for this EIS was based on three hypothetical "prototypes," which were developed to illustrate the range of issues likely to be raised by development proposals in the MIC. The prototypes cover a range of permitted uses, from warehouse and distribution, to research and development, to manufacturing and laboratory. The analysis consisted of

“testing” the prototypes to identify potential gaps and overlaps in Tukwila’s codes and regulations that apply to review of development proposals. From this review, recommendations were prepared to ensure that environmental safeguards will be in place within the City’s codes and development review procedures to address future development proposals.

In general, the potential for environmental impacts resulting from the MIC implementation plan is relatively low. The plan’s primary focus is a more integrated review process for projects consistent with the City’s stated goals and policies for the MIC, as set forth in the Tukwila Comprehensive Plan and the proposed Shoreline Master Program. Projects covered by this SEPA analysis will by definition be consistent with these plans and the City’s zoning code and in compliance with all other applicable federal, state, and local regulations. Development will be in keeping with the area’s current and historical use for manufacturing and industrial activities, many aspects of which are strictly regulated under laws governing hazardous materials, air pollutant emissions, wastewater discharges, and the like. Finally, much of the area has been the subject of previous environmental review incorporated by reference into this document, including the 1992 Boeing Company Duwamish Corridor EIS and the EIS on the 1995 Tukwila Comprehensive Plan.

Table 1-1 provides a summary of impacts and mitigation measures by element of the environment. Fuller descriptions of these issues can be found in Chapters 3 through 6 of this document.

Table 1-1

Summary of Impacts and Mitigation Measures

Element of the Environment	Impacts of MIC Implementation Plan	Proposed Mitigation Plan
Land Use		
Consistency with plans and policies	All projects would be consistent with Tukwila comprehensive plan and zoning code and King County countywide planning policies	None required.
	Conformance with FAA-imposed height restrictions for KCIA must continue to be observed.	Develop a process to notify airport and developers when proposals may have height impacts.
	SEPA review would not be required for development included in implementation plan.	Mitigation for projects covered under the plan will be incorporated into codes through this SEPA process; consistency determination will ensure that projects become subject to SEPA if thresholds are exceeded.
Direct land use impacts	Potential for increased bulk and scale and more intensive uses at prototype sites. Similar changes could occur at vacant and redeveloping sites throughout MIC over time.	None, as changes would be consistent with adopted policies and zoning for the area.
Shoreline Use		
Consistency with plans and policies	Projects would be consistent with proposed SMP policies and regulations (not yet adopted).	None required.
Direct shoreline impacts	Bulk and scale would increase with elimination of 35' height limit under current regulations; elimination of BAR design review could result in shoreline aesthetic impacts	Develop design guidelines and administrative design review process for projects in shoreline overlay district not otherwise subject to design review
	Riparian vegetation could be removed as a result of development under proposed regulations	Formally designate sites identified as habitat protection/restoration areas and protect from development. Adopt habitat restoration policies and model ordinance from Lower Duwamish Habitat Restoration Plan.

Transportation

Level of Service

Levels of service at two intersections drop to LOS F by 2010.

Modifications to signal phasing at one intersection; new signal and intersection channelization at the second.

Review of Proposals

Site-specific traffic studies formerly required through SEPA no longer required.

Require site-specific traffic studies by modifying existing concurrency ordinance. Include guidelines for study content. Require SEPA review for projects that increase delay by more than 30 seconds at two identified intersections.

Other Elements of the Environment

Public Services and Utilities

Capacity to provide water, sewer, and power is adequate to serve MIC.

None.

Stormwater

Existing regulations require new commercial development to address on-site stormwater adequately.

Amend Ordinance 1755 to clarify that its requirements apply specifically to industrial development.

Project Description

Purpose

This project seeks to maximize the vitality of industrial uses in the Tukwila Manufacturing Industrial Center (hereafter referred to as the MIC). The MIC is a designated subarea within the Tukwila Comprehensive Plan, which has been reserved for industrial uses in policy and regulations. It is also part of an Industrial Manufacturing Center designated by the King County Growth Management Planning Council (multi-city and County body established to provide planning coordination within King County. It includes representatives of all cities within King County and the King County Council).

The MIC generally includes 1,000 acres as shown in the attached map, Figure 2-1. The area has a pattern of large-lot ownership and a mixture of vigorous heavy and light industrial activity and vacant or under-utilized facilities. This mixture of industrial activity largely reflects the stability of the Boeing Company and the decline of other heavy industrial companies in the area.

This planning project is to facilitate improvement of the MIC as a first-class industrial area. It will build upon previous studies to:

- Implement existing Comprehensive Plan policies
- Revise the shoreline master plan for consistency with the Comprehensive Plan
- Review/modify development regulations, HB 1724 permit processes and infrastructure plans to facilitate environmentally sound area improvement

Project Background

In 1995, Washington's state legislature passed a regulatory reform measure officially known as Engrossed Substitute House Bill 1724. ESHB1724 has since become known for its requirement that local governments integrate environmental review with growth management planning.

ESHB1724 authorizes a consolidated environmental review for what it terms "planned actions." The legislation notes that the "planned action" approach to environmental review may be better suited to a smaller area than a full city or county; it identifies "subarea plans" as appropriate for the approach.

Tukwila proposes to apply the "planned action" approach to its manufacturing/ industrial center (MIC) subarea. The MIC subarea has a history of more than 50 years of industrial development. Although the Duwamish River flows through the MIC, the industrial and manufacturing sites generally rely more heavily on surface transportation, with access from the freeway system provided by East Marginal Way South. The city has invested in the subarea's infrastructure, particularly with its current improvements to East Marginal Way

South. The city's vision is that redevelopment maintain and enhance the MIC as a "world-class industrial center."

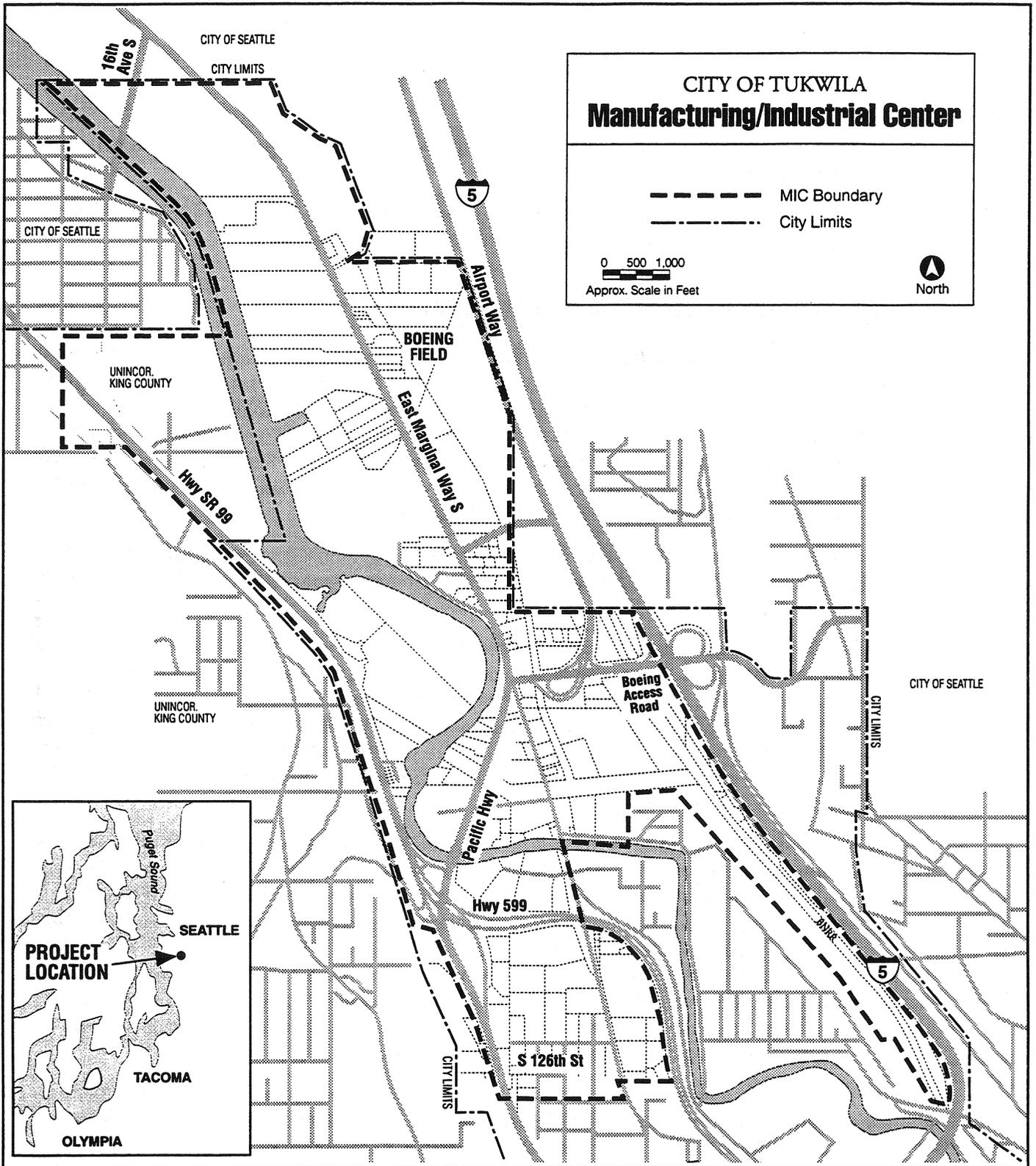
The MIC subarea is shown in Figure 2-1. Tukwila proposes to use the planned action provisions of ESHB1724 to expedite the responsible redevelopment of the MIC subarea. The MIC subarea plan calls for modifications to the zoning code, shoreline master program, and other development review processes to clarify the city's rules for property owners, to streamline the project review and approval process, and to incorporate environmental protection into development standards. Tukwila anticipates that the project would conclude with City Council adoption of a revised Shoreline Management Plan, a package of revisions to current regulations, and a Planned Action Ordinance.

The area is substantially developed and, therefore, has few remaining undisturbed natural resources (with the exception of the Duwamish River), is relatively small in area, and has only two zoning designations (MIC/Light and MIC/Heavy). The area is developed with a mix of industrial, manufacturing, and distribution uses. Some office uses also exist in the corridor, including The Boeing Company's corporate headquarters, located at the northern end of the MIC. In addition, King County Airport occupies a large area on the east side of East Marginal Way South. Refer to Chapter 3 for a discussion of existing land uses and land use impacts resulting from the proposal, and to Chapter 4 for a discussion of shoreline issues.

Policy guidance for subarea development has been consistent. The MIC is recognized in King County's Comprehensive Plan as one of only four designated manufacturing/industrial centers in the county. The MIC element of the city's new Comprehensive Plan reaffirms the area's role and future as a manufacturing and industrial center.

The proposed MIC implementation plan is consistent with the policy direction of the countywide planning policies and the Tukwila Comprehensive Plan. A new preferred pattern of development is not proposed. Rather, the focus of the implementation plan is on how to better realize the vision of responsible industrial development identified in the Comprehensive Plan.

The subarea has been the focus of a previous multi-site environmental review of Boeing Company facilities. In 1992, a programmatic environmental impact statement (EIS) was prepared for the Boeing Company Duwamish Corridor master plan, a proposal to redevelop Boeing properties in the MIC over a 10-year period. This current subarea plan/EIS updates and extends the previous analysis of the corridor's Boeing properties (about 650 acres) to the entire MIC subarea (about 1,000 acres). It also builds on the information developed for the city's Comprehensive Plan and Comprehensive Plan EIS efforts of 1994, and applies the "planned action" approach identified in ESHB1724.



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Figure 2-1
Study Area Boundaries

The Proposed Action includes three elements:

1. A revised MIC Shoreline Master Plan, as a component of the city-wide shoreline master plan
2. An integrated subarea plan/SEPA review, which applies the "planned action" option of project-level SEPA review
3. A package of recommended regulatory revisions to remove redundant or unneeded requirements and add requirements and guidelines, as appropriate

MIC Implementation Plan Development

The city has used a systematic approach (Figure 2-2) to development of the MIC implementation plan. An initial public outreach article was sent to all residents, businesses, and property owners in Tukwila; the article was followed by a series of stakeholder outreach meetings with area property owners, staff from state and local agencies with jurisdiction over development in the MIC, and industrial development experts. These meetings helped identify the area's opportunities and constraints, as well as a preliminary list of regulatory gaps, overlaps, and potential barriers to redevelopment.

Following the public scoping period for the EIS and the stakeholder meetings, three hypothetical prototypes were developed to illustrate the range of issues likely to be raised by development proposals in the MIC.

The prototypes, described in more detail in the next section of this chapter, cover a range of permitted uses in the MIC, from warehouse and distribution, to research and development, to manufacturing and laboratory. The prototypes were tested to further clarify potential gaps and overlaps in Tukwila's codes and regulations that apply to review of development proposals. From this review, recommendations were prepared to assure that environmental safeguards are in place within the city's codes and development review procedures to address future development proposals.

Developments proposed for the MIC will be reviewed under a new planned action permit process following City Council consideration and approval of the MIC implementation plan. A pre-application review of a new proposal will evaluate its consistency with the MIC implementation plan and EIS. A project that is determined to be consistent with the subarea plan (including the MIC element, the zoning code, and the shoreline master program), and that falls generally within the range of uses and impacts identified in this EIS, will receive a consistency determination that incorporates mitigation and conditions as appropriate. A project receiving a consistency determination will be assumed to have satisfied the procedural and substantive requirements of the State Environmental Policy Act (SEPA).

The mitigation and conditions will be based on Tukwila's codes and regulations, rather than additional SEPA review. This EIS recommends modifications to the city's codes and regulations to fill gaps that may have otherwise existed in the absence of additional SEPA review.

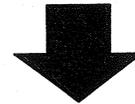
For projects that are not consistent with the subarea plan, additional environmental review at the project level will be required. Inconsistent projects will include those requiring

Notice of Plan preparation and summary goals sent to all residents businesses and property owners in the City.



Workshops with major property owners, State and Federal regulators, Muckleshoot Tribe Fisheries, and industrial development experts on MIC issues and opportunities.

Inventory existing policy direction, development regulations, development review process and other technical studies.



Evaluate the interaction of identified issues, the land use regulatory system, and MIC policy direction to validate and/or revise the basic purpose and products of the MIC Implementation Plan.



Use professional expertise to develop a representative range of proto-typical, market driven developments, which are consistent with the MIC land use designations.



Test prototype developments based on existing regulations and identify issues.



Draft revised regulations to delete unnecessary regulations and add regulations as needed to fill regulatory gaps created by early SEPA Planned Action review.



Prepare preliminary DEIS.



Review and revise proposed regulations.



FINALIZE INTEGRATED MIC IMPLEMENTATION PLAN AND SEPA DEIS

**Figure 2-2
MIC Implementation Plan
Development Process**

conditional use or unclassified use approval, or those needing changes to the MIC boundary or the MIC element of the Comprehensive Plan in order to proceed. Projects that are consistent in most, but not all, respects will require preparation of a new environmental analysis for those aspects of the proposal not studied in the original implementation plan EIS.

MIC Prototypes

The plan development process is summarized in Figure 2-2.

Figure 2-3 illustrates the locations of the three prototype sites.

Figures 2-4, 2-5, and 2-6 present the three prototypes developed for the project. The prototypes are hypothetical, but are intended to be realistic and illustrate the types of development or redevelopment likely to be proposed for properties in the MIC. The analysis presented in Chapters 3 to 6 of this EIS is corridor-wide, but uses an assessment of the three prototypes to help identify environmental impacts and needed mitigation.

Figure 2-4 illustrates Prototype Site 1, a site located at South 112th Street and Pacific Highway South. The site has river frontage and is assumed to be used for sale, distribution, and storage of industrial supplies. The redevelopment shown in Figure 2-4 is for a research and development facility with accessory office space. Issues that will be explored in Part 2 of this EIS include access to Pacific Highway, driveway number and location, and shoreline development issues.

Figure 2-5 shows Prototype Site 2. This site is located between Pacific Highway South and East Marginal Way South at South 112th Street. Current use is assumed to be auto sales and service. The redevelopment shown in the prototype is for a warehouse and distribution center. Part 2 (Chapter 5, Transportation, in particular) will explore impacts and code provisions for dealing with access to Pacific Highway and East Marginal Way South, requirements for road improvements, driveway standards, and roadway capacity.

Figure 2-6 presents Prototype Site 3. This site is at the northern end of the MIC, bounded by Sixteenth Avenue South, East Marginal Way South, and the Duwamish River. The site is actually Boeing's Plant 2 and is currently used for airplane manufacturing and assembly. While not an actual proposal, the hypothetical redevelopment shown in Figure 2-6 is a possible approach Boeing may consider for upgrading the site's facilities. It raises a number of issues that are explored in later chapters of this EIS, including large-scale demolition, driveway standards, scale of development, and redevelopment at the shoreline, including replacement of over-water structures.

Project Description

The MIC implementation plan is proposed to incorporate a number of changes to development regulations in the MIC subarea. The changes are to the zoning code, shoreline master program, and other development regulations and procedures. The most significant changes proposed are to the shoreline master program. Appendix B includes the full text of the proposed shoreline master plan program amendments. An analysis of the impacts of these changes in the MIC is included in Chapter 4 of this EIS.

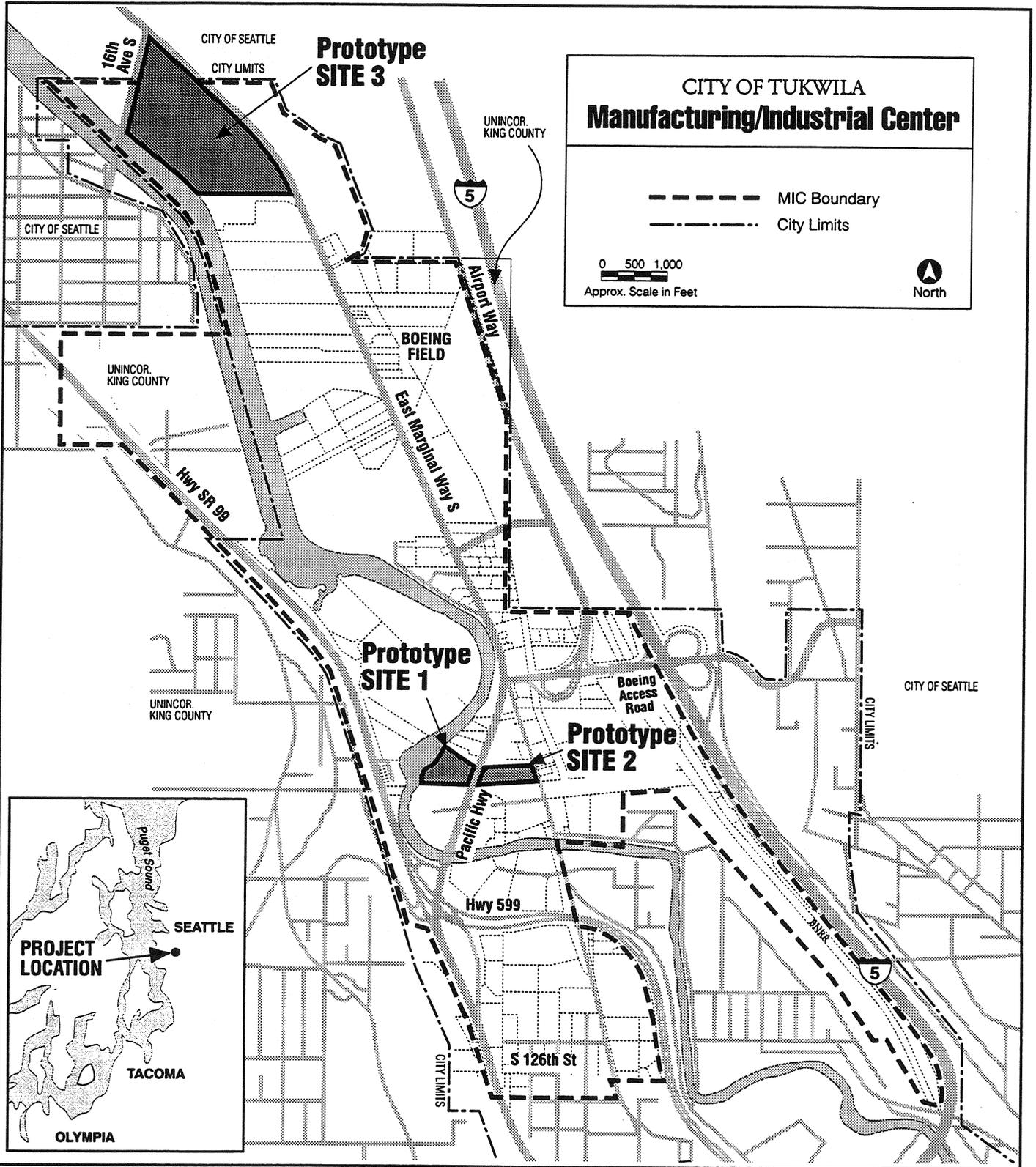
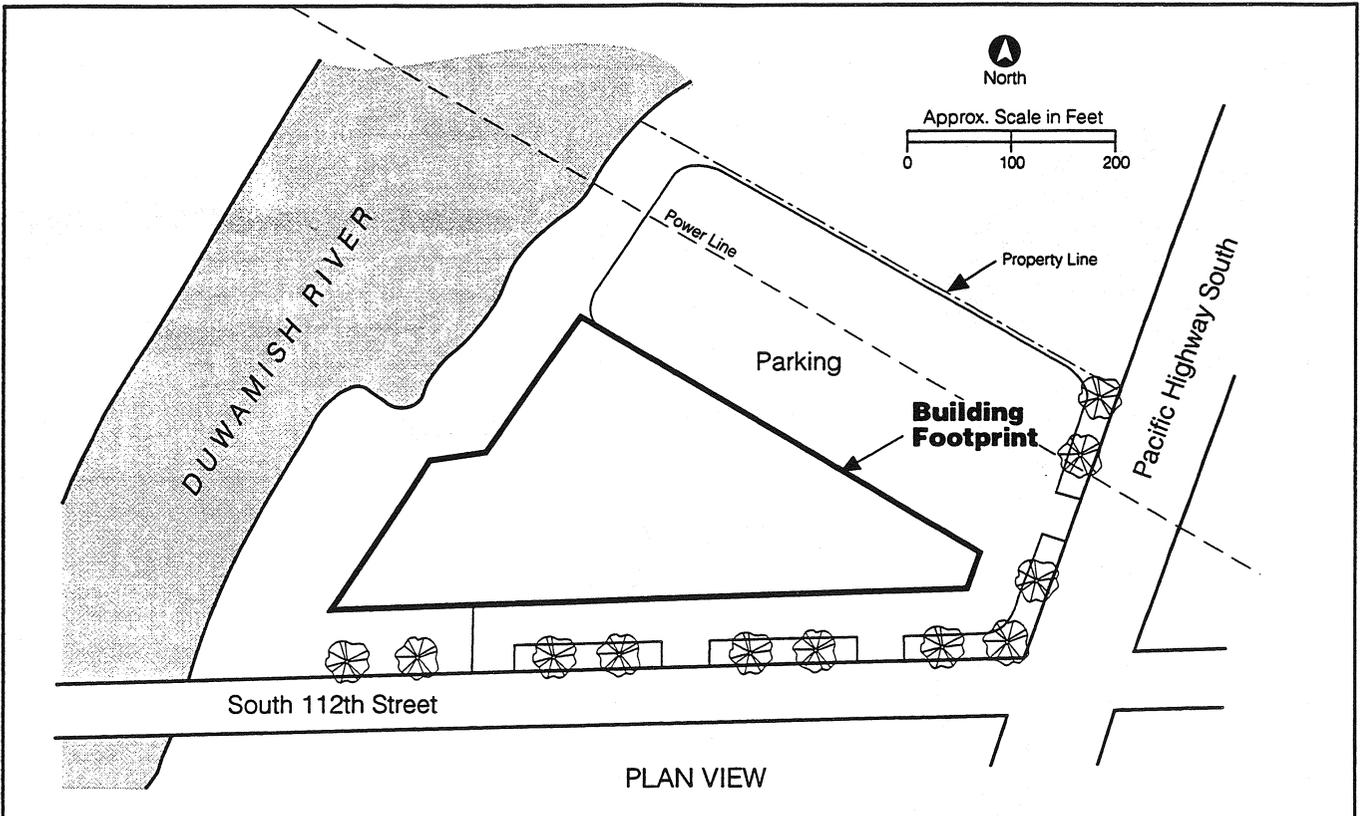
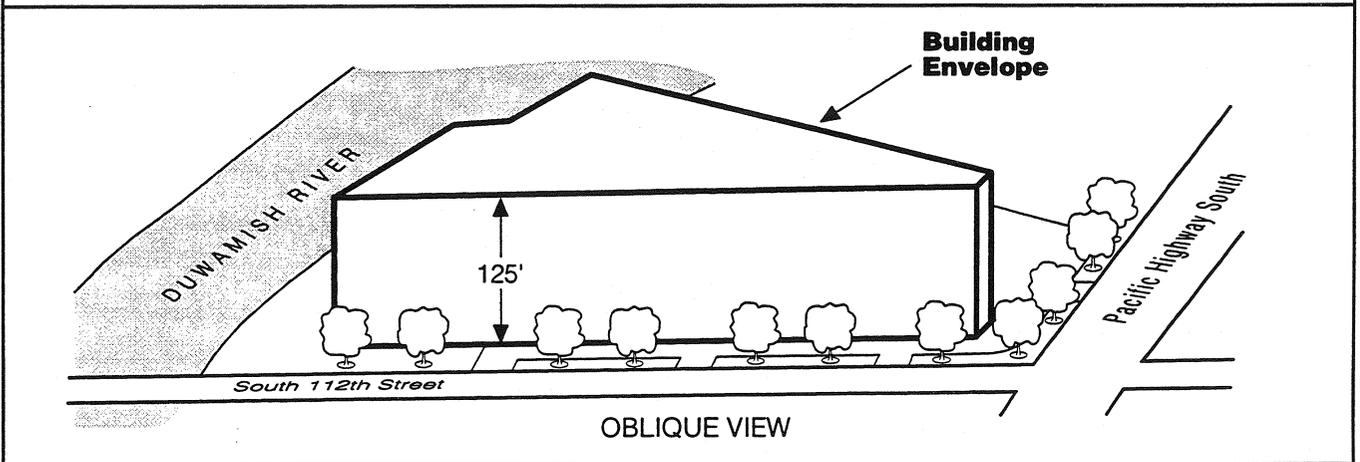


Figure 2-3
Location of Prototype Sites



PLAN VIEW



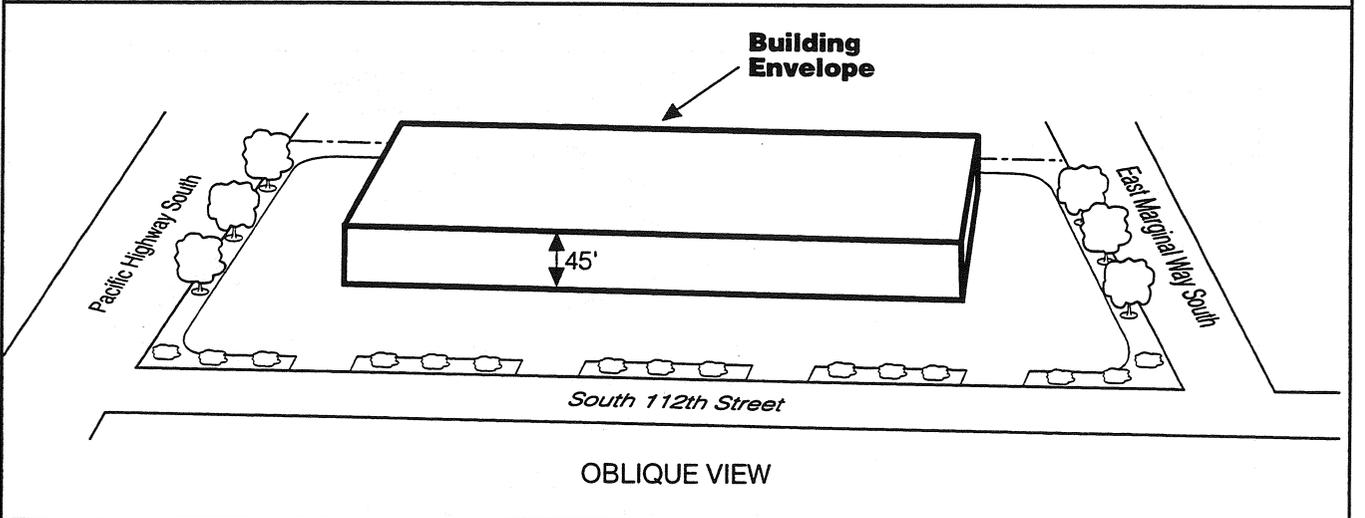
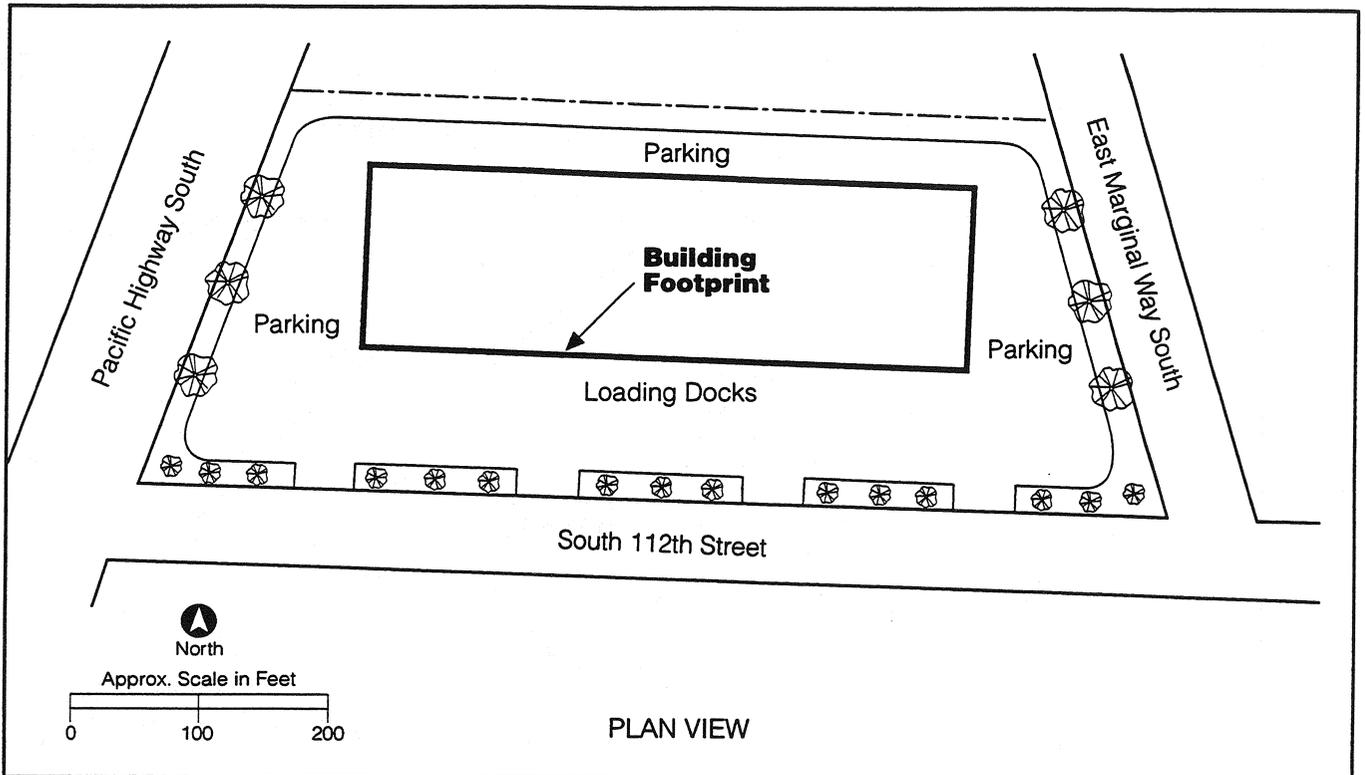
OBLIQUE VIEW

SITE DATA:

Zoning: MIC/H	Building Height: 125'	Parking Required: 437 Spaces (@ 2.5/1,000)
Site Size: 475,000 SF	Site Coverage: 100%	Parking Proposed: 525 Spaces (@ 3.0/1,000)
Building Footprint: 175,000 SF	Driveways: Number 4	
Building Uses: Office 35,000 SF	Lin. Ft. of	
R&D 70,000 SF	Curb Cuts 100	
Lab 70,000 SF		

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**Figure 2-4
Prototype Site 1**

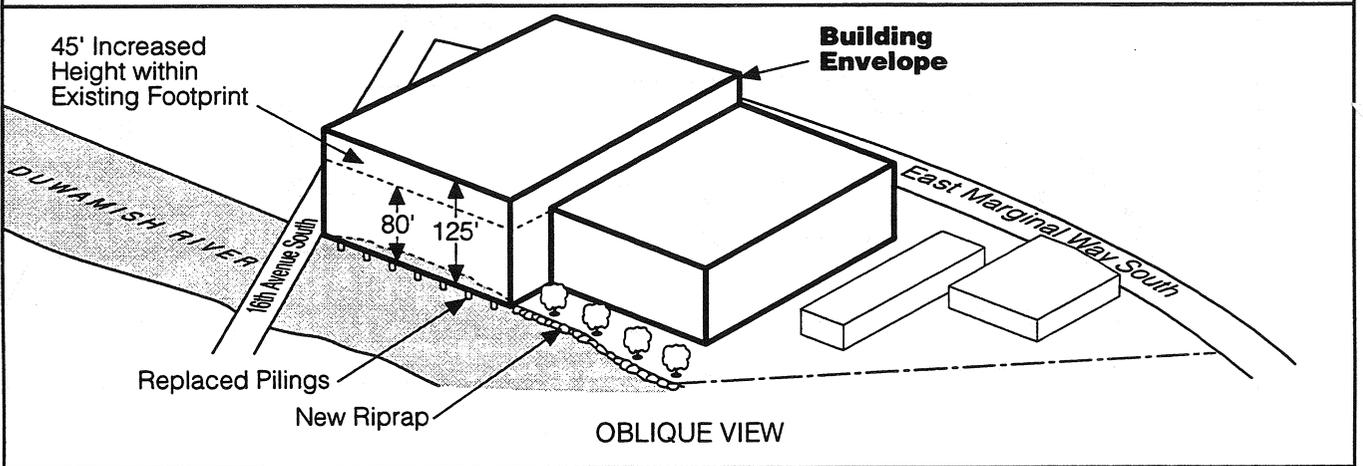
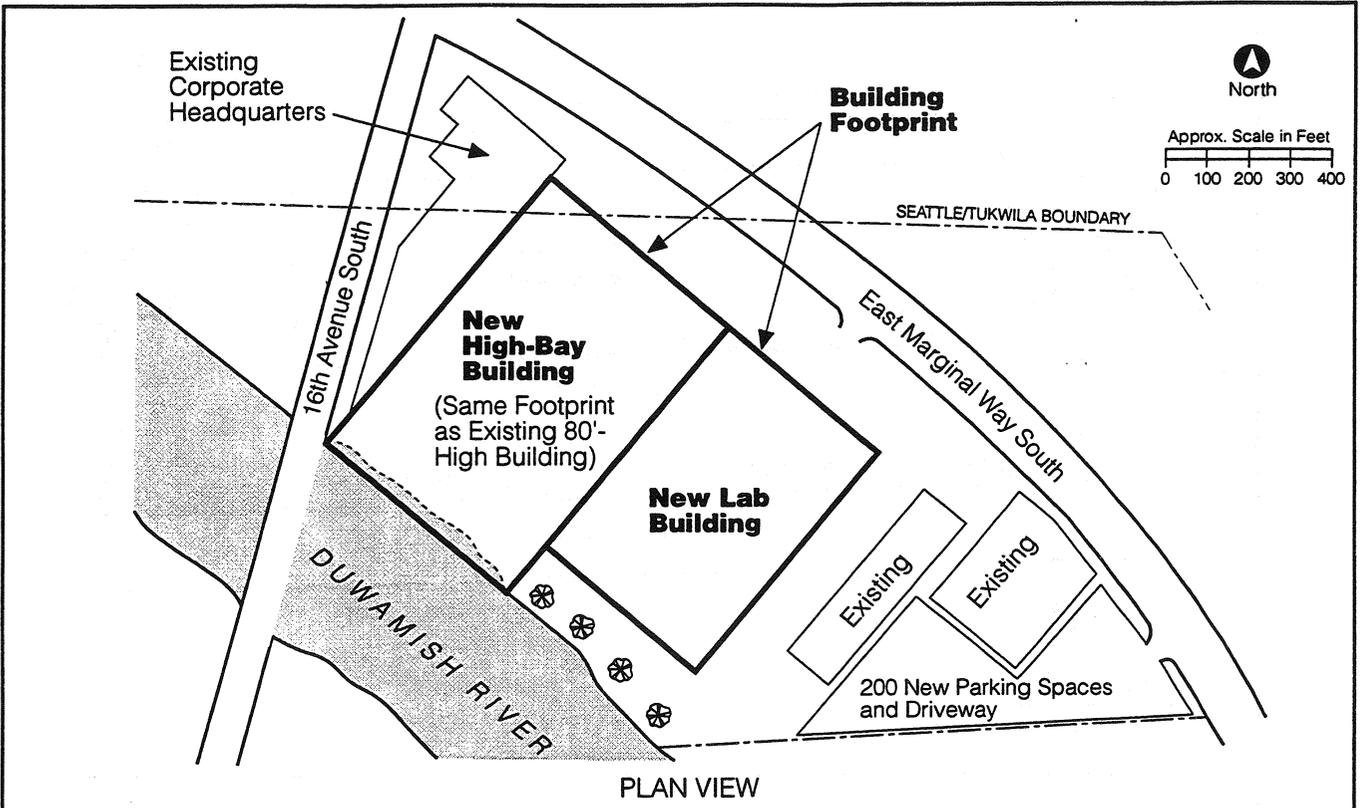


SITE DATA:

Zoning:	MIC/H	Building Height:	45'	Parking Required:	
Site Size:	210,000 SF	Site Coverage:	100%	(@ 2.5/office).....	38 Spaces
Building Footprint:	73,000 SF	Driveways: Number	4	(@ 1.5/warehouse).....	88 Spaces
Building Uses: Office	15,000 SF	Lin. Ft. of			126 Total
Warehouse/Distribution	58,500 SF	Curb Cuts.....	240	Parking Proposed:.....	135 Spaces

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**Figure 2-5
Prototype Site 2**



SITE DATA:

Zoning:.....	MIC/H	Building Height:.....	125'	Parking Required:	
Site Size:.....	50 Acres	Site Coverage:.....	100%	(@ 1/1,000).....	1,450 Spaces
Building Footprint:.....	1,450,000 SF	Driveways: Existing and 1		On-Site:.....	600
Building Uses: Highbay Mfg.:.....	750,000 SF	for New Parking		Existing:.....	400
Laboratory:.....	700,000 SF	Area		New:.....	200
				Off-Site:.....	900+

Figure 2-6
Prototype Site 3

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The provisions of the proposed Shoreline Master Plan for the MIC are summarized below.

Proposed MIC Shoreline Master Plan Provisions

The proposed Shoreline Master Plan is composed of an environment designation, development and use policies, and implementation regulations and guidelines.

Environment Designation

The shoreline zone extends 200 feet from the ordinary high water mark (OHWM) on both sides of the river.

The MIC shoreline zone is designated as "Manufacturing Industrial Center Environment" between the northern city limit and the upstream edge of the Highway 99 bridge, per Comprehensive Plan Policy 5.1.2. This is a distance of about 2.5 miles of river length. In this environment, priority shall be given to the following:

- Redevelopment of under-utilized areas and development of intensive commercial and industrial activities
- Enhancement and restoration of access to the river
- Protection and restoration of natural environment features and riverbank characteristics, where compatible with development

The Duwamish River from the upstream edge of the Highway 99 bridge southward for the remainder of the MIC is designated "Urban-Open Space Environment," per Comprehensive Plan Policy 5.1.1. This is a distance of about ½ mile of river. In this environment, priority shall be given to:

- Maintaining existing single family residential development patterns
- Redevelopment of existing commercial and industrial areas, with enhanced river access
- Protection and restoration of natural environmental features and riverbank characteristics

Development and Use Policies

Numerous policies have been incorporated into the Shoreline Master Plan. These policies are direct transfers of applicable Comprehensive Plan goals and policies. These policies are individually listed in the plan and implemented in various regulations.

Regulations and Guidelines

Regulations regarding shoreline access, habitat restoration in lieu of access, and various site development standards provide for implementation of the above policies. The shoreline regulations are summarized in Table 2-1.

The development of near shore areas has often been an area of private sector uncertainty. The shoreline plan provides illustrative, near shore development options to enhance predictability. These illustrative guidelines are presented in Appendix B.

Policies also have innate substantive authority as they relate to a shoreline substantial development permit.

The process for reviewing a shoreline substantial development permit is proposed to change. Rather than the current requirement that projects within the MIC that require a shoreline permit undergo design review by the Board of Architectural Review, the proposed action would substitute an administrative design review process. Design guidelines will be developed to provide clear direction for the administrative decision on design issues. The shoreline permit would remain appealable to the State Shorelines Hearing Board. The same process would apply to a shoreline conditional use permit. A shoreline variance would be heard by the Tukwila Board of Adjustment, with appeal to the State Shorelines Hearings Board.

Public notice for all hearings and permit decisions is subject to TMC 18.104. TMC 18.104 is consistent with the latest provisions of ESHB 1724.

Recommended Regulatory Revisions

Other proposed changes to codes and regulations that are the substantive elements of the MIC implementation plan are summarized in Table 2-2 at the end of this chapter. These regulatory revisions have been proposed based on the analysis of prototypes, issues raised in outreach workshops, interdepartmental and interagency discussions, and other analyses and data sources. They are proposed to increase the predictability of case-by-case decision-making, fill any gaps resulting from the use of the planned action option of ESHB1724, and remove unnecessary regulatory barriers to development. While Table 2-2 summarizes the nature of substantial regulatory revisions, codified language will be prepared following public review as part of a final proposal for planned action ordinance to be referred to the Planning Commission and City Council

Actions Outside the Scope of This MIC Implementation Plan and Planned Action Ordinances

As has been previously noted, not all actions are covered by the proposed planned action approach for the MIC. Some potential development proposals present too high a level of impact variability at this subarea planning stage, or too high a level of uncertainty. A summary of "excluded actions" is provided below. Excluded actions will be required to undergo additional project-level SEPA review at the time of permit application.

A number of transportation issues affect redevelopment in the MIC. For example, studies for the Regional Transit Authority (RTA) have, on a preliminary basis, identified the MIC as a potential location for such RTA facilities as a rail maintenance yard and an intermodal station. The analysis in this EIS has not addressed these preliminary plans, which could have significant implications for the MIC, for Tukwila, and for the region. Tukwila fully expects to be a participant in discussions with the RTA as the RTA plan is refined in the coming months. RTA projects are not included in the MIC implementation plan. A related issue is the Burlington Northern/Santa Fe Railroad facility located at the southeast corner of the MIC. Both railroad freight yards and regional transit facilities are unclassified uses in the Zoning Code. These uses are subject to City Council approval and will continue to require project-level SEPA review.

The Sixteenth Avenue South Bridge is located at the northern boundary of the MIC. The current boundary between King County and the City of Tukwila is in the middle of the river at this location, so half of the bridge is in Tukwila and half in King County. Responsibilities and costs for operating and maintaining this facility are currently split by the two jurisdictions. Because the condition of the bridge is poor, replacement or closure will be necessary relatively soon. Appropriate shared responsibilities for potential replacement costs have not been determined. The city is now preparing an origin and destination study to evaluate its fair share responsibility for the bridge. This issue will be resolved later, once the origin and destination study is completed and other analyses have been considered. The MIC implementation plan EIS does not attempt to resolve this issue.

The MIC implementation plan EIS uses the MIC boundaries adopted by the Tukwila City Council for its comprehensive plan. Small portions of the MIC lie outside the boundaries of the City of Tukwila. Annexations or boundary adjustments with adjacent jurisdictions are not proposed as part of the MIC implementation plan. It is assumed that those processes will continue independently.

Additional excluded actions include all proposals requiring conditional use or unclassified use approval. Also, because of the need for individual, site-by-site review of habitat issues raised by proposals to modify the bank of the river, those portions of a proposal that include modifications to the shoreline waterward of the ordinary high water line are excluded actions and will be required to undergo additional SEPA review. On the other hand, proposals for redevelopment along shorelines already developed with rip-rap, sheet piling, or bulkheads will be permitted under the proposed action without additional SEPA review. New sheet piling or bulkheading where not currently in place will be permitted, however, only with further SEPA review and consistency with the Shoreline Master Plan.

Some uncertainty exists as to the ultimate nature of full buildout of the MIC. In 1992, The Boeing Company proposed its Duwamish Corridor master plan. Tukwila prepared an area-wide EIS on the plan, and the city and Boeing negotiated a mitigation agreement to address impacts of redevelopment along the corridor. Recent corporate mergers and acquisitions have resulted in a degree of uncertainty about the applicability of the earlier master plan and the ultimate role of the Duwamish Corridor as an employment and manufacturing center for Boeing. The corridor has been cyclical in employment density throughout the 50 plus years of its industrial history, and the proposed implementation plan anticipates that that trend may well continue. The city's intent in pursuing the MIC implementation plan is less to provide a specific physical plan for the MIC than to help facilitate its vision of the corridor as a world-class industrial center, capitalizing on the availability of its infrastructure and incorporating environmental protection into development standards for the variety of uses that together make this subarea such an important regional resource.

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TABLE 2-1
Summary of Proposed MIC Shoreline Regulations

Use Type	River Setback	Other Setback	Height	Landscaping	Impervious Surface	Public Access	Shoreline Stabilization	Overwater
Water Dependent (uses that are dependent upon water location to exist)	None	Zone District	Zone District	Zone District	No standard.	Not required.	Vertical bulkheads allowed upland of OHWM.	Allowed if not detrimental to navigation and habitat restored at a 1:1 ratio.
Water Related/Enjoyment (uses that cannot occur economically without a shoreline location or provide substantial opportunity for water enjoyment)	40 feet	Zone District	Zone District	Zone District & 10' *** along edge of 40' river environment.	No net increase in the 40' river environment except mitigated shoreline stabilization.*	Generally required. Habitat restoration may be substituted.**	Vertical bulkheads not allowed. Stabilization projects must improve habitat.	No
Non-Water Related	60 feet	Zone District	Zone District	Zone District & 10'*** along edge of 40' river environment.	No net increase in the 40' river environment except mitigated shoreline stabilization.*	Generally required. Habitat restoration may be substituted.**	Vertical bulkheads not allowed. Stabilization projects must improve habitat.	No
Redevelopment	No setback if redevelopment does not expand horizontally within river environment.	Zone District	Zone District	Zone district & where possible 10'*** along edge of 40' river environment.	No net increase in 40' river environment except mitigated shoreline stabilization.*	Generally required. Habitat restoration may be substituted.**	No new vertical bulkhead. Reconstruction OK when it extends no farther into river. New stabilization projects must improve habitat.	OK if redevelopment remains within the existing overwater footprint.

*Some exceptions will apply such as public roads, utility facilities, and trails.
 **See general standards for situations in which access is and is not required.
 *** Half of the 10 feet of landscaping may be located in the river environment.

TABLE 2-2

Proposed Changes to Codes and Regulations Implementing the MIC Implementation Plan

Element of Environment	Regulatory Gap/Overlap	Proposed or Recommended New Regulation
Land Use		
Lighting	Requirements are not specific.	Specify lighting standards of 2 foot-candles maximum at property line with light element shielded and recessed to eliminate direct offsite illumination.
Landscaping	No special standards for landscaping.	Require large stature trees at 35 feet on center along front yard landscape areas. DCD may modify this criterion at specific sites for safety purposes or to avoid significant adverse impacts.
Design Review	Design review for MIC is required within the shoreline overlay. Adds time and complexity to the permitting process, in an area that is basically an industrial zone.	Allow administrative design review based on clear design guidelines, for projects within the Shoreline Overlay District, when design review would not otherwise be required.
Shoreline		
Tukwila Shoreline Overlay	Old King County code is being applied to MIC; not consistent with shoreline goals of city comprehensive plan or the city's shoreline master program approved by DOE.	Revise shoreline master program to be consistent with city comprehensive plan, Shoreline Policies, including specific regulations and design guidelines for MIC. See Table 2-1 and Appendix B.
Transportation		
Thresholds; mitigation for traffic impacts	Concurrency ordinance requires impact mitigation fees for projects generating more than 5 peak-hour trips to fund facilities in the Transportation Plan. All anticipated MIC facilities have been funded. No further fees are required.	Require SEPA review for proposed projects that will increase delays by more than 30 seconds at the intersections of S. 112th Street with Pacific Highway S. and East Marginal Way S.
Guidelines for site-specific studies	No authority outside of SEPA for driveway design and location.	Guidelines proposed to be included in construction design standards.
Driveway standards	Guidelines now in the Zoning Code are inadequate to regulate driveway design and location.	Amend concurrency ordinance to specify that traffic study address driveway standards of number, width, distance from adjacent intersections and other driveways, and alignment with driveways across street. Prototype standards are shown in Figure 5-12.

TABLE 2-2

Proposed Changes to Codes and Regulations Implementing the MIC Implementation Plan

Element of Environment	Regulatory Gap/Overlap	Proposed or Recommended New Regulation
Hydrology and Water Quality		
Stormwater	The stormwater management ordinance covers commercial properties, but does not specify coverage of industrial properties (though that is clearly intended).	Clarify that the stormwater regulations apply to industrial development.
Water Quality	Sewer Infrastructure design standards state that pretreatment, special flow metering or sampling may be required, but no standards are in place.	Clarify that King County industrial wastewater control standards and authority apply.
Hazardous Materials		
Handling, storage, generation	Federal and state standards apply.	No change.
Air		
Point sources	Federal, state, and regional Puget Sound Air Pollution Control Authority (PSAPCA) regulations apply.	No change.
SEPA		
	No process in place for handling development proposals within a subarea with a plan and an EIS adopted by an implementation plan ordinance.	Adopt process for establishing that development proposal is consistent with subarea plan and environmental analysis.

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Land Use

Existing Conditions

Project Area Land Uses

The Tukwila MIC comprises approximately 1,000 acres of land in the northern portion of the city. Its general boundaries are the City of Seattle to the north, 125th Street to the south, the BNSF right-of-way to the east, and the Duwamish River to the west (see Figure 2-1). Designated as an MIC under the provisions of King County's countywide planning policies (CPPs), the corridor has a long history of these types of uses; the designation reflects the MIC's importance in the regional economy as one of the few remaining concentrations of manufacturing and industrial lands in urban Puget Sound.

The general distribution of land uses in the MIC is shown in Table 3-1 and Figure 3-1. The dominant landholder is the Boeing Company, which owns or controls approximately 75 percent (750 acres) of land within the corridor. Boeing's facilities include a mix of manufacturing, office, laboratory, research and development, and related uses, as well as the company's administrative headquarters. Other land uses in the MIC include light and heavy manufacturing, warehousing, processing services, public and quasi-public uses, and various commercial and service establishments oriented toward corridor employees and travelers on the major arterials. Less than 10 percent of the MIC (approximately 80 acres) is vacant land; approximately 70 percent is built out, with the balance of land area occupied by the river and by various rights-of-way (Table 3-1). This high level of development reflects the area's history as a center for industry and commerce.

TABLE 3-1
Land Use Distribution in the Tukwila MIC

Use Type	Acres	Percent of Total
Developed land	693	70
Airport	175	17
Vacant land	80	8
Water	34	3
Rights-of-way	16	2

The other significant land use in the MIC is the King County Airport (Boeing Field), which serves Boeing Company and other aircraft. The southern third of the airport occupies about 175 acres in the northern portion of the MIC and includes a number of businesses on land leased from the airport. The facility's use and development are guided by a master plan,

MANUFACTURING INDUSTRIAL CENTER IMPLEMENTATION PLAN

City of Tukwila

-  Agriculture
-  Public Recreation
-  Public Services
-  Quasi-Public
-  Wholesale Distribution
-  Retail Distribution
-  Commercial Services
-  Processing/Industrial
-  Multi-Family
-  Single Family
-  Vacant
-  Water Areas
-  Miscellaneous

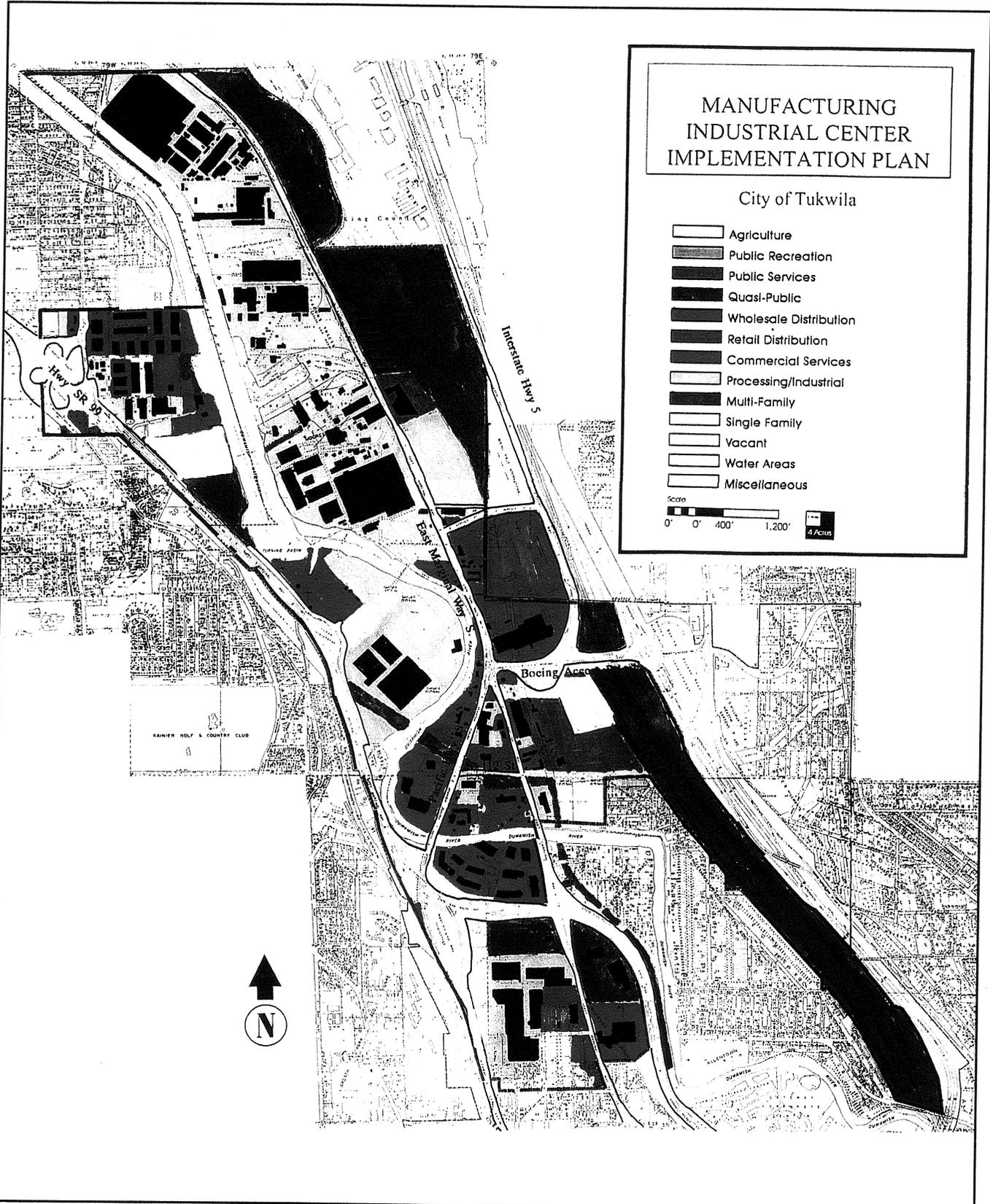
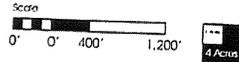


Figure 3-1
Existing MIC Land Uses



which is being updated (see "Future Land Use" and "Relationship to Land Use Plans and Policies" below). In addition to tenants of its leased lands, the airport also influences land uses in the surrounding area by imposing FAA-mandated height restrictions on buildings within the flight path. These restrictions are also discussed below.

Land Use at Prototype Sites

As described in Chapter 2, the three prototype sites used for analysis in this EIS were chosen because they represented the variety of development and redevelopment possibilities present in the MIC. All three sites are currently developed to some degree, reflecting the highly developed nature of the area. Figure 2-1 shows the sites and their relationship to the MIC as a whole. All of the sites are in the MIC/H zone, which is designed to accommodate the heavier manufacturing and industrial uses found in the corridor as well as the lighter industrial uses allowed in the MIC/L zone.

Prototype Site 1 is located in the southern portion of the MIC along the Duwamish River, north of the Boeing Customer Service Center. It is bounded on the north by the northern edge of the Seattle City Light transmission right-of-way, on the south by South 112th Street, on the west by the river, and on the east by East Marginal Way South. Access is from South 112th Street (which in this area is on an easement from the Seattle Water Department to the City of Tukwila) and from East Marginal Way. Encompassing approximately 11 acres, the site includes several parcels and is occupied by a number of businesses, including a restaurant equipment distributor, an electrical equipment repair company, a brewery, and a commercial truck dealer; the City Light transmission line right-of-way occupies about 3 acres of the site's total area. Overall, the site can currently be characterized as somewhat underutilized; for example, an area along the shoreline north of South 112th Street is being used for pallet storage. The new Green River Trail pedestrian bridge crosses the river just south of the site, but no access to the shoreline (except visual access from the bridge) is available on the site itself.

Prototype Site 2 is across East Marginal Way from Prototype Site 1. It is bounded by private property on the north, South 112th Street on the south, East Marginal Way on the east, and Pacific Highway South on the west. The site is approximately 5 acres in size and is currently occupied by a car and truck dealership. Access is from South 112th Street, East Marginal Way, and Pacific Highway South.

Prototype Site 3 is the 50-acre Boeing Plant 2 site, located at the northern city limits and including a small area within the City of Seattle. Its boundaries are 16th Avenue South on the north, Jorgenson Steel on the south, the Duwamish Waterway on the west, and East Marginal Way on the east; access is from East Marginal Way. A number of buildings housing manufacturing, industrial, and other Boeing Company uses, including the company's administrative headquarters, are located on the site. A building at the north end of the site extends about 45 feet over the Duwamish Waterway on pilings. As with Prototype Site 1, there is no public access to the shoreline.

Future Project Area Land Uses

Future land use in the MIC is guided by its designation for continued manufacturing and industrial activities in the CPPs and the Tukwila Comprehensive Plan. As described below under "Relationship to Land Use Plans and Policies," current planning and zoning envision

uses and densities generally similar to those now in place, although underdeveloped sites may transition toward more intense uses allowed under applicable codes. As discussed in Chapter 2, proposals consistent with the codes and falling within the range of impacts analyzed in this EIS will be allowed to develop under a streamlined approval process. Proposals outside these thresholds (in general, those requiring conditional or unclassified use approvals) may be subject to additional review requirements under SEPA, as well as to approval by the city's hearing examiner and, for unclassified use permits, the City Council.

Within the framework described above, the primary determinant of future land use in the MIC will be the Boeing Company's activities in its Duwamish Corridor facilities. In 1992, Boeing published a plan for redevelopment of its facilities in the corridor from predominantly manufacturing uses to an aerospace research and development engineering campus with office, laboratory, and assembly space for full-scale aircraft prototypes. The city prepared a programmatic EIS addressing impacts from such a redevelopment. To date, economic conditions in Boeing's markets have not supported this full-scale redevelopment (see "Employment" below), and the company's recent mergers and acquisitions pose further uncertainties regarding actions to be taken under the 1992 plan. Nevertheless, it is likely that future development of Boeing properties in the corridor would be consistent with the nature of the existing facilities and with overall MIC permitted uses.

The potential also exists for redevelopment of leased properties at the King County Airport. Use of the airport property is guided by a master plan that is currently being updated. Redevelopment possibilities under the plan are discussed below under "Relationship to Land Use Plans and Policies."

Employment

Employment levels over the history of the Tukwila MIC have historically been cyclical, influenced strongly by the fortunes of the Boeing Company and nearby supporting industries. Boeing employment in the corridor was as high as 40,000 during the war effort of the 1940s, and dipped to well below existing levels during the "bust" of the 1970s. The 1992 Boeing Duwamish Corridor Redevelopment EIS showed 1991 employment at 21,400, with a projected maximum of 25,000 employees by the planning horizon of 2002. However, actual levels since 1992 have been much lower as a result of changing economic conditions. Boeing has estimated 1993 Duwamish Corridor employment at 14,000 to 15,000, increasing to between 16,000 and 17,000 by 1997. Overall MIC employment was estimated in the 1995 Tukwila Comprehensive Plan at approximately 18,000. Recent business license data suggest that, with the increased Boeing activity in the corridor, the overall total has risen to approximately 21,000. Table 3-2 shows the general distribution of employment in the corridor in 1995.

TABLE 3-2
1995 Employment Distribution in the Tukwila MIC

Employment Type	Number of Employees	Percent of Total
Manufacturing/processing	13,845	76
Professional/office	1,887	10
Wholesale	1,644	9
Retail	362	2
Other	453	3

Current Plans, Policies, and Regulations

This section provides a discussion of the applicable land use plans, policies, zoning regulations, and other regulatory constraints that apply to development in the MIC. Shoreline master program requirements and other regulations related to aquatic resources are discussed in Chapter 4, Shoreline Use. Plans and policies related to transportation are addressed in Chapter 5.

In general, both existing conditions and the MIC implementation plan are consistent with the applicable plans, policies, and codes. The overall intent of the MIC designation and the zoning that implements it is to facilitate the area's continued use for historical purposes by streamlining approvals for appropriate and consistent development, while maintaining desired levels of environmental and neighborhood protection and providing necessary urban services. The analysis presented in this EIS is designed to identify and fill any gaps in the existing regulatory framework for MIC project review, as well as to develop any needed linkages to the plans and regulations of other jurisdictions.

City of Tukwila

Tukwila Comprehensive Plan (1995)

The MIC is designated as a subarea of the Tukwila Comprehensive Land Use Plan. This document is the plan and EIS for that subarea. The subarea has two zoning designations. The MIC/L is to contain distributive and light manufacturing uses, with supportive commercial and offices uses. The MIC/H is to contain distributive, light manufacturing and heavy manufacturing uses, with supportive commercial and office uses. Most of the MIC is zoned MIC/H. The three prototype developments used as the basis for this EIS are all located in the MIC/H zone, although they represent some uses also found in the MIC/L zone.

The Plan's MIC goal is as follows:

Support for existing industrial activities in the Manufacturing/Industrial Center and development of new industrial activity in order to maximize the employment and economic benefits to the people of Tukwila and the region, while minimizing impacts on residential neighborhoods.(Goal 11.1)

The MIC policies are designed to help realize full revenue and employment potential. The goal of this subarea plan and EIS, to remove regulatory barriers to redevelopment in the MIC by providing predictable development standards and shortening permit review time, is the subject of one of the policies (11.1.3). In addition, Policy 11.1.4 calls for tailoring the MIC shoreline requirements for the zone. This, too, is accomplished through the shoreline proposals in this EIS. Finally, MIC Policy 11.1.10 calls for making appropriate adjustments to the boundaries between Tukwila, King County, and Seattle to eliminate confusion to industrial property owners whose properties are split between two jurisdictions. As discussed in Chapter 2, revisions to city boundaries are not part of the MIC implementation plan.

In addition to the plan element dedicated to the MIC, a number of other plan elements have goals, policies, and implementation strategies which affect the MIC. These include the economic development, shoreline, annexation, and transportation elements.

The economic development element approach is as follows:

- Sustain moderate growth.
- Target high salary industries.
- Ensure quality growth and land use by effective code enforcement and regulations.
- Encourage growth into certain areas through the use of zoning and developmental regulations.
- Encourage the retention and growth of existing local firms.
- Provide efficient and timely administration of City services (Plan, p.31).

Economic Development Policy 2.1.13 is as follows:

Include standards in the development regulations for industrial uses which adequately mitigate potential adverse impacts on surrounding properties and public facilities and services.

The MIC implementation plan and EIS will propose such standards.

The annexation element contains discussion of boundary anomalies which create a number of jurisdictional issues, including police response and complicated permit processes when one property or even one building lies in two jurisdictions. Properties in the MIC which are affected include Boeing's Plant 2, where the northernmost corner of the building is in Seattle, King County International Airport, which is in both Seattle and Tukwila, and the Associated Grocers property, which is also bisected by the Seattle-Tukwila boundary. Annexation Goal 6.1 calls for a logical and serviceable municipal boundary, and Policy 6.1.4 calls for working with the affected property owners and neighboring cities to develop interlocal agreements providing for processes to adjust the border anomalies. Policy 11.1.10 of the MIC element suggests a trade of territory so that 16th Avenue South becomes the city boundary between East Marginal Way and the river.

The transportation element of the plan establishes level-of-service (LOS) requirements for the city's streets and arterials, as well as policies regarding transit use and rideshare

measures. The relationship of the implementation plan to Tukwila and regional transportation plans and regulations is discussed in Chapter 5 of this EIS.

Tukwila Zoning Code

The MIC encompasses two zoning designations: the MIC/L and the MIC/H districts. These districts and their requirements are described in Chapters 18.36 and 18.38, respectively, of the Tukwila Zoning Code. The MIC/L zone is designed to provide "a major employment area containing distributive, light manufacturing, and industrial uses and other uses that support those industries." The MIC/H zone is similar in nature, but also allows for heavy or bulk manufacturing and industrial uses. Both districts' uses and standards are intended to enhance the redevelopment of the Duwamish Corridor. Table 3-3 summarizes performance standards for the two zoning districts; Figure 3-2 shows their distribution across the MIC. By definition, the implementation plan and the prototype sites conform to all requirements of the MIC zoning districts.

TABLE 3-3
Development Standards for MIC Zoning Districts

Standard	MIC/L Requirement	MIC/H Requirement
Maximum height	45 feet	125 feet
Minimum setbacks ^a		
Front	20 feet	20 feet
Second front	10 feet	10 feet
Sides	None	None
Rear	None	None
Landscape requirements ^a		
Fronts	5 feet	5 feet
Sides	None	None
Rear	None	None
Minimum off-street parking ^b		
Office	2.5	2.5
Retail	2.5	2.5
Warehouse/Industrial	1	1

^aFor development not adjacent to residentially zoned properties; see zoning code for applicable standards.

^bSpaces per 1,000 gross square feet of building floor area.

A wide variety of uses is permitted in the two zones. For the MIC/L district, these include service industries and retail service establishments; high-tech uses; warehouse storage; enclosed salvage and wrecking operations; and manufacturing, processing, and assembling or packaging of electrical or mechanical equipment, previously prepared metals, food and pharmaceutical products, and electronic, mechanical, or precision instruments. Office uses are permitted if associated with another permitted use. Other uses may be permitted if the Director of the Department of Community Development determines that they are

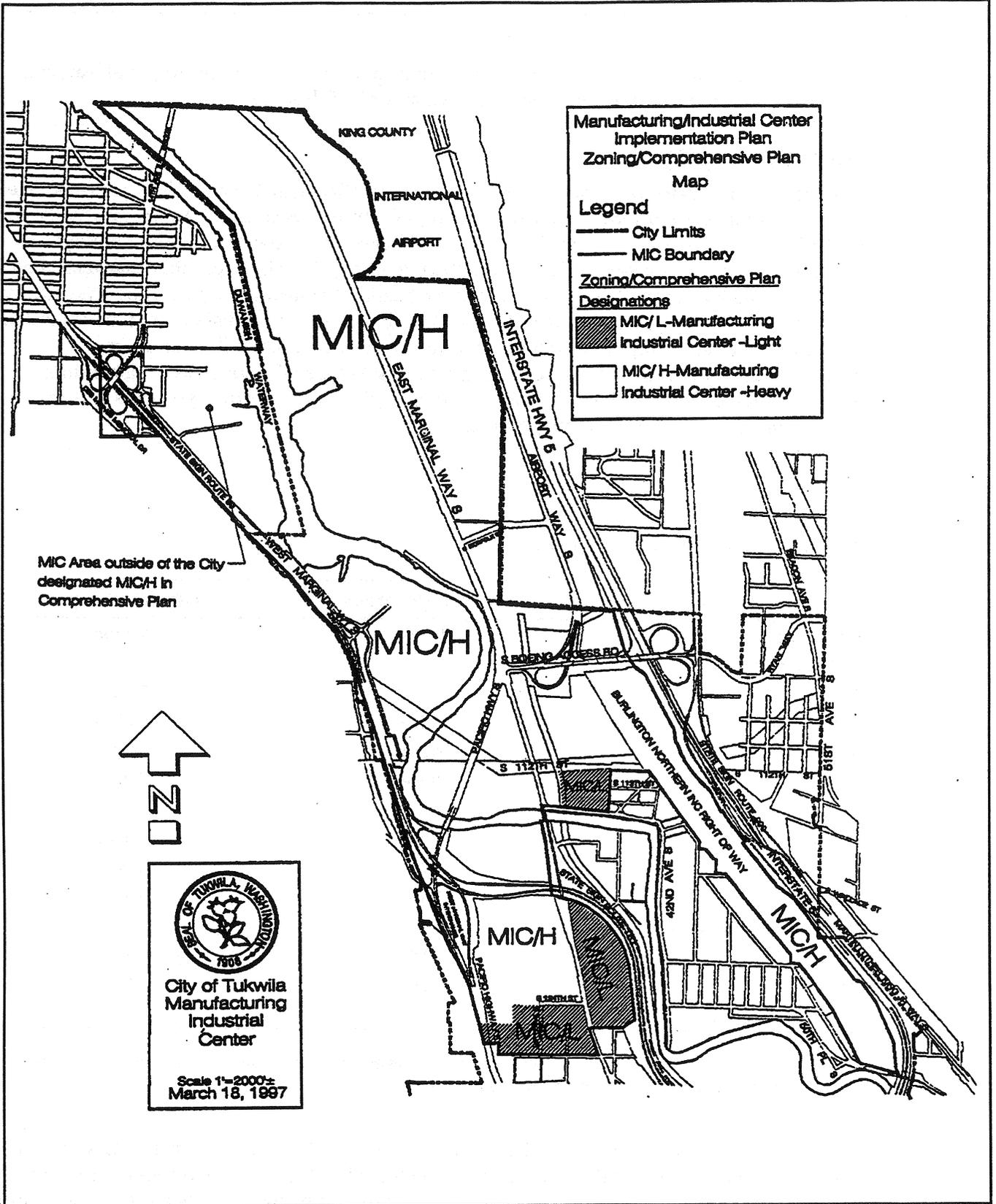


Figure 3-2
MIC Zoning District Distribution

compatible with other permitted uses, the goals of the MIC/L district, and the policies of the comprehensive plan.

Uses in the MIC/H district include all those permitted in the MIC/L district, as well as a number of more intensive manufacturing uses. Among the latter are heavy metal processes such as smelting, blast furnaces, and drop forging; the manufacture of chemicals, light metals, plastics, solvents, and other materials; iron and steel fabrication and similar metal processing operations; and rock crushing and batching or mixing of asphalt or concrete. As with the MIC/L district, offices must be associated with other permitted uses, and uses not listed may be permitted if deemed compatible with the purposes of the district and the intent of the comprehensive plan policies.

Both zoning districts include provisions for conditional use and unclassified use permits, enabling additional levels of review for uses with unusually high levels of impact or those that may not be consistent with the intent of the zone. Conditional use permits require review through a hearing examiner process, while unclassified use permits must be approved by both the hearing examiner and the City Council. Conditional uses in the MIC/L district include a number of heavier manufacturing uses permitted outright in the MIC/H district; both districts identify certain public facilities and utilities as conditional uses, as well as retail sales establishments intended to serve users from outside the MIC. Unclassified uses are similar for both zones and include such high-intensity development as airports, cement manufacturing, essential public facilities, electric generating plants, landfills and transfer stations, mining, railroad freight yards, and regional transit centers. As described in Chapter 2, the process for development review under the implementation plan would generally identify proposals for such uses as being outside the threshold of this subarea SEPA review. Such proposals would require a separate or supplemental SEPA process in conjunction with the conditional or unclassified use permit approval.

Another level of review and environmental protection for projects in the shoreline area is the shoreline overlay zoning district (Chapter 18.44 of the Tukwila Municipal Code), which regulates development within those areas under the jurisdiction of the Shoreline Management Act of 1971. Within the MIC, the regulations of this district apply to developments within 200 feet of the ordinary high water mark of the Duwamish River. Requirements of the shoreline overlay district, as well as other plans, policies, and regulations affecting development in and along the river, are discussed in Chapter 4 of this EIS.

Other Jurisdictions

King County Countywide Planning Policies

The King County Countywide Planning Policies were developed under the requirements of the 1990 Washington State Growth Management Act that counties provide framework policies to establish a regional context for planning by local jurisdictions. The 1995 Tukwila Comprehensive Plan and EIS provide a detailed description of the plan's consistency with these policies and the guiding requirements of the Growth Management Act. Several key policies of particular relevance for the MIC subarea are discussed in this section.

Policy LU-51-62: This policy designates four manufacturing/industrial centers within King County, each of which is to accommodate a minimum of 10,000 jobs (15,000 if the center is served by high-capacity transit). The Tukwila MIC is one of the four designated centers. As noted above, the corridor is currently estimated to accommodate about 21,000 jobs, which is

fewer than the historical peak, but still well above the mandated level. Although the locations of high-capacity transit lines and stations included in the current RTA system plan have not been finalized, it appears likely that employment in the corridor will also continue to exceed the policy's minimum employment threshold for MICs served by high-capacity transit.

Policy LU-28-30: This policy requires that municipalities direct growth first to centers and urbanized areas with existing infrastructure capacity, second to areas that can be serviced easily, and last to areas needing major improvements. The implementation plan is entirely consistent with this policy. By facilitating development within the MIC consistent with adopted plans and zoning, it ensures optimum use of an existing center with a history of similarly intense land uses and a highly developed urban infrastructure to support them.

Policies FW-33-36 and ED-1-24: These policies direct local comprehensive plans to support retention and expansion of the regional economic base, including policies that promote local job retention and attraction and achievement of a balance between economic growth and environmental protection. The MIC's facilitation of consistent development, as described above, will have a positive impact on the regional economy by encouraging the retention of jobs—particularly at Boeing, which has a substantial indirect economic impact—and creating the potential for new jobs through infill or redevelopment along the corridor. Concentration of intensive land uses in a designated area, along with enforcement of existing environmental regulations and the mitigation proposed in this EIS, will ensure that economic development proceeds in harmony with the City's goals for stewardship of the natural and built environments.

King County Airport Master Plan

The adopted Master Development Plan for Boeing Field/King County International Airport was completed in 1987. The plan addresses the needs of the airport over a 20-year planning period and recommends appropriate uses of the airport's property and facilities. It focuses on highest and best use of airport properties, valuation methodologies for establishing lease rates, and the environmental impacts of airport development on adjacent residential areas.

Because of changes in the types of services provided at the airport, a master plan update process was recently initiated to guide airport development. Planning efforts to date have included a field inventory, a 20-year forecast for the airport, and the development of five conceptual alternatives for use of the facility. None of the five alternatives would expand the airport footprint, and major redevelopment is unlikely; the existing mix of uses would remain essentially the same. No new infrastructure (e.g., drainage, tank farms, or utilities) is proposed. Although environmental review has not been completed, substantial increases in truck or airplane traffic, noise, or requirements for public utilities and services are not anticipated. The draft plan is proposed for issuance in summer 1997, with a preferred alternative to be selected by the King County Council in September.

FAA Airport Height Restrictions

Also associated with the King County Airport is a set of restrictions on nearby building heights mandated by the Federal Aviation Administration (FAA) to ensure safe and unobstructed takeoff and landing approach paths. The FAA regulations identify an allowable "slope" of building heights within a certain distance of the runway; the distance at which these restrictions end is determined by the area's location with respect to the takeoff and

landing pathway. For example, a slope of 50 horizontal to 1 vertical is mandated 200 feet from the runway end. Structures are permitted to exceed the established limits if the following conditions are met:

- The FAA determines that the height does not create a hazard to aviation.
- The additional height is necessary for the successful physical function of the structure.
- The exception does not require rerouting of aircraft.
- The structure is designed to minimize adverse lighting impacts, while complying with FAA lighting requirements.

Currently, airport height restrictions within Tukwila are negotiated individually for each development proposal. Some jurisdictions, however, have established formal mechanisms, such as airport height overlay districts, to provide consistency and predictability for airport operators and developers. As a mitigation measure, Tukwila may develop and adopt a system for advising developers of the height restrictions and notifying airport planners when a potential impact is identified.

Direct Land Use Impacts

This section describes changes in land use that would take place under the three prototype projects for the MIC implementation plan. These changes can generally be described as development or redevelopment that is consistent with existing planning and zoning for the area. After the prototype site discussion, the overall implications of the implementation plan for land use in the corridor are addressed. Issues raised by the prototype sites with respect to shoreline plans and regulations are discussed in Chapter 4 of this document.

Prototype Site 1

As described in Chapter 2, this prototype site illustrates a 175,000-square-foot development of mixed research/development, office, and laboratory space. Existing structures on the site would be demolished and replaced with a single building to house these uses. A total of 525 surface parking spaces (92 more than the code requirement) would be provided on the building site itself and on the Seattle City Light right-of-way, which would be leased by the developer for that purpose. Building height is assumed to be the 125-foot maximum for the MIC-H zone; as shown in Figure 2-2, the building and other site development would observe all applicable setbacks and landscaping requirements for the zone and the shoreline overlay. Frontage improvements would be required under the sidewalk ordinance of the Tukwila Municipal Code, which is separate from the requirements of the zoning code. Frontage improvements are discussed in Chapter 5, Transportation.

The overall land use effect of the prototype project would be to intensify the use of the site as compared to the existing assortment of low-rise commercial and light industrial uses. Such intensification would be consistent with MIC plans and policies and could be accommodated by the existing infrastructure. Employment would increase significantly, with associated increases in traffic generation (see Chapter 5, Transportation, for a discussion of impacts). Aesthetically, the site would likely improve through development of a single, unified use that conformed to setbacks and landscaping requirements and visually opened

up a currently obscured area of the riverfront; the project would also be required to comply with shoreline design guidelines, as described in Chapter 4. The development would be consistent with permitted uses under the zoning code and compatible with nearby development, particularly the Boeing Office Park across South 112th Street.

Prototype Site 2

Prototype Site 2 is assumed to be developed as a warehouse distribution center with a small amount of supporting office space. Existing buildings would be demolished and replaced with a single structure approximately 45 feet in height, which would accommodate about 73,000 square feet of gross floor area; 135 surface parking spaces (9 more than required by code) would be provided. As with Prototype Site 1, the applicable setbacks and landscaping requirements would be observed (Figure 2-5 and Table 3-3), and frontage improvements would be provided in accordance with code requirements.

Although the site's use would change under this scenario, the change would be relatively minor from a land use standpoint. The primary effects would be higher trip generation (due to the site's function as a distribution center) and potential changes in site access, both of which are discussed in Chapter 5 of this document. Though the building would likely be larger than those existing on the site and would have smaller setbacks, its general character and aesthetics would be consistent with other development in the area.

Prototype Site 3

This scenario would involve the redevelopment of the northern portion of Boeing's Plant 2 facilities. Approximately eight buildings on the site would be torn down and replaced with two new buildings housing 750,000 square feet of high-bay manufacturing space and 700,000 square feet of laboratory space. The manufacturing building would be constructed over the water on the same footprint as the existing building, which is allowed for under the proposed shoreline overlay district regulations (see Chapter 4). Parking would continue to be provided offsite across East Marginal Way, with 200 additional onsite spaces added; the existing parking supply is assumed adequate to accommodate the required 1,450 spaces. The current access point off East Marginal Way would be maintained and a new driveway added (Figure 2-4). The development is assumed to upgrade the facilities at the site and to result in an employment increase of about 3,265.

In general, land use on this site would remain similar to existing conditions and would be consistent with the MIC subarea designation and the intent of the zoning code. However, the existing northern building is a nonconforming use in terms of its overwater construction. The key issues raised would, thus, be replacement of the existing overwater structure and the general increase in building bulk. Overwater structure replacement considerations would include the need to protect water quality during demolition and construction activities and the potential for effects on fish habitat and other aquatic resources during construction and operation; these considerations are discussed in Chapter 4, Shoreline Use. Building bulk and scale effects on the visual character of the project area would be addressed to some degree by the shoreline design guidelines discussed in Chapter 4; however, much of the redevelopment would occur outside the shoreline area. In any case, the design guidelines do not impose setback requirements or building height restrictions (other than the underlying zoning) for redeveloping properties on the shoreline. Thus, the visual

character of the area as seen from across the river and, to a lesser degree, from East Marginal Way would change from existing conditions.

Corridor-Wide Issues

As noted in Chapter 2, the prototype sites are not actual development proposals, but illustrate the types of projects and resulting impacts likely to result under the MIC implementation plan. Their analysis raises several overall land use issues for development of the MIC corridor.

Under the implementation plan's expedited and predictable review system, land uses in the corridor are likely to intensify over time toward the limits allowed under current planning and zoning. All three of the prototype scenarios reflect this trend. Such intensification will depend highly on regional economic conditions; however, the ultimate effect of growth management planning will be to concentrate industrial growth into a finite designated land base, of which the Tukwila MIC is a part. As industrial lands become more scarce, development density will increase, and vacant or underutilized sites will tend to infill. As shown in Table 3-1, approximately 8 percent of land in the MIC is currently vacant. This land is likely to develop with uses allowed under the code, and—as exemplified by Prototype Scenario 1—land currently developed at lower densities will probably transition into higher ones.

The intensification of land use will bring with it a number of related impacts, including increased traffic, greater building bulk and scale, and the potential for more highly developed areas along the Duwamish shoreline. Chapters 4 and 5 of this document specifically address some of these issues. However, these impacts occur in the context of an already highly developed urban environment, which contains ample infrastructure to support industrial uses and has a long history of such uses. MIC zoning district requirements, and other applicable regulations, reflect the city's policies for the corridor. These policies recognize that economic development and environmental protection must be balanced to achieve the MIC's regional purpose.

No Action Alternative

Because the policy, planning, and zoning basis for land use in the MIC has already been adopted and is currently administered under the existing comprehensive plan and zoning code, impacts of the No Action alternative would generally be as described for the implementation plan. However, the potential exists that, with each individual development subject to project-level SEPA review and conditioning, development consistent with adopted plans and policies could take place more slowly and with less consistent review than that afforded by the MIC implementation plan process.

Mitigation Measures

The MIC implementation plan and prototype site development are generally consistent with local and regional land use plans, policies, and regulations; no mitigation is proposed. The following measure is suggested to facilitate development approvals for projects consistent with the implementation plan:

- Develop a system to notify developers concerning height limitations and to advise airport officials when a potential impact is identified.

Unavoidable Adverse Impacts

No unavoidable adverse land use impacts are expected to result from the implementation plan.

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Shoreline Use

The shoreline zone of the Duwamish River/Waterway, defined as the area within 200 feet of the ordinary high water mark of the river, is subject to a number of special protective requirements under the Washington State Shoreline Management Act and various plans, policies, and regulations of the City of Tukwila and King County. Activities occurring within the river itself are also regulated through a variety of permits issued by the U.S. Army Corps of Engineers (the Corps), the Washington State Department of Ecology (Ecology), and the Washington State Department of Fish and Wildlife (WDF&W). This chapter describes the natural and built features of MIC shorelines, the regulatory protections and processes listed above, and the potential impacts of the MIC implementation plan on the shoreline area.

Existing Conditions

Historical Shoreline Development

Before the turn of the century, the Duwamish River was fed by Lake Sammamish, Lake Washington, and the Cedar River by way of the Black, Green and White rivers. In 1911, flow from the White River was diverted to Tacoma. Other diversion projects eliminated flows from the Black and Cedar Rivers. Today, the Green River is the only significant tributary to the Duwamish, which is one of the most industrialized water bodies in the Puget Sound region.

Dredging of the Duwamish River, completed in 1921, resulted in replacement of approximately 9 miles of meandering river with 4 miles of channel. This channel, now known as the Duwamish Waterway, is a marine-oriented waterway used primarily by the Port of Seattle to move waterborne cargo. The Corps maintains the Duwamish as a navigable waterway to the Turning Basin, which is located just north of the Oxbow site. South of the Turning Basin, the channel begins to take a more natural course and is referred to as the Duwamish River.

Existing Shoreline Land Use

Shoreline areas in the MIC are dominated by manufacturing and office use sites. Figure 3-1 shows existing shoreline development. Boeing controls roughly 75 to 80 percent of the shoreline property located on the east shoreline from the north city limits south to Norfolk Street, and uses it for office, lab, and manufacturing functions. The remaining sites along this corridor consist of Rhone-Poulenc, a former food product manufacturing plant now used for storage of shipping containers, and manufacturing plants for Jorgensen Steel and Kenworth Trucks. Across the river and to the south is the 31-plus-acre Oxbow site, which provides as much as 9 acres of parking, a mail processing plant and an office building. On these large sites in the northern portion of the MIC, the vast majority of the land area, buildings, and activities is located outside of the shoreline zone. For example, the sites

average a depth of about 1,300 feet between the river and East Marginal Way; only the westernmost 200 feet, or 15 percent, is within the river zone.

The character of the sites south of the Boeing Access Road is significantly different from those farther north. These sites are much smaller, and many are fully contained within the shoreline zone. Several small industrial buildings are clustered on these sites in the narrow area between the road and the shoreline. Farther south, the area opens up to moderate-sized sites that are either underutilized or vacant. An exception is the Boeing customer service center, with 378,000 square feet of office space, which is located northwest of the intersection of the river and Pacific Highway South. This 13-acre site is fully developed with two office buildings surrounded by parking.

In addition to the Oxbow, a variety of industrial sites are on the west bank of the Duwamish, including the Gateway North Business Park, Sea King industrial park, and a small industrial/outdoor storage area south of the Turning Basin.

At the southern edge of the MIC, the Green River Trail is located along the west bank of the river from East Marginal Way South to Pacific Highway South. Heading north, the trail crosses the river at Pacific Highway and follows the river on the east bank until the pedestrian bridge near the Boeing customer service center, where once again it crosses. At this location, King County is developing the North Wind Weir Park on the river's west bank. North of the park, the trail departs from the shoreline zone and follows West Marginal Way.

Roads and utilities, including the Seattle City Light substation, are developed along roughly 16 percent of the shoreline within the MIC.

Project Area Shoreline Classifications

A report prepared by Curtis D. Tanner for the Port of Seattle and the U.S. Environmental Protection Agency (EPA), "Potential Intertidal Habitat Restoration Sites in the Duwamish River Estuary," classified the shoreline areas along the Duwamish River and the waterway. Four classifications were identified: natural shorelines, riprap shorelines, pier aprons, and sheet piling. They are described below:

- **Natural Shoreline.** This classification does not indicate that the shoreline is in its original condition, but rather that the area generally exhibits a gently sloping shoreline with areas of fine-grained sediment.
- **Riprap Shoreline.** This refers to shorelines stabilized with angular rock, generally larger than 12 inches in diameter and relatively steep slopes, ranging from 1:1 to 2:1. In some areas, fine-grained sediment may be present, as well as intertidal benches below the riprap area.
- **Pier Aprons.** These are generally concrete or wood pier structures where the water is allowed to flow underneath the pier, in between the vertical structural members.
- **Sheet Piling.** Sheet piles, also known as vertical bulkheads, divert the flow of water around the pier or landform.

The classifications of the roughly 33,000 linear feet of shoreline in the MIC are shown on Figure 4-1.

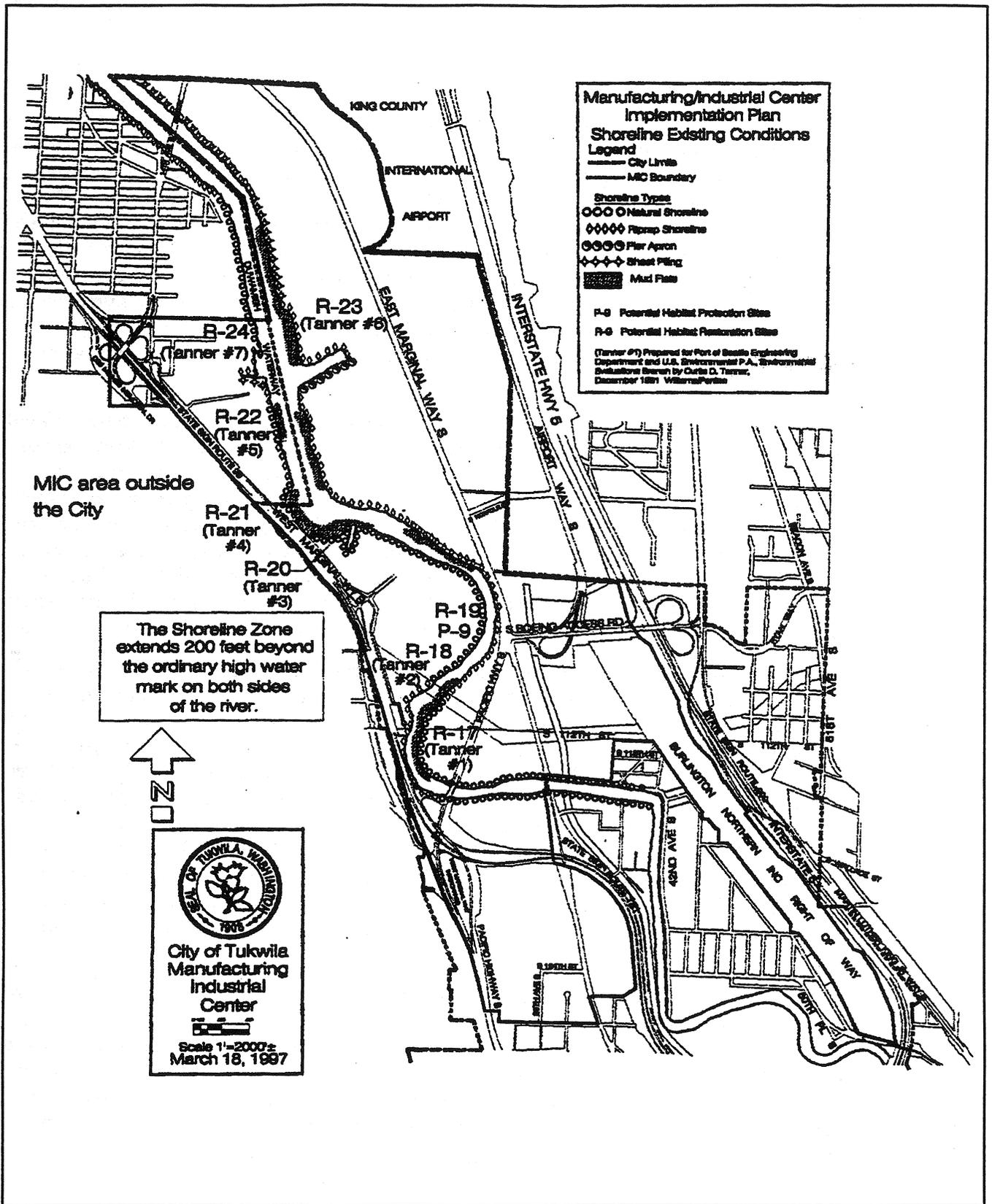


Figure 4-1
**MIC Shoreline Classifications and
Habitat Protection/Restoration Sites**

Terrestrial, Wetland, and Aquatic Habitats

This section describes the existing terrestrial, wetland, and aquatic habitats along the Duwamish River as it passes through the Tukwila MIC. Much of the material in this section has been drawn from the report by Tanner (1991), who identified and mapped existing habitats and described potential restoration sites in the Duwamish River estuary. Other sources of information included wetland, stream, and habitat inventories by the U.S. Fish and Wildlife Service (USFWS, no date) and the City of Tukwila (City of Tukwila 1993; 1995; Jones and Stokes 1990). A search of agency databases for documented occurrences of rare, threatened, and endangered species, priority habitats, and high quality ecosystems was also conducted, with negative results (USFWS 1996; WDF&W 1996; WNHP 1996). In addition, surveys of the river environment were made by canoe in September 1996 and by car on January 29, 1997.

The Duwamish River is the dominant biological, as well as physical, feature in the Tukwila MIC. Before settlement and development by Euro-Americans over the last 100 to 150 years, the area within the MIC was largely estuarine wetlands associated with the Duwamish River (Tanner 1991). This riverine-estuarine system was fed by drainage from Lake Washington, Lake Sammamish, the Cedar River (via the Black River), the Green River, and the White River, a total drainage basin area of 1,642 square miles. Discharge in the Duwamish River ranged from 2,500 to 9,000 cubic feet per second (cfs). Wetland habitats within the Duwamish River estuary consisted of higher intertidal areas with forests and shrub lands and lower intertidal marsh areas dominated by sedges, rushes, and other herbaceous plants.

The present conditions of the Duwamish River and its shoreline are drastically different from this pre-settlement ecosystem. As described above, the river has been channelized and much of the drainage basin rerouted through Lake Washington and the Hiram H. Chittenden Locks, resulting in a decrease in mean annual flow to about 1,530 cfs. Ninety-eight percent of the wetlands has been lost through diking, filling, and changes in hydrology (Grette and Salo, 1986). By 1921, the river was dredged from its mouth to the Turning Basin, and is now maintained as a federal navigation channel through this reach by the Corps. The authorized navigation channel in the MIC is 150 feet wide and 15 feet deep upriver to the bend just south of the 16th Avenue South Bridge, and 12 feet deep south to the Turning Basin (NOAA National Ocean Survey chart 18450). In addition to the channel, private dredging has increased depths to 12 to 15 feet at wharf approaches, and in marinas and slips in the MIC.

Despite the extensive alterations that have taken place in the Duwamish River ecosystem, a variety of wildlife and fish use the remaining habitat. Tanner (1991) compiled lists from several sources that document observations of 84 bird, 20 fish, and 9 mammal species in the Duwamish River estuary in its present configuration and land use. Tanner also surveyed and described locations where restoration or enhancement of nearshore, saltmarsh, and riparian habitats could be accomplished. Several of these projects are underway or under consideration by organizations including the King County Department of Natural Resources, the City of Seattle, the Port of Seattle, and the Muckleshoot Tribe.

The most important upland habitat features in the MIC are the limited areas of substantial riparian vegetation. Extensive portions of the riverbanks just above the ordinary high water line are dominated by Himalayan blackberry (*Rubus discolor*) thickets, which provide only limited habitat for small mammals and birds; however, several locations retain large

vegetation sufficient to serve as usable habitat. Primary species include large cottonwoods (*Populus tricocarpa*), big-leaf maple (*Acer macrophyllum*), red alder (*Alnus rubra*), box elder (*Acer negundo*), willows (*Salix* spp.), and some exotics such as Lombardy poplar (*Populus nigra* var. *italica*) and locust (*Robinia* sp.). These vegetated areas provide habitat for a number of small mammals and passerine birds that otherwise would be absent from the MIC. The larger trees along the river provide important perching and roosting habitat for birds such as crows, gulls, kingfishers, cormorants, and perhaps ospreys and great blue herons. Large trees also provide shading of adjacent waters and occasionally fall into the channel, where they provide instream habitat for small fish. Emergent limbs and roots provide perches closer to the water.

Perhaps the most important ecological function of this reach of the river is its role as a corridor for the downstream migration of juvenile anadromous salmonids (smolts). The Duwamish, and the Green River upstream, have runs of chinook, coho, chum, and pink salmon (*Oncorhynchus tshawytscha*, *O. kisutch*, *O. keta*, *O. gorbuscha*), as well as sea-run steelhead, cutthroat and Dolly Varden (*O. gardneri*, *O. clarki*, *Salvelinus malma*, respectively). The transition area from fresh to salt water is known to be very important both in allowing smolts to adjust their physiological processes for salt water living and as a feeding/rearing area; it is well known that larger smolts are better able to survive the rigors of their early marine life history.

At and below the high tide line, the intertidal shorelines of the lower Duwamish River include a variety of natural and artificial habitats. The artificial habitats (vertical bulkheads, sloped riprap, and miscellaneous debris such as concrete slabs) are generally less productive (e.g., support fewer prey organisms for smolts) than the more natural mud banks and the limited remaining mudflats. Lower in the estuary, however, these hard substrata become colonized with a productive assemblage of rockweed (*Fucus gardneri*), barnacles (*Balanus glandula*), and mussels (*Mytilus trossulus*). Also, in areas where substantial amounts of silt have accumulated in the interstices of riprap or rubble, the habitat may support populations of epibenthic zooplankton that approach the densities found on muddy shorelines. Steeper slopes of bulkheads and most riprapped areas are perceived to have the potential to increase the vulnerability of juvenile salmonids to predation from fish or diving birds; however, such shorelines may reduce the vulnerability of small fish to other predators such as kingfishers and herons.

In areas where the slopes are relatively flat (e.g., 3 horizontal to 1 vertical or flatter) and the substrate is unconsolidated sand or mud, a fringe of brackish or saltmarsh vegetation may be established. This habitat type is considered valuable because organic detritus from the marsh is transported downriver to become a productive habitat for crustacean and insect prey for fish and birds. A green saltmarsh edge is also an aesthetic amenity for the limited recreational users of the river.

Most of the lower intertidal and subtidal river bed is silty sand or mud that is moved at various rates by tidal and river currents. This habitat, especially the shallower areas next to dredged bottoms where benthic primary productivity is high, is very productive and has good densities of epibenthic zooplankton, which are important prey for juvenile salmonids, other small fish, and shorebirds. Low-gradient mud bottoms are highly valued as migration corridors for juvenile salmonids, offering both a good prey base and shallow-water escape from predators such as fish and diving birds. Mud and sand bottoms in the navigation channel and connecting dredged areas provide habitat for brackish water tolerant species

such as starry flounder (*Platichthyes stellata*) and Dungeness crab (*Cancer magister*); use by these species declines with distance upstream and is probably limited above the Turning Basin. Sediment quality in some areas has been degraded by historic discharges from urban and industrial sources; several ongoing investigations are aimed at identifying and remediating these areas.

The following sections detail the distribution of these habitat types along the Duwamish River within the MIC area. For purposes of discussion, the river and its shoreline are divided into three reaches: (1) Allentown to North Wind Weir, (2) North Wind Weir to Turning Basin, and (3) Turning Basin to Duwamish River Park.

Allentown to North Wind Weir

The Duwamish River is channelized at the south end of the MIC. The river is bordered on the west bank by houses in an area zoned for low-density residential use that borders the MIC. The east bank, which lies within the MIC, is well-wooded with bigleaf maple, red alder, willows, and cottonwoods. Larger trees have fallen into the river in several locations, providing in-water cover for fish and perches for cormorants and kingfishers. Except for shallow bars at Codiga Farm and downstream on the west bank, the riprapped or steep mud banks provide little shallow-water habitat for fish.

From Interurban Avenue South to Pacific Highway South, the channel bank is lower and less steep on the west side of the river, where a bike trail is situated between a business park and the river. The river bank has been recently revegetated in this area, but plantings are not yet well established. The Riverton Creek outfall, consisting of a flap gate, is located on the west bank, next to Pacific Highway South. The east bank is dominated by non-native Himalayan blackberry, and the adjacent shoreline area is largely developed. A 1993 inventory of natural environmental features and habitat by the City of Tukwila noted the presence of great blue heron, beaver, and muskrat in this reach of the river. The less steep shoreline on the west side of the river provides some shallow-water habitat for juvenile fish and exposed mud slopes for shorebirds, but otherwise there is little instream habitat structure for fish in this reach.

From Pacific Highway South to South 112th Street (where the North Wind Weir is located), the left bank has riprap and is bordered by the State Route (SR) 599 freeway. Above the riprap, the shoreline is primarily vegetated with Himalayan blackberry and reed canary-grass (*Phalaris arundinacea*). The east bank is primarily blackberry, with a row of Lombardy poplars along the top of the bank. A portion of the bank has been stabilized and has some willow plantings. A bike trail follows the top of the bank, with the rest of the shoreline area occupied by the Boeing Customer Service Center. As in upstream reaches, limited instream habitat for small fish is found in this area.

North Wind Weir to Turning Basin

North Wind Weir is a rocky outcropping that crosses the channel, creating a small rapid at extremely low tides (Warner and Fritz 1995). It is reported to be a traditional Native American fishing site (David Rice, personal communication, as cited in Tanner, 1991). A gill net set here on January 29, 1997, was being raided by a young California sea lion, which was observed taking several steelhead (*Oncorhynchus mykiss*) from the net. The west bank directly below the new Green River Trail bridge is riprapped with old tires, below which a large eddy is eroding into a vacant area planned for development by King County as the

North Wind Weir Park. Along with landscaped areas, the design for this park will also include a wetland slough area connected to the river (Elliott Bay/Duwamish Restoration Program 1996).

As the channel proceeds east from this point, the shoreline becomes unconsolidated material and has a more gentle slope. A small intertidal marsh area with patches of sedge (probably *Carex lyngbyei*) occurs along the west bank; above this is a stand of shrubs and trees, including some large cottonwoods. This area has significant terrestrial, wetland, and shallow-water habitat value for fish and was identified as a potential restoration Site 2 by Tanner (1991). The adjacent upland area is now a major Postal Service facility.

The east bank below North Wind Weir was also identified as a potential restoration site (Site 1) by Tanner (1991). The shoreline has a fairly low, unconsolidated bank, with vegetation consisting of a patch of willows in the area of the weir and extensive areas of blackberries downstream. The edge of the channel has exposed mudflat areas with some emergent vegetation, including patches of *Carex lyngbyei*. The land above the channel bank is under commercial and light industrial land use and currently contains little vegetation.

As the channel turns northeast, just south of the Boeing Access Road, the shoreline area above the left bank is landscaped for about 1,000 feet and then is bordered by parking lots. A short segment of steep, actively eroding bank is below the bike trail, which follows the shoreline in this portion of the river, but most of the channel bank downstream is less steep and well-vegetated with reed canarygrass.

North of the Boeing Access Road, the east bank of the channel is located immediately adjacent to Interurban Avenue South and is bordered by riprap. As the river veers away from Interurban Avenue South, the shoreline area is entirely industrial, occupied primarily by the Boeing Company. There is a small landscaped park between a Boeing parking lot and the river just north of the small bridge accessing the Boeing parking area.

Downstream of this park, the Norfolk combined sewer outfall enters the river on the east bank. Downstream of this outfall, mudflats are exposed at low tide on both sides of the river. On the west side of the river, these flats extend downstream into the Turning Basin area.

Turning Basin to Duwamish River Park

The Turning Basin is a wider portion of the river that is used as a sedimentation basin and is the end of the federal navigation channel periodically dredged by the Corps (Tanner 1991). The west side of the basin has a small embayment, at the head of which is the mouth of a small tributary stream that enters through culverts under West Marginal Place. Significant intertidal mudflats occur along the sides of the embayment and are contiguous with mudflats upstream along the west bank. There has been a recent project to restore portions of the mudflat and adjacent shoreline with native species (the 'Coastal America' project, in potential restoration Site 3 in Tanner). A small (2.1-acre) area of undeveloped fill deposits is located along the northwest side of Turning Basin and was identified as potential restoration Site 4 in Tanner (1991).

The east bank of the Turning Basin area is steep riprap, with Boeing industrial facilities immediately above the bank. However, significant intertidal mud flats are mapped in this

area by Tanner (1991), are apparent below the riprap at low tide, and offer shallow-water habitat next to the dredged channel.

Downstream of the Turning Basin, the shoreline is highly developed, and the channel is mostly bordered by riprap and sheet piling on both sides. Below these hardened shorelines, low intertidal and shallow subtidal mudflats border the navigation channel on both sides, offering shallow-water habitat at lower water levels. An additional feature in this reach of the river is a 25-acre parcel of land on the west bank, just north of the Seattle City Light substation. According to Tanner (1991), this site consists of fill accumulated from dredging the Turning Basin. It is currently open grassland that is regularly mowed and is bordered by blackberry. Ham Creek flows along the perimeter of this open area, and some riparian restoration along the creek at the west side of the parcel has been undertaken by "I'm a Pal" (International Marine Association Protecting Aquatic Life). The entire parcel has been identified for restoration by several groups, including "I'm a Pal" and the Port of Seattle-EPA (Site 5 in Tanner 1991).

Other patches of terrestrial and wetland wildlife habitat include a strip of shrubs and trees along the left shoreline, next to a Boeing research facility (just north of South Director Street) and some broader intertidal mudflat areas just north of Slip 6 off the Duwamish Waterway. Slip 6 and the area just north of the Duwamish Yacht Club (including a small drainage channel entering the river) were identified as potential restoration sites 6 and 7, respectively, in Tanner (1991).

The west bank of the river both upstream and downstream of the 16th Avenue South Bridge is riprapped, with only limited areas of lower-gradient mud or debris banks and little riparian vegetation. At the lowest tides, a strip of mudflat is exposed downstream of the bridge. The east bank upstream (south) of the bridge is dominated by Boeing Plant 2 structures, which extend over the shoreline on pilings. A wall of horizontal timbers on the outer line of pilings protects the underside of the building and partially isolates the riverbank under the building from the river. At low tide, mudflats are exposed in front of Plant 2 and offer shallow-water habitat to migrating fish. However, the continuity of this habitat is limited by the timber wall at higher tides.

North (downstream) of the 16th Avenue South Bridge, another Boeing structure similarly extends on pilings partially over the mudflats. Horizontal timbers are also placed on the outer line of pilings, with similar habitat implications, although the mudflat between the structure and the navigation channel is broader than that adjacent to Plant 2 south of the bridge.

Identified Habitat Protection and Restoration Sites

As part of the work done in support of Shoreline Master Program revisions, consultants to the City of Tukwila (Williams/Pentec, 1997) recently completed an inventory of potential habitat protection or restoration sites. This inventory was conducted to identify sites that should be protected, in keeping with the city's shoreline planning policies, during future development along the Duwamish River, and to establish potential locations at which off-site habitat restoration mitigation activities could be focused. For the MIC portion of the river, one site was identified as important for protection and five sites as potential habitat restoration areas. Four of the latter were previously identified in a report prepared by Curtis Tanner for the EPA (1991).

The primary criterion used to identify sites for protection was the presence of significant stands of native woody vegetation. Given that the entire channel and banks of the Duwamish River within the city have undergone substantial alteration, there is virtually no undisturbed shoreline area present. Natural features have largely been modified by channelization, diking, rerouting of streams, filling, and other means. In places, however, there are patches of native shrubs and trees that provide some habitat features characteristic of low-elevation, low-gradient rivers in the Puget Sound Basin. Shading of the stream, input of large woody debris, roosting sites and forage for wildlife, and bank stabilization are some of the important functions that native shrubs and trees provide.

Criteria for potential restoration sites included wider places within the floodway, presence of some native trees and shrubs that could be further enhanced, presence of tributary streams with potential salmonid habitat, a low degree of development, and/or ownership by the city. It should be noted that almost any portion of the shoreline has potential for enhancement or restoration, since the area has been so extensively and severely altered from its natural condition. The sites identified here represent the best opportunities. The locations of the sites are shown on Figure 4-1; a brief description is provided below. Site numbers referred to are those established in the inventory document (Williams/Pentec, 1997).

Typically, restoration plans for these areas would involve excavation of materials along the top of the banks, reductions in shoreline slopes, and replacement of hardened shorelines with native vegetation, gravel, sand, or mud. These actions are expected to create more extensive and natural intertidal habitat for juvenile salmonids and other fish, as well as for shorebirds and waterfowl.

Important Areas for Protection

Site P-9: Wooded Shoreline Area Next to U.S. Postal Service Facility. This site has recently been altered by construction of the U.S. Postal Service facility. Some of the shoreline has not been developed; it consists of relatively natural bank with emergent vegetation, shrubs, and a grove of trees.

Potential Sites for Restoration/Enhancement

Site R-17: Left Bank Adjacent to Boeing Parking Lot. This site could be enhanced with planting of native vegetation. In-channel restoration for fish habitat would be most beneficial, but enhancement of riparian vegetation would also be valuable for wildlife. Some limited opportunities, probably in conjunction with needed bank stabilization, exist here.

Sites R-18 - R21: Port of Seattle/EPA Designated Sites. Seven sites identified in the study conducted by the Port of Seattle and EPA (Curtis, 1991) are within the City of Tukwila. These represent the primary opportunities for restoring or enhancing estuarine conditions for juvenile salmonids, probably the most important biological function of this reach of the river.

A restoration project has already been conducted at one of these sites in the Turning Basin. Restoration projects at two other sites are planned as part of the Elliott Bay - Duwamish Natural Resources Damage Assessment settlement, which would preclude their use for mitigation of city-permitted projects (Tanner, 1996). These are the City Light South and City Light North sites identified by Tanner (1991).

Site R-18 is located across the street from the Boeing Customer Service Center on the east bank, in the shoreline area of Prototype Site 1. It is in an area known to be important to salmonids for their transition from freshwater to saltwater. Mudflats, partially vegetated with sedges and other emergent vegetation, occur along the shoreline. Shoreline and adjacent upland areas afford good opportunity for creation of a diverse intertidal and related wetland habitat. The size, characteristics, location, and availability make this site the best opportunity for restoration.

Site R-19 is located directly across the river from R-18. The shoreline consists of some riprap and relatively natural bank with emergent vegetation, shrubs, and trees. Much of the site has recently been redeveloped for a U.S. Postal Service facility, but some of the shoreline area has not been developed. A diverse array of intertidal and wetland habitats could be created here.

Site R-20 is a shallow side-waterway off the main channel within the Boeing Company complex. It is no longer used for navigation and offers some opportunity for creating intertidal habitat and vegetated shoreline.

Site R-21 is a 4.7-acre parcel just north of the Duwamish Yacht Club. The shoreline is primarily riprap, but removal of riprap, regrading of the shoreline, and establishment of native riparian and emergent vegetation would create a significant patch of valuable fish and wildlife habitat.

Current Plans, Policies, and Regulations

The City of Tukwila currently administers two sets of shoreline master programs (SMPs) and regulations for development along the Green/Duwamish River. Properties located south of the 42nd Avenue bridge are subject to the City of Tukwila SMP. The properties north of the bridge were annexed from King County subsequent to the adoption of the Tukwila SMP; as a result, the City has been administering the King County SMP since the properties were annexed. The MIC lies within the area subject to King County SMP regulations.

One of the city's goals for 1997 is replacing these two SMPs with a new SMP and development regulations, expected to be completed in the second half of the year. The policy basis of the new SMP is embodied in the Tukwila Comprehensive Plan, adopted in December 1995. The development regulations are planned for adoption as a shoreline overlay zoning district, which will replace the shoreline overlay district currently in the city's zoning code. Both the policies and the regulations include components specifically applicable to the MIC. Adoption of these MIC-specific policies and regulations are part of the planned action analyzed in this EIS.

Because of the transitional state of planning for the city's shorelines, both the proposed Tukwila shoreline policies and regulations and the existing King County SMP are discussed below. Also described briefly are a number of other state and federal permit processes that provide protection for aquatic resources within the Duwamish River and would apply to inwater development projects (e.g., construction of new piers or shoreline stabilization) in the MIC.

City of Tukwila

Tukwila Comprehensive Plan (1995)

As discussed above, the shoreline element of the Tukwila Comprehensive Plan is the policy basis for the city's new SMP, currently under development. The policies identified below have already gone through substantial public process and have been adopted by the City Council. The only change proposed to the Comprehensive Plan policies is addition of the restoration goal and principles of the habitat restoration plan prepared by the Duwamish Coalition. A complete version of the current policies is included in Appendix B.

The Plan's shoreline policies are intended to facilitate the redevelopment of the MIC, while simultaneously recognizing the value of the river as a natural resource and public amenity. The Washington State Shoreline Management Act designates the Green/Duwamish River as a shoreline of statewide significance. Tukwila's shoreline policies reflect the statutory requirements of the Act, but also give priority to the economic vitality of the MIC. The Plan's Shoreline Policies specifically applicable to the MIC are quoted below.

- 5.1.2 Manufacturing/Industrial Center Environment: In the Manufacturing/Industrial Center Environment, priority shall be given to the following:
 - Redevelopment of under-utilized areas and development of intensive commercial and industrial activities; and
 - Enhancement and restoration of access to the river; and
 - Protection and restoration of natural environment features and riverbank characteristics, where compatible with development.

The following area shall be designated as the Manufacturing/Industrial Center Environment:

- The entire shoreline zone (200 feet on either side of the Ordinary High Water mark) from the northern City limits upstream to the Highway 99 bridge.
- 5.3.1 Develop and implement River Design Guidelines to
 - Guide the design of multiple shoreline uses;
 - Establish techniques for increasing multiple shoreline use;
 - Prioritize locations for uses.
- 5.3.9 Ensure that shoreline development in the MIC that is not water-dependent either provides for shoreline multiple uses to the extent that site security and the success of industrial operations are not jeopardized, or provides adequate mitigation for loss of shoreline multiple use opportunities.
- 5.3.10 Allow opportunities for commercial and recreational marinas to locate in Tukwila downstream of the Turning Basin, where compatible with existing and future navigability.
- 5.5.2 Require that shoreline development in the MIC:
 - Is designed to be consistent with Tukwila river design guidelines; and

- Maintains or enhances the existing visual quality along the river; and
 - Provides trees and other landscaping to buffer industrial uses that are incompatible with other river uses; and
 - Provides amenities that enhance enjoyment of the river by employees.
- 5.6.9 For MIC properties included in the King County Green River Trail Master Plan, require shoreline development to provide a trail for public access along the river.
 - 5.6.10 Where shoreline public access is provided, ensure that it is designed to be safe and convenient and includes access amenities such as benches, drinking fountains, public parking areas, handicapped access and appropriate lighting, consistent with the river access guidelines.
 - 5.6.11 For MIC properties not included in the King County Green River Trail Plan, require shoreline development to provide public access or a private natural area in lieu of public access, or otherwise mitigate the loss of public access.
 - 5.7.4 Encourage maintenance of the river's navigability up to the Turning Basin, where this achieves a greater public interest and a balance between costs and benefits to the broader community, in recognition of the historical significance of navigation and its importance to the economic vitality of water-dependent uses and the MIC.
 - 11.1.7 Support the Duwamish River becoming a natural feature amenity in the MIC.
 - 11.1.8 Improve public access and use of the west side of the river, protecting owners' rights to reasonable use and enjoyment, improve employee access to the east side of the river, and emphasize restoration on both sides of the river.

In addition to these adopted goals and policies, the city is evaluating the possibility and appropriateness of adopting the restoration goal and principles of the Lower Duwamish Habitat Restoration Plan prepared by the Ad Hoc Duwamish Habitat Restoration Group. This group was composed of representatives and staff from local, state, regional, federal, and tribal governments; business, environmental, and community organizations; and interested citizens. The goal and principles of the plan are as follows:

Restoration Goal. The goal of this restoration plan is to provide a diversity of self-sustaining habitat types and abundance within the Lower Duwamish Watershed to enhance fish and wildlife while maintaining a healthy, working waterfront of port, industrial, fisheries, and recreational uses.

Restoration Principles:

1. Provide a functioning and sustainable ecosystem.
2. Integrate a restoration strategies to increase the likelihood of success.
3. Coordinate restoration efforts with other planning and regulatory activities to maximize habitat restoration.
4. Involve the public in restoration planning and implementation.

5. Maintain a working waterfront of Port and industrial uses that transitions through mixed industrial, commercial, residential recreational and open space uses, depending on the neighborhood.

As part of its ongoing work on the SMP, the city also requested a review of the Comprehensive Plan shoreline policies with respect to their effectiveness in preserving and enhancing aquatic habitat. The results of this review are included in the "MIC Shoreline Impact Analysis" in Appendix B-2 and include suggestions for strengthening the policy language related to habitat protection. The city recognizes these suggested revisions as generally appropriate. In lieu of amending the adopted policies through a formal process, the city will implement regulations to address the intent of the recommended revisions as part of the new SMP.

Tukwila Zoning Code

Chapter 18.44 of the Tukwila Zoning Code creates a "shoreline overlay" district, designed to provide for the regulation of development affecting areas of the city under the jurisdiction of the Shoreline Management Act. While it allows the permitted uses and certain other provisions of the underlying zoning to prevail, it defines additional aesthetic and dimensional requirements for three "management environments" (river, low-impact, and high-impact) within the 200-foot shoreline area. However, while there are no limitations that would prevent the requirements of Chapter 18.44 from being applied to the MIC, it is not currently enforced there, and the regulations of the King County SMP prevail.

Also included in the city's zoning code (Chapter 18.60) are provisions for design review of certain projects within the city, including those within the shoreline area. This process is conducted by the city's Board of Architectural Review in conjunction with the shoreline permit process. Review guidelines include the relationship of the proposed structure to the site and to the adjoining area, landscaping and site treatment, and building design. As part of its SMP development, the city envisions replacing the BAR review with an administrative review based on adopted river design guidelines, as called for in shoreline policy 5.3.1. However, the proposed guidelines have not yet been developed.

As noted above, a new set of shoreline development regulations is currently under development and is proposed for adoption as part of the new Tukwila SMP. These regulations would replace the requirements of the shoreline overlay district currently in the zoning code. While the shoreline policies in the Comprehensive Plan, as noted above, have gone through substantial review and public involvement, the new regulations have not yet been subject to such review. As part of the MIC implementation plan, the regulations specific to the MIC are analyzed under SEPA as part of this EIS. The full SMP, including all policies and regulations, will also be subject to separate SEPA review before its adoption by the city.

Table 4-1 compares the new shoreline regulations for the MIC with those currently in effect under the 1977 King County SMP. Because little or no water-dependent or related development is anticipated in the corridor, only the regulations affecting non-water-related development and redevelopment of existing sites are covered here (see Table 2-1 for a full listing). The regulations are discussed briefly by category below.

Proposed General Requirements

Permitted Uses. Uses permitted in the underlying zone, MIC/H or MIC/L, of the adopted zoning code (TMC Chapter 18) will be allowed within the shoreline zone. Priority is given

to redevelopment of underutilized areas and investment in industrial facilities that provide family-supporting wages; implementation of the King County Green River Trail Plan for public access and alternative private access or intertidal habitat development otherwise; and protection and restoration of natural environment features and riverbank characteristics, where compatible with development.

Height Restrictions. Height restrictions under the new regulations are the same as those of the underlying zoning, with exceptions based on King County Airport height restrictions and certain provisions of the Shoreline Management Act. The MIC/L zone limits height to four stories or 45 feet and the MIC/H zone limits height to 125 feet. The Shoreline Management Act limits height to 35 feet when a substantial number of adjacent residential views will be obstructed; however, there are limited or no residential uses within the MIC. Height limitations within the King County Airport approach zone area are discussed in Chapter 3. No additional restrictions are proposed for the SMP.

Shoreline Access. Shoreline substantial development or conditional uses shall provide new public access, employee access and amenities, or connections from public areas to the river where any of the following conditions are present:

- The development or use will create increased demand for public access to the shoreline.
- The development or use will interfere with an existing public access way.
- The use is not water-dependent.
- The use or development will interfere with use of public lands or waters.
- The river frontage on the site has been identified as a location for a trail in the Green River Trail Master Plan.

An applicant need not provide public access where the site is not on the Green River Trail Master Plan and one or more of the following conditions are present:

- Unavoidable health or safety hazards to the public exist which cannot be prevented by any practical means.
- The project constitutes redevelopment within the river environment and the existing site development does not provide reasonable opportunity for providing access.
- The proposed use is water-dependent.
- Inherent security requirements of the use cannot be satisfied through the application of alternative design features or other solutions.
- The cost of providing the access, easement, or an alternative amenity is unreasonably disproportionate to the total long-term cost of the proposed development.

TABLE 4-1
Comparison of Existing and Proposed Shoreline Development Standards in Tukwila MIC

Standard	Existing Requirement ^a	Proposed Requirements ^b	
		Non-Water-Related Development	Redevelopment
Permitted uses	Zone district	Zone district	Zone district
River setback	50 feet from OHWM (may be reduced to 20 feet with public access)	60 feet	None if no horizontal expansion within river environment.
Maximum height within shoreline zone	35 feet ^c	Zone district ^d	Zone district ^d
Landscaping	5 feet around perimeter of parking areas	Zone district plus 10 feet along edge of 40-foot river environment.	Zone district plus 10 feet along edge of river environment where possible.
Impervious surface	Not regulated.	No net increase in river environment except mitigated shoreline stabilization ^e .	Same as for non-water-related uses.
Public access	Required where a County trail is proposed or where access has historically been provided; otherwise voluntary	Public access required along Green River Trail; employee access elsewhere (habitat restoration may be substituted).	Same as for non-water-related uses.
Shoreline stabilization ^f	Permitted (including vertical bulkheads) subject to certain design restrictions; must demonstrate need to protect existing structures or public improvements	Vertical bulkheads not allowed; stabilization projects must improve habitat.	Existing vertical bulkheads may be reconstructed in their current location; otherwise, same as for non-water-related uses.
Overwater buildings	Not allowed.	Not allowed.	May be redeveloped within the existing overwater footprint.
Parking	Not allowed between building and river.	Allowed between building and river, subject to limitations on impervious surfaces.	Same as for non-water-related uses.

^aAs set forth in King County SMP.

^bOnly selected requirements are shown here; see Table 2-1 for a complete list.

^cMay be increased under certain circumstances for water-related or water-dependent uses.

^d45 feet in MIC/L district; 125 feet in MIC/H district.

^eSome exceptions apply (e.g., public roads, utilities, and trails).

^fAs discussed in Chapter 2, shoreline stabilization projects (except redevelopment of existing facilities) are not included in the MIC implementation plan and remain subject to individual SEPA review, as well as other applicable agency approvals.

- Unacceptable environmental harm which cannot be mitigated will result from the public access.
- Significant undue and unavoidable conflict between any access provisions and the proposed use and/or adjacent uses would occur and cannot be mitigated.
- Fish habitat is restored at a ratio of 1 square foot of restoration to 1 square foot of required access area.

The basic area requirement for access is equivalent to a trail width of 16 feet times the length of the river frontage. For sites not along the Green River Trail, this requirement may be satisfied by new public access, employee access and amenities, connections from public areas to the river, or habitat restoration in lieu of access. If the site is along the Green River Trail, either connections to the trail or improved amenities (benches, interpretive signs, water fountains etc.) for public use shall be provided.

Habitat Restoration. Habitat restoration may be provided in lieu of City-required public or employee access, to mitigate increases in impervious surface area, or for projects not driven by City requirements. Habitat restoration will be based on concepts in the model ordinance for restoration prepared by the Duwamish Coalition (Appendix B). Key elements of the model ordinance include the following:

- The habitat restoration option is voluntary. Property owners may restore habitat either to mitigate loss, as an alternative to providing public or employee access, or for reasons beyond the scope and interest of the city. The quality of the habitat is subject to city approval. Restoration sites are to be located within the saltwater wedge.
- Offsite mitigation is allowed within the Lower Duwamish study area.
- Allowances are made for restoration of streams feeding into the Green/Duwamish River.
- Bank modifications are allowed if they do not change the location of the ordinary high water mark for regulatory purposes.

Requirements for Non-Water-Related Uses

Setbacks. Buildings serving non-water-related uses must be set back a minimum of 60 feet from the ordinary high water mark (OHWM). Parking and other normal site improvements may be located between 50 and 60 feet of the OHWM.

Overwater Construction. Overwater construction is prohibited.

Landscaping. A 10-foot-wide landscape strip must be provided between the river environment and site improvements. Native vegetation shall comprise a minimum of 30 percent of the materials in that landscape strip.

Shoreline Stabilization. New vertical bulkheads are not allowed. Shoreline stabilization is allowed, provided it improves fish and/or upland habitat by increasing areas that become inundated during high tide, planting native vegetation, or other techniques recommended by a qualified habitat specialist. The proposed SMP (Appendix B) provides some guidelines for shoreline stabilization incorporating habitat restoration. As noted in Chapter 2, however, new shoreline stabilization and other work waterward of the OHWM are not

included in the MIC implementation plan and will remain subject to separate SEPA review, as well as to other applicable permitting requirements.

Impervious Surface Area. No net increase in impervious surface area shall be allowed within the 40-foot river environment unless it is a part of an approved shoreline stabilization project or the lost impervious surface area is mitigated through habitat restoration. There will be certain exemptions from this standard, such as roads, bridges, pedestrian paths, and utilities.

Requirements for Redeveloping Uses

Setbacks. Existing buildings and facilities may be reconstructed in their present location. New buildings and site improvements shall be set back on the basis of their classification as water-dependent, water-related, or non-water-related.

Overwater Construction. Overwater reconstruction is allowed, provided the construction is contained within the footprint of the existing building that is being redeveloped.

Landscaping. Where possible, a 10-foot-wide landscape strip shall be provided between the river environment and improvements upland from the river environment. Native vegetation shall comprise a minimum of 30 percent of the materials in that landscape strip.

Shoreline Stabilization. Existing bulkheads may be replaced, provided they do not encroach further into the water. Unless otherwise necessary for the continued operation of the pre-existing use, any redevelopment of stabilization structures shall be designed to improve fish and upland habitat (see Appendix B).

Impervious Surface Area. Redevelopment within the 40-foot river environment shall not result in increased impervious surface area unless mitigated through habitat enhancement. There will be certain exemptions from this standard, such as roads, bridges, pedestrian paths, and utilities.

Other Jurisdictions

King County Shoreline Master Program

As discussed above, the City administers the 1977 King County shoreline regulations and will continue to do so until a new SMP is adopted. MIC shorelines are subject to King County's Urban Environment designation. The goals, policies, and objectives of the King County SMP include general directives for this designation, several of which are applicable to the study area:

- Emphasis should be given to developing visual and physical access to the shoreline in the urban environment (Policy 3).
- To enhance the waterfront and ensure maximum public use, industrial and commercial facilities should be designed to permit pedestrian waterfront activities consistent with public safety and security (Policy 5).
- Redevelopment and renewal of substandard areas should be encouraged in order to accommodate future users and make maximum use of the shoreline resource (Policy 6).

The King County shoreline regulations, summarized above in Table 4-1, include development standards for height, setbacks, and public access. The height limitation in the Urban Environment designation, unless the underlying zones are more restrictive, is 35 feet above average grade level (K.C.C. 25.16.030(B)). Provisions allow increased height if a substantial number of residential views are not obstructed, the height is allowed by the underlying zoning standards, and the use is water-dependent or water-related.

Commercial and industrial development is permitted provided that it is also permitted in the underlying zone. Non-water-related commercial and industrial uses must maintain a shoreline setback of either 50 feet from the ordinary high water mark or 20 feet from the floodway, whichever is greater. Non-water-related industrial uses may further reduce the setback if access to the shoreline is provided.

According to the King County shoreline regulations, "public access" means unobstructed access for the general public from land to the shoreline. "Limited public access" means that access to the shoreline is limited to specific groups of people or specific times, or that visual access is provided to the general public. The regulations require public access in the following circumstances:

Development proposed in shorelines of the state shall maintain setbacks, provide easements, or otherwise develop the site to permit a trail to be constructed or public access to continue where:

- There is a proposed trail in the King County Trail System; or
- Part of the site is being used and has historically been used for public access (K.C.C. 25.16.030(H)(1)(2)).

In addition to these limited requirements to provide new public access, the regulations also offer incentives for voluntary provision of public access. The setbacks identified above for commercial and industrial uses in the Urban Environment designation can be decreased if public access is provided. The setback can be reduced to 20 feet from the ordinary high water mark or 10 feet from the edge of the floodway, whichever is greater, if the development provides limited public access. The setback can be reduced to 10 feet or the edge of the floodway if full public access is provided.

U.S. Army Corps of Engineers Section 404 and Section 10 Permits

The Corps regulates projects occurring within waters of the United States, including wetlands, under the authority of the Clean Water Act. The Section 404 permit is required for the discharge or excavation of dredged or fill material waterward of the ordinary high water mark (or, in tidal waters, the mean higher high tide line). Mechanized land clearing in waters of the United States is also subject to regulation through the Section 404 process. The Section 10 permit is required for any work in or affecting navigable waters of the United States and would be required for projects in the MIC downstream of the Turning Basin.

Typically, the Corps permits are issued with a set of conditions designed to minimize and mitigate impacts to water quality and habitat. Restoration of disturbed areas to a condition equal to or better than their existing condition is generally required, with a monitoring plan used to ensure that the restoration is successful.

Washington State Department of Ecology Water Quality Certification, Temporary Exceedance of Water Quality Standards Approval, and NPDES Construction Stormwater Discharge Permit

Like the Section 404 permit, the Section 401 Water Quality Certification is issued under the authority of the Clean Water Act. It is required for all projects with a Section 404 permit and is approved in conjunction with 404 permit approval.

The Temporary Exceedance of Water Quality Standards approval and the NPDES Construction Stormwater Discharge Permit are both used to minimize the potential impacts of project construction on water quality, primarily erosion and sedimentation into nearby surface waters and wetlands. Approvals require that a plan be prepared to specify methods for minimizing erosion and sedimentation, typically through the application of "best management practices" such as the use of silt fences, covering of stockpiled soils, and prompt revegetation of disturbed areas.

Washington State Department of Fisheries and Wildlife Hydraulic Project Approval

The Hydraulic Project Approval (HPA), administered by WDF&W, is perhaps the most important permit for the protection of aquatic resources and habitat. It is required for any project that will use, divert, obstruct, or change the natural flow or bed of any fresh or salt water of the state. This includes all construction or other work waterward and over the ordinary high water mark, including dry channels, and may include projects landward of the ordinary high water mark if they have the potential for direct impacts on fish life and habitat. In addition to requiring restoration of lost habitat resulting from development projects, the HPA specifies time periods when in-water work may and may not occur, based on the life cycles of fish species present in the water body.

Impacts

This section describes changes in shoreline use that would take place under the three prototype projects for the MIC implementation plan, as described in Chapter 2. These changes can generally be described as development or redevelopment consistent with existing planning and zoning for the area. After the prototype site discussion, the overall implications of the MIC implementation plan for shorelines in the corridor are addressed. Issues raised by the prototype sites with respect to other land use plans and regulations are discussed in Chapter 3 of this document.

Prototype Site 1

As described in Chapter 2, Prototype Site 1 would involve the development of 175,000 square feet of research and development, lab, and office uses in a single building located across South 112th Street from the Boeing Customer Service Center. The site borders the Duwamish River just north of the Green River Trail pedestrian bridge, adjacent to the North Wind Weir. As shown in Figure 2-4, the proposed 125-foot-high building would be set back 60 feet or more from the shoreline edge, consistent with proposed Tukwila SMP requirements; no impervious surface (e.g., parking) is proposed within the 40-foot river environment. Landscaping would be provided consistent with the MIC development standards in Table 4-1.

Under the proposed development standards, the project would have to include either onsite employee public access or habitat restoration in lieu of such access. As described above under "Existing Conditions," the shoreline area of the site contains significant woody riparian vegetation and adjacent mudflats and is designated as a potential habitat restoration area (Site R-18) in the city's shoreline inventory. However, since habitat restoration is voluntary under the proposed regulations, the developer would be under no obligation to substitute it for the access requirements. Furthermore, the proposed shoreline landscaping requirements would allow for removal of all native vegetation, as long as replacement vegetation requirements of the code were met, and no provisions exist in the SMP for direct replacement of riparian habitat loss through development. Thus, buildout of the site under the shoreline regulations as proposed could result in the elimination of riparian habitat identified as having high potential for restoration. If no work took place below the ordinary high water mark, permits from state and federal agencies would not be required, and there would be no additional regulatory basis for mandating mitigation.

As discussed elsewhere in this chapter and Chapter 2, new shoreline stabilization and other new development waterward of the OHWM are not included in the MIC implementation plan. Such projects require careful consideration of habitat issues specific to the site and invoke a number of permitting processes by state and federal agencies, as described above; in these cases, the additional discretionary authority provided by SEPA is an invaluable tool in administering the balance between natural and built environments. For this reason, no bank or in-water improvements are assumed at Prototype Site 1. However, to test the potential for such impacts under the new regulations, a separate MIC shoreline impact analysis (Partee, 1997) was prepared for the City of Tukwila and is included as Appendix B-2. The result of this analysis was a set of design guidelines for shoreline stabilization improvements, included as Figures 3 through 6 in the proposed SMP (Appendix B-1). The guidelines demonstrate how habitat enhancement features can be incorporated into shoreline stabilization projects. Figure 6 of the SMP illustrates a treatment designed specifically for Prototype Site 1.

Another impact of development under the new regulations, as compared to the King County SMP, is the elimination of the 35-foot height restriction, with allowed heights reverting to the underlying zoning. The 125-foot maximum height in the site's MIC/H zone district is almost four times that permissible under the existing regulations. Although, as noted in Chapter 3, the unified nature of the development and adherence to setback and landscaping standards could make the developed site more aesthetically pleasing than under existing conditions, the bulk and scale of the larger building would change the visual character of the shoreline area. Policy 5.3.1 of the Comprehensive Plan shoreline element calls for the development of river design guidelines; however, these guidelines are not currently part of the proposed code. With the elimination of BAR design review, this would leave the MIC without design standards for shoreline development and in conflict with shoreline policy 5.5.2, which requires that such development be consistent with shoreline design guidelines and maintain or enhance existing visual quality along the river.

Construction of the proposed facilities under this scenario would have the potential to result in short-term (construction period) and long-term (operational) impacts to water quality in the river. Stormwater runoff over exposed soils during construction could result in those soils being carried into the river in runoff, with possible effects including siltation in the river channel that would adversely affect aquatic habitat. During operation, storm-

water runoff quantities and velocities would increase through the addition of impervious surfaces for buildings and parking. However, these impacts are not expected to be significant. Stormwater pollution prevention plans, required by Ecology and by the City's Land Alteration Ordinance (discussed in Chapter 6), require the use of best management practices to minimize erosion and sedimentation. As the site is already developed, any increase in impervious surface would be small and would not produce significant increases in peak stormwater flows or velocities in the City's storm drainage system, where runoff would be channeled.

Prototype Site 2

Prototype Site 2 lies entirely outside the shoreline area, and thus would have no impacts.

Prototype Site 3

Shoreline development issues for Prototype Site 3 are generally similar to those for Site 1. In most instances the impacts of Site 3 redevelopment would be somewhat lower, since it would take place on an already fully developed facility and would not involve the potential for impacts to an identified habitat restoration area. The primary difference between the issues for Sites 1 and 3 would be redevelopment of the large overwater structure that currently exists on the latter site.

As discussed above, the proposed revisions to Tukwila's shoreline development standards allow for redevelopment of overwater construction, though they do not allow new construction over the water. Because the MIC/H height limits are proposed to apply throughout the shoreline zone regardless of distance from the water, the structure could be rebuilt on its current footprint to a height of 125 feet; this is the condition assumed for the scenario. The existing vertical bulkhead would also require reconstruction, another activity allowed for redevelopment but not for new projects. This would necessitate in-water work in the channel of the Duwamish Waterway, triggering requirements for the state and federal permits described above.

The building height increase to 125 feet would be primarily an issue of aesthetic concern, which would best be addressed through adoption of riverfront design guidelines, as recommended in the shoreline policies and discussed under Prototype Site 1. Although the greater height could cause a slight additional amount of shading in the waterway—a potential impact on fish habitat—such shading would be much less than if the overwater footprint of the building were increased. Restrictions on bulkhead replacement in the proposed shoreline regulations would ensure that the new bulkhead did not impinge farther into the waterway than the existing one and would further require that habitat be improved in conjunction with the replacement. Figure 2 from the proposed SMP (Appendix B-1) shows a design for providing habitat improvements in the redevelopment of overwater structures.

Because the habitat next to the site is marginal, it is possible that the required habitat improvements would take place at an offsite location. The proposed shoreline development regulations suggest that opportunities exist for such offsite replacement, but do not include restoration design standards or establish specific linkages between the type of impact and the appropriate restoration activity and location. The requirements of the HPA and Section 404 permits may address some of these issues, but the most effective way for the City to

effect the restoration of identified sites would be through the development of more specific habitat restoration and enhancement guidelines that could be administered in tandem with these permitting processes.

In its 1992 redevelopment proposal, the Boeing Company included provisions for employee public access as part of Site 2 redevelopment. Under the proposed Tukwila regulations this type of access would still be required, but could be replaced at Boeing's discretion by an equivalent square footage of habitat restoration. If this option were chosen, the additional habitat value provided at an offsite restoration site could increase the potential positive impacts of the project on the Duwamish ecosystem.

Construction in the Duwamish Waterway at Prototype Site 3 for replacement of the existing bulkhead could result in a number of temporary impacts, including localized turbidity and disturbance of intertidal or subtidal sediments. Because of the long history of industrial activity along the waterway—much of it before the adoption of current regulations governing the discharge of waste materials into surface waters—sediments in the area are known to be contaminated with a variety of constituents, including metals, polycyclic aromatic hydrocarbons (PAHs), and other substances. The disturbance of these sediments during bulkhead replacement may result in the resuspension of contaminants in the water column, with potentially toxic effects for aquatic organisms. Such impacts would be minimized, however, through the Section 401 and 404 permitting processes, which would specify as permit conditions construction techniques to reduce sediment disturbance. If deemed necessary, for example, the area immediately surrounding the bulkhead could be isolated by a cofferdam while work was taking place to contain disturbed sediments within a limited area. Any impacts during construction would be short-term; turbidity and any resuspended contaminants would subside when the work was complete.

Corridor-Wide Issues

As noted in Chapter 2, the prototype sites exemplify the likelihood that, under the MIC implementation plan, land uses in the corridor will intensify over time toward the limits allowed under current planning, zoning, and shoreline regulations. Within the MIC shoreline area, this has a number of implications:

- Because of the elimination of the 35-foot height limitation under the King County SMP, overall bulk and scale along the shoreline will increase over time. These increases will be most significant in the areas within the MIC/H zoning district, where heights of up to 125 feet are allowed (see Figure 3-2). The river design guidelines called for in the shoreline element of the Tukwila Comprehensive Plan would provide an avenue for addressing the aesthetic impacts of these changes in the shoreline zone.
- As areas along the shoreline develop or redevelop, opportunities for increased protection and/or restoration of habitat will be afforded by the proposed shoreline development standards. However, without clear specifications and standards for offsite habitat enhancement and provisions for preservation of onsite habitat in areas of identified value, cohesive and effective use of these opportunities may not be realized.
- Current state and federal regulations and permits will continue to govern in-water work, affording aquatic resource protection not otherwise mandated by the City.

- Public access (particularly for site employees) will generally be enhanced by the proposed standards, as current King County regulations do not require it except in areas designated for trail development within the county's system.

In sum, the proposed shoreline development regulations would afford more protection for the shoreline environment in some ways—particularly with the adoption of design standards and the strengthening of habitat improvement linkages—but overall would serve to facilitate and intensify development in keeping with the city's policies and goals for the corridor.

No Action Alternative

Under the No Action alternative, Tukwila would complete and adopt the proposed SMP as a separate action subject to its own SEPA review process. In the interim, the city would continue to administer the existing King County shoreline regulations within the MIC. Because these regulations generally defer to the underlying zoning for permitted uses, the types of development allowed would remain the same and would continue to be guided by the MIC policies adopted as part of the Tukwila Comprehensive Plan. Certain restrictions would apply in the shoreline area that would be eliminated by the MIC implementation plan; in particular, the 35-foot height restriction would remain in place, reducing the scale of riverfront development as compared to allowable levels under the implementation plan. Another significant difference would be the continuation of BAR review of shoreline project design. Taken together, these elements of the existing regulatory process would tend to maintain, rather than intensify, the character of existing riverfront development, somewhat in conflict with the policy direction of the Comprehensive Plan and proposed SMP guidance for the MIC.

As discussed above under "Corridor-Wide Issues," the proposed shoreline regulations would afford a greater degree of public access and aquatic habitat protection than currently exists. Although development under the requirements of the MIC implementation plan would not of itself "turn back the clock" on habitat and access loss on a long-industrialized waterway, Comprehensive Plan and SMP goals for restoring habitat and promoting access would be better realized under MIC implementation than under No Action.

Mitigation Measures

The following measures are proposed for adoption into the new Tukwila shoreline development regulations to strengthen shoreline protection within the context of an industrial waterfront:

- Develop and adopt river design guidelines to be used in administrative review of shoreline development proposals, as called for in the shoreline element policies of the Tukwila Comprehensive Plan. The guidelines would be administered through the shoreline substantial development permit process.
- Formally designate the six habitat preservation and restoration sites identified above as part of a habitat restoration program, and protect them from development through the establishment of easements or similar measures. Adopt the habitat restoration policies and model ordinance included in the Lower Duwamish Habitat Restoration Plan; add refinements as necessary to link restoration guidelines with identified sites in ways that

will be predictable for developers and enforceable by the City and will concentrate restoration activities in appropriate areas.

- Incorporate compliance with federal and state regulations governing aquatic resources into the performance standards for the shoreline overlay district.
- Incorporate regulations into the new Tukwila SMP that implement the intent of the SMP policy changes recommended in Appendix B-2 to protect and enhance aquatic habitat.
- Incorporate policies and regulations into the new SMP to formalize implementation of the Green River Trail Plan and identify construction, improvements, or connections to the designated trail as a public access requirement for adjacent properties.

Unavoidable Adverse Impacts

Under the planned action, the intensity and scale of development along the Duwamish River shoreline are likely to increase over time in a manner consistent with regional and local land use plans and policies.

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Transportation

Introduction

A transportation analysis has been prepared for the MIC to assess the impacts of future development on supporting transportation systems serving it. The impact analysis includes a survey of existing conditions, a review of future background conditions, a study of cumulative effects associated with the implementation plan, and an analysis of mitigation measures recommended to serve future development.

Because the implementation plan would affect the processes involved in the city's development review effort, existing ordinances, standards, and processes may require revisions. This section addresses potential approaches that could be considered in adapting these processes to the planned action framework.

Existing Conditions

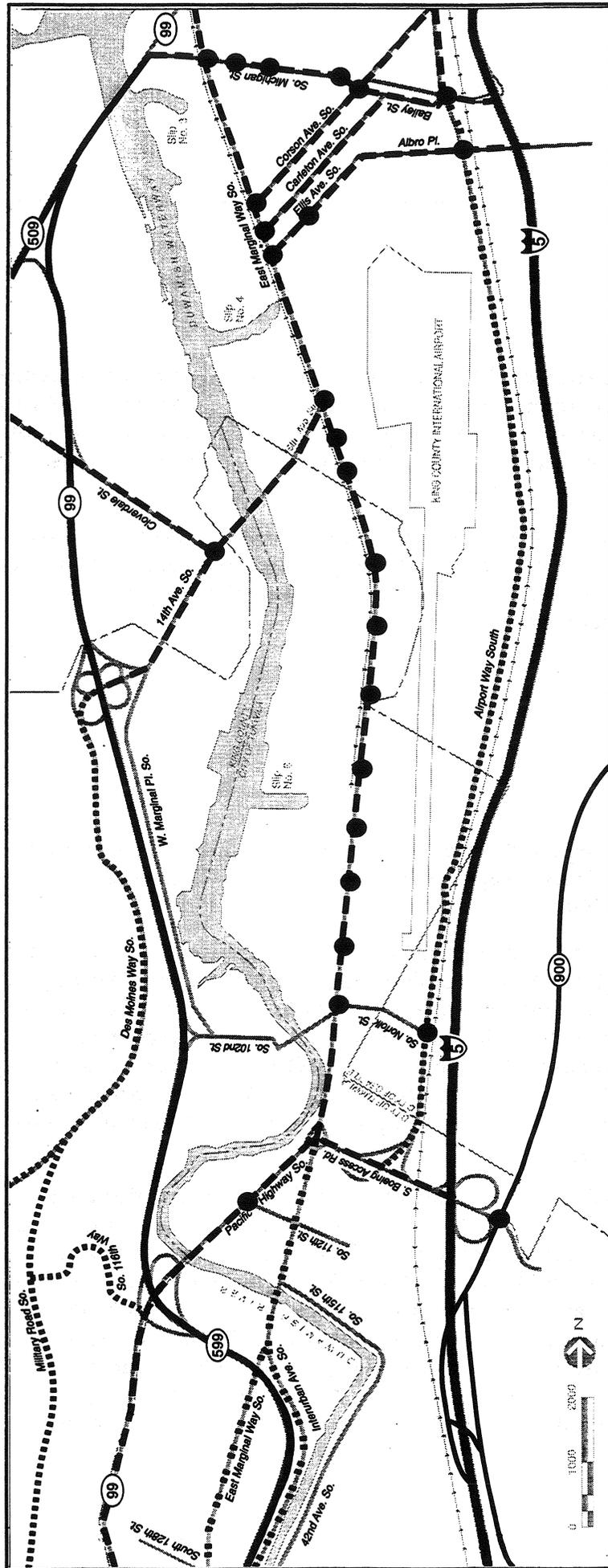
Vehicular Circulation

Street System

The arterial roadway system serving the study area is illustrated in Figure 5-1, which also shows Cities of Seattle and Tukwila roadway functional classifications and locations of traffic signals on roadways in the vicinity.

Access between the project area and I-5, SR 99, and SR 599 is currently provided by East Marginal Way South, Pacific Highway South, South Boeing Access Road, 16th Avenue South, Airport Way South, and Interurban Avenue South. The South Boeing Access Road interchanges provide access to I-5 both north- and southbound. A full cloverleaf interchange at 14th/16th Avenue South provides direct access to SR 99. The Oxbow interchange connects South 102nd Street to SR 99. It currently operates as a partial interchange, with northbound on- and off-ramps from SR 99. Pacific Highway South connects to SR 99 and SR 599 with a full-access interchange.

Major east-west corridors within the study area are the South Boeing Access Road, East Marginal Way, and Pacific Highway South. The main east-west corridor along the south side of the study area is the South Boeing Access Road. This six- to seven-lane principal arterial provides direct access to I-5 and Pacific Highway South/SR 99. Parking is prohibited on both sides of the roadway, and the speed limit is posted at 30 mph. The roadway pavement is in fair condition, and sidewalks are provided on both sides of the roadway. The intersection of South Boeing Access Road at East Marginal Way South/ Pacific Highway South is controlled by signal. West of East Marginal Way South, South Boeing Access Road becomes Pacific Highway South. This five-lane principal arterial provides direct access to SR 599.



LEGEND

- Freeway
- - - Principal Arterial
- Minor Arterial
- . - . Collector Arterial
- Signalized Intersection

Source: City of Tukwila, City of Seattle, and WSDOT.

**Figure 5-1
Existing Roadway System**

North-south corridors are East Marginal Way South, 16th Avenue South, and Airport Way South. East Marginal Way South is six lanes in Seattle with three northbound travel lanes, two southbound lanes, and a center two-way, left-turn lane. South of South 96th Place, the newly constructed East Marginal Way becomes a seven-lane roadway with two-way, left-channelized, left-turn lanes. North of the South Boeing Access Road, nine travel lanes are provided, five southbound and four northbound. The pavement surface is in good condition, and the speed limit is posted at 35 mph. South of the South Boeing Access, East Marginal becomes a two-lane collector arterial with fair pavement conditions.

The principal arterial providing access from East Marginal Way South to SR 99 is 16th Avenue South. This arterial is a four-lane roadway with two travel lanes in each direction crossing the Duwamish River. Major intersections along 16th Avenue South are controlled by signals. There is a pedestrian tunnel crossing under 16th Avenue South at a Boeing entrance, approximately 400 feet west of East Marginal Way South. The pavement surface is in good to fair condition, and the speed limit is 30 mph.

South 112th Street provides east-west travel between South Pacific Highway and East Marginal Way. Classified as a local access road, South 112th Street has signal control at Pacific Highway South and stop sign control at East Marginal Way. This is a two-lane roadway with sidewalks on both sides and a speed limit of 25 mph. The pavement is in fair to good condition. No access is provided on the north side of the road. South 112th street is owned by the City of Seattle at this location, as a major water supply transmission line is located below the pavement. Use of the road by vehicular traffic is allowed via easement.

Traffic Volumes

Existing daily and peak-hour traffic volumes were based on the April 1991 data assembled from the East Marginal Way South Design Report (Entranco) and 1994 City of Seattle data. Traffic volumes were expanded to 1997 by applying the City of Tukwila traffic count control data. The control data are recorded monthly at the following locations:

- East Marginal Way South, south of the Museum of Flight
- South Boeing Access Road, east of East Marginal Way
- Pacific Highway South, north of South 139th Street

The control data indicated that daily traffic volumes in the MIC area have decreased by approximately 9 percent from 1991 to 1996. Figures 5-2 and 5-3 summarize the 1997 p.m. estimated peak hour traffic volumes for 2:30 to 3:30 and 5:00 to 6:00. Two peak hours are represented: one for Boeing Manufacturing shift changes, and another to address the standard commuter peak. The daily arterial volumes range from a high of 34,800 vehicles per day (vpd) on South Boeing Access Road and 22,900 vpd on East Marginal Way South at the Museum of Flight to a low of approximately 3,300 vpd on South 112th Street and 8,700 vpd on East Marginal Way South, south of the South Boeing Access Road. The 2:30 to 3:30 and 5:00 to 6:00 afternoon peak-hour volumes on East Marginal Way typically range from 13 percent to 9 percent of the daily volumes, respectively.

On the regional roadway system, I-5 has the highest volume of traffic in the project vicinity, carrying approximately 195,800 vpd north of the South Boeing Access Road. Other major facilities carry an average 30,600 vpd on SR 99, 40,000 vpd on SR 509, and 27,500 vpd on

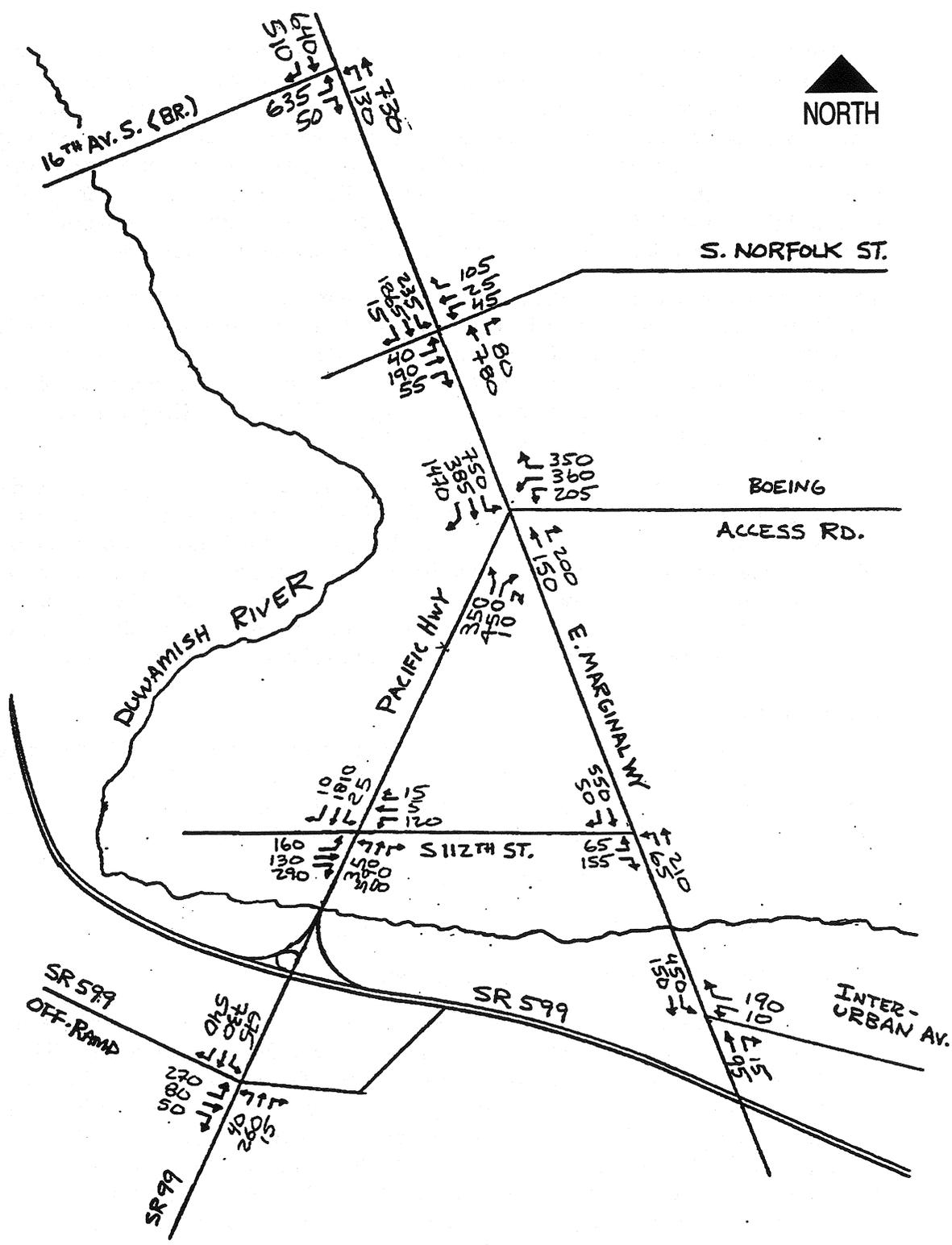


Figure 5-2
Existing 1997 Traffic Volumes
2:30 to 3:30 PM Peak Hour

SR 599. Traffic growth on major facilities has ranged from a 2 percent increase to a 1 percent decrease annually over the past 5 years. Traffic on these roads is predominantly northbound during morning peak periods and predominantly southbound during afternoon peak periods.

Level of Service (LOS)

LOS is a concept developed to quantify the degree of comfort afforded to drivers as they travel through an intersection or roadway segment. The degree of comfort includes such elements as travel time, number of stops, total amount of stopped delay, and impedances caused by other vehicles. Six grades are used to denote the various levels of service. They range from LOS A, which represents the best condition where little or no delay is experienced, to LOS F, where extreme congestion is experienced. LOS F describes forced-flow operation at low speeds where traffic volumes exceed roadway capacity. These conditions usually result from queues of vehicles backing up from a restriction downstream of the intersection. Speeds are reduced substantially, and stoppages may occur for short or long periods of time. LOS F is reached when the stop delay at signalized and stop sign-controlled intersections exceeds 60 and 45 seconds, respectively.

Some agencies have established LOS standards for roadways within their jurisdictions. LOS standards can differ by area of a city or neighborhood in response to land use or other policy objectives (for example, allowing LOS F in a downtown area but not in neighborhoods). The City of Tukwila has adopted a minimum LOS standard of E for East Marginal Way South and Pacific Highway South in the MIC.

For this analysis, the existing 1997 LOS at signalized intersections was estimated using the 1994 update of the Highway Capacity Manual. Results are presented in Table 5-1.

TABLE 5-1
1997 PM Peak Hour Level of Service Summary

Study Intersections	2:30 to 3:30 PM		5:00 to 6:00 PM	
	Delay	LOS	Delay	LOS
E. Marginal Way & 16th Ave. S.	15	C	16	C
E. Marginal Way & S. Norfolk St.	12	B	10	B
E. Marginal Way & Boeing Access Rd.	23	C	28	D
Pacific Hwy. S. & S. 112th St.	>60	F	18	C
Pacific Hwy. S. & S. 116th On Ramp	12	B	11	B
E. Marginal Way & Interurban Av. S.	7	B	7	B
E. Marginal Way & S. 112th St.*	14	C	25	D

Delay in seconds

* Intersection is unsignalized

Accidents

The most current accident data gathered from the City of Tukwila covered January 1, 1993, through December 31, 1995. For the 3-year period, there were 127 accidents on the arterial

roadway system within the study area, an average of approximately 0.7 accident per day, with 72 injuries and no fatalities. Most of the accidents were right-angle or rear-end, typical of accident patterns for urban areas.

The street section with the highest accident experience was along East Marginal Way South between South Boeing Access Road and South Norfolk Street, where there were 66 accidents over 3 years. Most of these accidents involved angular and head-on collisions. A total of 37, with no fatalities, was reported. No pedestrian accidents were reported.

East Marginal Way from 1992 to 1995 experienced an average accident rate of 2.29 accidents per million vehicles miles.

Parking

There is no on-street parking along the principal arterial roadways in the vicinity of the study area. Surrounding neighborhoods typically allow on-street parking.

There are currently about 18,000 parking spaces available for employees and visitors of the Boeing Company. All parking spaces are provided free of charge, although some locations are assigned and require special permits.

Estimates of existing peak parking demand were calculated by dividing actual first-shift employee population (estimated at 17,000) by the observed average vehicle occupancy (AVO) of 1.2 persons per vehicle. This rate is based on surveys conducted by the Boeing Company and Entranco in June 1991. Existing peak parking demand for long- and short-term spaces is approximately 12,400 spaces. This indicates an existing surplus of 5,600 spaces. Peak parking demand is likely to occur at shift change, when first-shift workers are yet to leave and second-shift workers are just arriving.

Transit Service

Transit service in the study area is provided by Metro. There are 11 bus routes serving the MIC. The bus route numbers include: 34, 40, 60, 108, 124, 154, 170, 173, 174, 184, 246. Direct service is provided to the University District, Capitol Hill, downtown Seattle, Bellevue, Redmond, Kirkland, Issaquah, Renton, Kent, Sea-Tac, Allentown, Tukwila, Des Moines, Federal Way, and Georgetown. Other routes require transfer via downtown Seattle.

For the most part, service is provided from 5:00 a.m. to 6:00 p.m. daily, including weekends. Evening and late-night service is provided on some routes. Peak-hour service is good, with buses traveling to many urban locations in King County at 15- to 30-minute intervals. Routes 124 and 174 are regular routes; the remainder are rush-hour routes. Service to outlying urban areas of the county is generally commuter-oriented. Off-peak service to many outlying areas is less frequent or not available.

Non-Motorized Travel

Pedestrian signals and crosswalks operate in selected directions at some signalized intersections in the study area. Crosswalks and pedestrian signal heads are not present at every leg of every intersection. Sidewalks are intermittent along the length of the corridor. Currently, continuous sidewalk is provided on South Pacific Highway from South 112th Street to the Duwamish River bridge. Covered walkways are occasionally provided from transit stops and parking lots. Pedestrian walking distances are typically long, up to 1,000 feet

from parking lots to the work site, and longer from transit stops to work sites. There are two pedestrian tunnels across East Marginal Way South. In the MIC, East Marginal Way and South Pacific Highway are designated for future bike trails.

Goods Movement

Rail Transportation

A major railroad line is located just east of Airport Way South. This line connects the major rail facilities in Renton and Tukwila with railyards in the Duwamish industrial area. Spur lines run north-south along the west side of East Marginal Way South, serving the industrial area between the Duwamish River and East Marginal Way South and the study area. Burlington Northern/Santa Fe Railroad provides freight service to industrial sites on an as-needed basis one to two times per day, 7 days per week. No other railroad companies operate along this spur line, which extends south almost to the Museum of Flight.

Truck Traffic

There is convenient access for trucks from the study area to I-5 and SR 99. Truck traffic along East Marginal Way South constitutes approximately 1 to 9 percent of the total traffic; truck traffic volumes within the study area range from 1 to 20 percent of the total traffic.

Air Transportation

The proximity of the Sea-Tac and King County (Boeing Field) airports provides easy and direct access to air cargo facilities. Boeing Field is located within the study area. It serves as a base for many private aircraft and as a center for Boeing commercial and military test flights. The airport is occasionally used to accommodate commercial airliners diverted from Sea-Tac Airport due to unexpected weather conditions.

Planned and Programmed Improvements

A number of transportation system improvements in the study area are planned by King County, the City of Seattle, and the City of Tukwila. Descriptions of the planned improvements are provided below.

BNSF Rail Yard

The BNSF rail yard is located in the southeast corner of the MIC. Access to the yard is currently provided by South 124th Street, a two-lane road that requires trucks bound for the yard to travel through a single-family residential area and between the residences and the new Tukwila Community Center complex (48,000-square-foot community center, softball field, tennis courts, trail access, play area, and soccer field).

South 124th Street currently carries about 7,000 vehicle trips per day, with about 1,300 (19 percent) being heavy truck trips. The City of Tukwila projects a 3 percent compound annual growth rate for all vehicle trips. This would be about 12,000+ trips on South 124th Street in 2015.

Level of service at the 42nd Avenue/South 124th Street intersection is currently LOS F. With signalization, the 2015 LOS is projected to be LOS B. Level of service at the 50th Place

South/South 124th Street intersection is currently LOS C, and is anticipated to be LOS F in 2015. LOS F is an unacceptable level of operation.

BN/SF currently estimates about 1,600 truck trips per day between 42nd Avenue South and the rail yard, with as much as an annual average 3 percent growth rate over the next 5 years (=15 percent) increase in truck traffic. This is an estimated 1,840 truck trips per day by 2003. If the City's compound annual growth rate is applied, the resulting estimate would be similar (i.e., 1,854 trips). BNSF and city traffic projections are consistent, at least over the next 5 years.

A significant conflict exists between truck access to the rail yard and the residential recreational, and pedestrian traffic generated by the single family housing and community center, by both current and projected traffic volumes. The level of conflict should be expected to significantly increase as a result of Allentown redevelopment to about twice its existing, single family density. What, if any, improvements can be implemented to mitigate these conflicts to an acceptable level should be explored further in conjunction with BNSF staff. No design solutions for South 124th Street are readily apparent at this time.

Options to provide for adequate traffic flow and pedestrian safety include a new bridge across the river from the Gateway industrial area (identified in the City's 6-year Capital Improvement Plan), or a north access to Airport Way or Boeing Access Road. A third option, suggested by BNSF, would be to improve the current S. 124th Street access route, to address existing negative impacts. In the interim, the City is pursuing a commitment from BNSF to cooperatively explore alternative solutions.

Pacific Highway South Duwamish River Bridge

The Pacific Highway South bridge will be replaced with a five-lane section bridge with trail and sidewalk.

Pacific Highway South and South 116th Street

Pacific Highway South will be widened to provide southbound dual left turn lanes onto the SR 599 on-ramp, as well as ramp revisions to better accommodate terms and meet design standards. The city anticipates a combination of funding from previous mitigation requirements and grant funding for this project.

16th Avenue South Bridge

The 16th Avenue South bridge over the Duwamish River has deteriorated and will have to be reconstructed or closed. This project is currently under study by King County and the City of Tukwila. The exact alignment for the new structure has not yet been determined. The Tukwila Transportation Plan update, currently underway, will provide additional information on this issue, including an estimate of the origins and destinations of vehicles using the bridge. This origin and destination study will be important in helping determine Tukwila's appropriate role in funding ongoing costs for the bridge's operation. Options include significant participation by the city in the major renovation or reconstruction of the bridge; continued funding of the bridge's annual operation and maintenance costs (now split evenly with King County); or reduced funding compared to current levels. Insufficient funding for bridge operation and maintenance raises the real possibility of bridge closure for safety reasons.

The City Council will review the origin and destination study results and will determine which option or combination of options to pursue after further discussions with nearby jurisdictions, area businesses, and citizens.

Interstate 5 HOV Improvements

In the project vicinity, inside HOV lanes exist from Seattle through Tukwila to SR 516 in Des Moines. WSDOT currently is extending inside HOV lanes south to Pierce County. This project is currently under construction.

Regional Transit System

In November 1996, voters in the urbanized portions of King, Pierce and Snohomish Counties approved creation of a Regional Transit Authority (RTA) to implement commuter rail service, construct light rail transit (LRT), and operate regional bus services. The RTA expects to initiate commuter rail service between Seattle and Tacoma by the year 2000, using the Burlington Northern-Santa Fe (BNSF) railroad corridor that runs adjacent to Airport Way South. The RTA plan includes a commuter rail station location in the vicinity of the Boeing Access Road.

Construction of the LRT facilities would begin after the year 2000. The line would extend from the University District to Capitol Hill and downtown Seattle, and then continue south along Rainier Avenue to the Boeing Access Road and to SeaTac Airport. At the Boeing Access Road location, a shared commuter rail/LRT station may be developed to facilitate intermodal transfers.

As noted in Chapter 2 of this EIS, the siting of a rail maintenance yard, commuter rail station, or shared commuter rail/LRT station could have significant implications for the MIC, for Tukwila, and for the region. Specific concerns related to potential RTA facilities near the Boeing Access Road include possible loss of tax base and introduction of potentially significant congestion on a major access route to and from the MIC, an industrial area that relies heavily on truck access for movement of goods into and out of the Duwamish Corridor.

To the south, two alternative routes are being considered. One would continue along SR 99 to SeaTac. The other would route the LRT along Interurban Avenue and Pacific Highway South. Issues related to LRT alignments and station locations will be determined in a series of engineering and environmental studies to be conducted over the next 4 years.

Existing Plans and Regulations

The City of Tukwila employs a variety of tools in processing development applications by landowners. Traditionally, these processes included the application of zoning standards, the issuance of building permits, and enforcement of health and safety criteria for infrastructure. With the adoption of SEPA in 1971, and its 1984 implementing rules, local governments were given the authority to review area-wide impacts to the natural and manmade environments and to establish mitigation requirements for individual development projects. SEPA, in its evolution over the last two decades, has become the cornerstone of development review functions in many communities, Tukwila included.

Under SEPA, transportation issues are frequently analyzed through the checklist submittal which documents the site access, parking, and trip-making characteristics of a development proposal. Small projects are frequently exempt from further review under SEPA. Larger

projects may require submitting an expanded checklist or a full EIS that addresses a wide range of transportation policy topics, project-related issues, and cumulative and secondary impacts. These concerns are generally identified during the public scoping process and form the basis for the subsequent transportation analysis.

Typically, the SEPA transportation analysis encompasses vehicular traffic flow, including capacity and safety, transit modes, truck travel, bicycle and pedestrian travel, and parking supply and demand. For some projects, rail, air, and water transportation also are addressed. Mitigation for adverse impacts often consists of frontage improvements, dedication of right-of-way for street widening, or street or signal improvements at some distance from the site.

In its analysis of impacts and mitigation, SEPA has provided the basis for determining exactions related to individual development projects. These exactions represent the fair share contribution to mitigation established in the traffic analysis. As public funding for transportation projects diminished during the 1980s, SEPA was increasingly used to secure private participation in street and roadway projects. Some communities further formalized these processes by establishing fee schedules for new development that would fund citywide or districtwide transportation improvements.

With the passage of the Growth Management Act in 1990, cities were required to develop and adopt comprehensive plans, including land use and transportation elements. A capital improvement plan was required to assure that transportation improvements were financially feasible. The act also established criteria for formal adoption of impact fees for public services.

The GMA also introduced the concept of concurrency into planning for the transportation infrastructure. Broadly translated, this means that transportation improvements associated with development should be in place at roughly the time of occupancy of the project. In practice, the Act specified that improvements be implemented within 6 years of project completion, recognizing the complexities of public works programming and staged construction of many development projects. The 6-year time frame also represents the typical planning cycle for an annual update of the transportation improvement plan for many communities.

In Tukwila, the concurrency requirements are embodied in Ordinance No. 1769. It sets level of service standards to be maintained on major corridors within the city. These standards apply, in some cases, to average levels of service at the intersections and links along the corridor. On East Marginal Way north of South 112th Street to the city limit, and on Pacific Highway South from South 152nd Street to Boeing Access Road, a minimum LOS E is set.

Requirements for traffic studies are established in the concurrency ordinance. Projects with more than five peak-hour trips must include studies and are subject to the city's mitigation fees. The mitigation payment schedule is included in the transportation element of the city's Comprehensive Plan and is updated periodically. The schedule provides for fair share payments dedicated to street improvements in each of several districts or corridors within the city. No fee schedule currently exists in the MIC zone.

Payment under the fee schedule satisfies obligations to contribute to area-wide improvements identified in the transportation plan. Other site access and frontage improvements serving the site are the responsibility of the property owner. These improvements must be

in compliance with the provisions of the city's design standards for construction in the public right-of-way. The City of Tukwila's infrastructure design and construction standards address requirements for street width, curb radii, pavement thickness, and other construction details.

The city's zoning code regulates off-street parking and loading design. It specifies the number of required parking and loading spaces, including handicapped parking, and standards for their layout. It also specifies standards for driveway location. Other aspects of driveway layout are subject to approval by the Public Works Director. A separate ordinance specifies the locations and widths of sidewalks.

In instances where an individual development creates adverse capacity or safety impacts, requiring improvements beyond those anticipated in the transportation plan, those improvements become the full responsibility of the developer. Such improvements can be financed through a latecomer's agreement in which the developer can recover a share of the investment in infrastructure improvements from subsequent beneficiaries of the improvement. Alternatively, the developer can postpone the project until actions to fund the capacity or safety improvements are taken.

Impacts

Introduction

The implementation plan for the Tukwila MIC will provide for expedited review of individual development projects without the requirement for specific project-level SEPA review for those projects that conform with this MIC subarea plan. This study constitutes the SEPA analysis for the cumulative transportation impacts of future development in the zone.

Future activity in the MIC could consist of development of the few remaining vacant parcels or redevelopment of existing uses. The allowable uses in the district include manufacturing, warehousing, research and development, and offices. Office uses are generally constrained to less than 20 percent of the floor area. Many workers in the district are employed in shifts.

For the transportation analysis, future conditions are examined for 2010, with and without the proposed implementation plan. Future background conditions for vehicular traffic were developed using growth rate techniques and include a comparison with projections from area-wide traffic forecasting models. These projections consider future traffic operations during the afternoon peak and the evening commute hours.

The project analysis makes use of three prototype scenarios intended to demonstrate the range of potential uses for typical sites in the district. Prototypes were selected to represent both development and redevelopment. The methodology was developed to produce a worst-case analysis of future traffic conditions. Trip generation rates were selected to produce a conservative analysis, and no downward adjustments were made to reflect existing uses of the prototype sites. The analysis also examines the impacts of truck and goods movement and effects on transit, bicycle, and pedestrian facilities.

Finally, the analysis considers revisions in the development review process that may be warranted to replace those functions that currently operate within the SEPA framework.

No Action Alternative

Vehicular Circulation

Employment Levels. The current 1997 employment level of The Boeing Company within the Duwamish study area is approximately 17,000. To estimate potential impacts on the MIC's transportation infrastructure, a conservative assumption was adopted that between 1997 and 2010 the work force at Boeing's Duwamish corridor facilities would increase by approximately 8,000 employees, or 47 percent, over current employment. This growth of 8,000 employees was assumed to include 3,265 new employees at Prototype Site 3, and 4,735 new employees located elsewhere in the MIC. Of the total growth, approximately 60 percent of the new employment (4,800) was assumed to be manufacturing, which affects the 2:30 to 3:30 afternoon peak hour. Forty percent of the new employment (3,200) was assumed to be research and development, affecting the 5:00 to 6:00 evening peak.

Under the No Action alternative, new Boeing employment of 4,735 employees was assumed, with 3,360 in the 2:30 to 3:30 p.m. peak hour and 1,375 employees in the 5:00 to 6:00 p.m. peak. All projections of future baseline traffic volumes are based on these assumptions. Other employment growth under the No Action alternative is assumed to be included in the estimate of growth of background traffic volumes in the corridor.

Street System. The existing street system is currently being improved by widening East Marginal Way South.

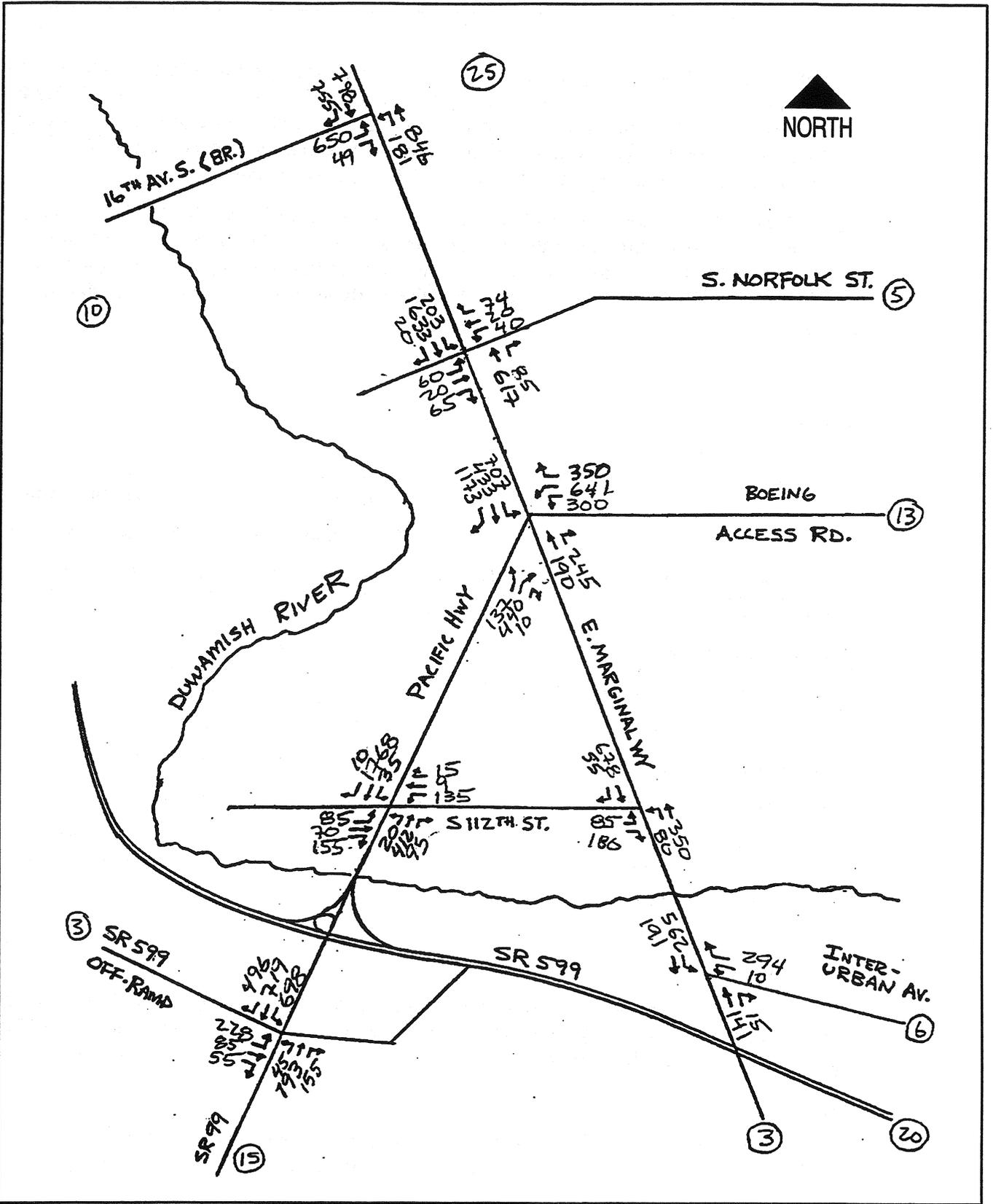
Traffic Volumes. Traffic volumes were developed for 2010 p.m. peak hours by using the growth projections for Boeing and adding them to 0.5 percent annual growth factored existing 1997 traffic volumes. The growth factor accounts for unspecified growth in the corridor and is representative of historic growth on the surrounding state route system. The total 2010 "No Build" traffic volumes represent approximately 1 to 2 percent annual growth in the area.

Trip generation for the No Action alternative was derived from the trip generation rates presented in the Institute of Transportation Engineers (ITE) Manual, Fifth Edition. The trip generation rates for each land use type are summarized in Table 5-2.

TABLE 5-2
Trip Generation Rates

Land Use	Unit	Daily	PM Peak Total	% IN	% OUT
Manufacturing	Employees	3.85	0.39	53	47
Research & Development	Employees	7.7	0.41	15	85

Trip distribution for the No Action alternative was developed from the City of Tukwila travel demand model for the North Duwamish Corridor access options. A select zone analysis was conducted to formulate a regional distribution of Boeing employment. The future No Build distribution and traffic volumes are illustrated in Figures 5-4 & 5-5 for both p.m. peak hours.



LEGEND

xx Traffic Volumes

(xx) Boeing Percent Distribution

Figure 5-5

**2010 No Build Traffic Volumes
5:00 to 6:00 PM Peak Hour**

Level of Service. Estimated LOS at selected roadway segments for the 2010 No Action alternative are shown in Table 5-3. With the newly constructed improvements along East Marginal Way South, the arterial would continue to operate at LOS C or better along segments north of the South Boeing Access Road. South of the South Boeing Access Road, East Marginal Way South would drop to LOS D in the 2:30 to 3:30 p.m. peak.

South Boeing Access Road, Airport Way South, 16th Avenue South, Pacific Highway South, and South Cloverdale Street would change from the current LOS D to LOS E or F. Interstate 5, South Michigan Street, and the First Avenue South bridge would continue to operate at LOS E or F. All other roadways within the study area would remain at LOS D or better.

TABLE 5-3
Estimated No Action LOS for 2010

Study Intersections	1997 Existing				2010 No Action			
	2:30 to 3:30 PM		5:00 to 6:00 PM		2:30 to 3:30 PM		5:00 to 6:00 P	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
E. Marginal Way & 16th Ave. S.	15	C	16	C	24	C	18	C
E. Marginal Way & S. Norfolk St.	12	B	10	B	16	C	11	C
E. Marginal Way & Boeing Access Rd.	23	C	28	D	28	D	30	D
Pacific Hwy. S. & S. 112th St.	>60	F	18	C	>60	F	24	F
Pacific Hwy. S. & S. 116th On Ramp	12	B	11	B	15	B	13	B
E. Marginal Way & Interurban Av. S.	7	B	7	B	7	B	7	B
E. Marginal Way & S. 112th St.*	14	C	25	D	22	D	>45	F

Delay in seconds

* Intersection is unsignalized

Accidents

Additional vehicular and pedestrian traffic may increase the general accident level, but is not expected to significantly alter the overall accident pattern. Improvements to East Marginal Way South and 16th Avenue South would reduce accidents and improve safety.

Parking

With the addition of 4,735 employees, the No Action alternative would require 15,850 parking spaces during the peak parking demand, with a surplus of 2,150 spaces.

Proposed Action

Description of Prototypes

The proposed action is investigated through the examples of the three prototypes, illustrating representative development proposals at three sites in the MIC. Refer back to Figure 2-1 for the location of the three prototype sites; sample site layouts and driveway locations are described in Chapter 2.

The following land uses and square footages are assumed:

TABLE 5-4
Square Footage by Land Use

Uses	Site 1	Site 2	Site 3
Office	35,000 SF	73,000 SF	
Warehouse		58,500 SF	
Manufacturing			750,000 SF
Research&Development	70,000 SF		
Laboratory	70,000 SF		700,000 SF
Parking Required	437 spaces	126 spaces	1,450 spaces
Parking Provided	525 spaces	135 spaces	600 spaces onsite; 900+ offsite

Vehicular Circulation

Street System. The street system would be the same as for the No Action alternative, including widening East Marginal Way South.

Trip Generation. Increased volumes of traffic with the proposed prototypes was determined using the Institute of Transportation Engineers (ITE) publication, Trip Generation 5th Edition, 1991. The trip rates and generation for each alternative are shown in the Tables 5-5 and 5-6.

Except for trips generated for Site 3 manufacturing, all p.m. trips generated will affect the 5:00 to 6:00 peak. The manufacturing trips are part of Boeing redevelopment and affect the 2:30 to 3:30 p.m. peak.

TABLE 5-5
Trip Generation Rates

Land Use	Unit	Daily	PM Peak Total	% IN	% OUT
Office	SF	(1)	(2)	17	83
Warehouse	SF	4.88	0.74	35	65
Manufacturing	SF	3.85	0.75	53	47
Research & Development/Lab	SF	7.7	1.07	15	85

$$(1) \text{Ln}(T) = 0.756 \text{Ln}(x) + 3.756$$

$$(2) \text{Ln}(T) = 0.737 \text{Ln}(x) + 1.831$$

$$T = \text{Trips}, x = 1000\text{sf}$$

TABLE 5-6
Trip Generation

Land Use	Size	Unit	Daily (veh/day)	PM Peak Total	In (veh/hr)	Out (veh/hr)
Site 1						
Office	35,000	SF	630	86	15	71
R&D	70,000	SF	540	75	11	64
LAB	70,000	SF	540	75	11	64
Site 2						
Office	73,000	SF	1,100	147	25	122
Warehouse	58,500	SF	290	43	15	28
Site 3						
Manufacturing	750,000	SF	2,890	565	299	266
Lab	700,000	SF	2,700	750	112	638

Trip Distribution. Trip distribution for the proposed action would follow the same patterns as in the No Action alternative. The trip generation figures were combined with the trip distribution patterns to produce the site trips in each of the p.m. peak hours. Total site trips are presented in Figures 5-6 for the 2:30 to 3:30 peak and Figure 5-7, 5-8 and 5-9 for the 5:00 to 6:00 peak.

Cumulative Traffic Assignment. Each p.m. peak hour site trip generation was combined with the appropriate "No Build" condition to summarize the cumulative 2010 Build condition, as illustrated in Figure 5-10 and 5-11. Typical traffic volume increases over existing volumes range from 2 to 3 percent annually.

Level of Service. Projected LOS along selected roadway segments are presented in Table 5-7. Most roadway segments would remain unchanged as compared to the No Action alternative. East Marginal Way South would continue to operate at an acceptable LOS (LOS D or better) north of South Boeing Access Road. The intersection of Pacific Highway South and South 116th Ave/SR 599 on-ramp would deteriorate from LOS C or better to LOS D. The intersection of Pacific Highway South and South 112th Street would continue to operate at LOS F from 2:30 to 3:30 p.m., but would drop from LOS C to LOS F from 5:00 to 6:00 p.m.

The unsignalized intersection of East Marginal Way and South 112th Street would operate at LOS F in both p.m. peaks. All conditions in Table 5-7 that are bold are defined as unacceptable; improvements at the following intersections will be necessary, unless the city determines that the corridors "average LOS" is at LOS E or better:

- Pacific Highway South and South 112th Street
- East Marginal Way and 112th Street

TABLE 5-7
PM Peak Hour Level of Service Summary

Study Intersections	2010 No Action				2010 Buildout			
	2:30 to 3:30 PM		5:00 to 6:00 PM		2:30 to 3:30 PM		5:00 to 6:00 PM	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
E. Marginal Way & 16th Ave. S.	24	C	18	C	25	C	21	C
E. Marginal Way & S. Norfolk St.	16	C	11	C	18	C	12	B
E. Marginal Way & Boeing Access Rd.	28	D	30	D	32	D	31	D
Pacific Hwy. S. & S. 112th St.	>60	F	24	F	>60	F	>60	F
Pacific Hwy. S. & S. 116th On Ramp	15	B	13	B	20	C	16	16
E. Marginal Way & Interurban Av. S.	7	B	7	B	7	B	8	8
E. Marginal Way & S. 112th St.*	22	D	>45	F	>45	F	>45	F

Delay in Seconds
 Intersection is unsignalized

Parking

Sites 1 and 2 will provide adequate parking in excess of city code requirements. With the redevelopment of Site 3, total Boeing employment will reach 25,000, and the estimated parking demand will be 18,200 spaces. The Existing and No Build parking supply is estimated at 18,000; 2010 conditions thus produce a 200-space shortfall. Site 3 will add 200 spaces to the parking supply to eliminate the short-fall.

Transit

As employment grows in the MIC, additional riders will be attracted to transit. If the mode share of transit remains at about 10 percent of day-shift employees, an increase in employment of 8,000 jobs would generate about 800 additional riders, or 1,600 transit trips daily. These trips would be distributed among the 11 bus routes using E. Marginal Way in this area. Some routes provide excess capacity and could accommodate marginal increases in ridership. On other routes, larger buses or more frequent service may be required.

In the short term, transit ridership is likely to rise gradually in response to employment increases. Implementation of commuter rail service between Seattle and Tacoma could draw riders both from private vehicles and from bus routes. The potential station location is remote from actual employment sites, and employees are unlikely to walk. Shuttle functions between the station and employment sites could be served by revising existing bus routes or adding new shuttle service.

Initially, commuter rail will provide service only in peak commute hours and at intervals of about 30 minutes. Existing bus routes and schedules are expected to be unaffected by the commuter rail service, except as noted above.

In the longer term, with implementation of LRT service, extensive revisions to bus routes and schedules could be expected. Bus routes operating in the LRT corridor may be revised

to feed riders to the LRT stations. Other bus routes serving the MIC could be eliminated or revised extensively.

Because LRT will operate more frequently and over longer hours than commuter rail, MIC employees living near the LRT corridor may find it an attractive commute option. Transit mode split might increase beyond the 10 percent share observed today. In that case, fewer vehicular trips would be generated by uses within the MIC. Given the distance between the shared commuter rail/LRT station and the employment centers, shuttle service is likely to be required.

Goods Movement

Truck Traffic. The increase in employment is expected to generate an increase in truck traffic of approximately 3 percent over the No Action Alternative, assuming truck traffic increases in proportion to the general traffic volume increase.

Rail Transportation. There would be no change from existing conditions.

Air Transportation. There would be no change from existing conditions.

Nonmotorized Transportation. Sidewalks are required for all private and public projects by the zoning code. Each site design would incorporate pedestrian-friendly features such as walkways to transit stops and parking lots. Studies have shown that the maximum distance a transit patron will walk to a transit station is 1,000 feet. Shortest-path pedestrian routes and convenient pedestrian access improve the accessibility and desirability of transit. Pedestrian routes should be direct, clean, safe, adequately lit, and covered, where appropriate.

Bicycle routes are designated along major facilities along the corridor. Sheltered bicycle parking and employee facilities should be provided with the proposed project.

Mitigation Measures

Intersection/Street Improvements

By 2010 it is estimated that the Tukwila MIC will generate 25,000 new daily vehicle trips to the adjacent street network, with approximately 2,100 and 1,900 trips occurring during the 2:30 and 5:00 p.m. peaks. To accommodate the increases in traffic generated from new proposed projects, several mitigation measures are possible to improve traffic operations, safety, capacity, and levels of service at city intersections and access to new developments. These measures are described briefly below.

Pacific Highway South and South 112th Street

In the 2010 cumulative condition, this intersection operates at LOS F in both 2:30 and 5:00 p.m. peaks. The LOS can be improved to LOS D in both peaks by providing a protected/permissive signal phase for east/west traffic. This would include installation of signal head and system wiring.

East Marginal Way and 112th Street

In the 2010 cumulative condition, this unsignalized intersection operates at LOS F in both 2:30 and 5:00 p.m. peaks. The LOS can be improved to LOS B in both peaks with the installation of a traffic signal and intersection channelization.

Access Management

Management of access along arterial routes provides a mechanism for protecting the capacity of the route and creating orderly access to adjacent properties. A formal program of access management minimizes disruption to through traffic by eliminating unnecessary driveways, creating shared driveways, adopting driveway spacing standards, prohibiting turns or closing the median, and restricting signal locations. These and other related measures can mitigate adverse impacts associated with increasing traffic volumes.

Currently, permits are required for curb cuts onto city streets. Driveway spacing standards in the zoning code require only that the curb cut be at least 20 feet from the nearest intersection. Other driveway design criteria are applied by the City Engineer in assessing curb cut locations, using engineering judgment to avoid offset opposing driveways, which can create queuing conflicts in center, left-turn lanes.

Along East Marginal Way north of Boeing Access Road, development patterns are established, and many access locations are signalized. Additional signals are not desirable because closer signal spacing would impair traffic operations.

Boeing Access Road is provided with full access control, so no opportunity exists to develop local access.

Along Pacific Highway South, the focus of local access will be the signalized intersection of 112th Street. Future driveways may be developed, but turning movements may need to be restricted.

On East Marginal Way to the south, local access can be permitted by using a center, two-way, left-turn lane. This widening would allow through traffic to flow without interruption by left turns into driveways.

Transportation Demand Management

Transportation demand management (TDM) comprises a set of techniques that reduces demand for travel in single-occupant vehicles (SOVs). These measures include rideshare matching, preferential carpool parking, vanpool formation, and transit incentives such as transit pass subsidies. Such programs can contribute to reduced congestion, less energy consumption, and improved air quality.

The statewide commute trip reduction requirements for large employers to implement TDM programs have been somewhat effective in reducing SOV travel. The original targets have been rescinded, and parts of the program are voluntary. Boeing operates a transportation management plan to encourage alternative commute modes.

Commute activity also can be managed through assignments of workers to shifts, and by flextime or alternative work schedules. These measures alter commute times without affecting overall demand.

TDM measures are typically most effective when applied in large employment centers where opportunities for ridesharing are available, and transit service is a viable alternative. Employers benefit by devoting less total area to parking.

Processes Under Proposed Action

The planned action process will change the development review procedures for projects within the MIC. Development applications that conform to the subarea plan will not be analyzed through additional SEPA review. In this section, the permitting needs of this revised process are examined as they relate to transportation impact mitigation.

Thresholds

The City's concurrency ordinance presently specifies that projects generating five or more peak-hour vehicle trips are subject to fair-share, impact mitigation fees. Most projects anticipated in the MIC would surpass this threshold and would, therefore, be eligible for payment of fees. However, a fee program is not currently in place for the MIC. The mitigation analysis for the study area reveals two intersection projects that will be needed in the future to support growth in the MIC. A fee schedule could be developed for the MIC district based on the costs of the improvements and the tripmaking characteristics of new development projects.

Alternatively, a discretionary review could be required for proposals that increase congestion at the two intersections (S. 112th Street at East Marginal Way S., and S. 112th Street at Pacific Highway S.) by more than a specified additional delay. The proposed action includes a recommendation that projects that would increase the estimated delay at the two intersections by more than 30 seconds during the afternoon peak hour undergo SEPA review of impacts and mitigation. For projects that would increase the estimated delay by between 15 and 30 seconds at either of the two intersections, the proposed action's recommendation is that SEPA review of impacts and mitigation be required at the discretion of the city's SEPA official. SEPA review will allow the city to require mitigation.

Guidelines for Site-Specific Studies

Under the MIC implementation plan, the traffic analyses traditionally undertaken through SEPA would no longer be required for projects conforming to the MIC subarea plan. The systemwide aspects of future traffic growth are addressed in this EIS; however, site-specific layouts and design details for future development proposals are currently unknown. For this reason, future projects in the MIC should include preparation of a traffic study of limited scope to consider site-specific design details.

The traffic study requirement should be formalized through the City's concurrency ordinance. Development projects in the MIC would have a requirement to prepare these studies at the time of application. Topics that should be included in the traffic study are outlined below:

- Submit site plan showing building area, access points, and parking layout.
- Obtain or conduct traffic count at the closest arterial intersection(s).

- Estimate trip generation, trip distribution, and traffic assignment for the year of opening.
- Prepare intersection capacity analysis for the opening year at study intersections and at proposed driveway locations.
- Determine site access and frontage improvement needs.

City staff would review the site-specific traffic studies to assess the adequacy of the access plan and its conformance with design standards. Issues related to sight distance and safety also could be addressed through this mechanism.

Driveway Standards

Some communities have developed standards regulating the location and spacing of driveways. Typically, these standards address the number of driveways, their distances from adjacent intersections, driveway width, spacing between adjacent driveways, and alignment with driveways across the street. The current zoning code and design standards address several of these issues. Additional standards are recommended for incorporation into the design standards, as indicated in Figure 5-12.

Frontage Improvements

Improvements along the site frontage are regulated by the design standards and sidewalk ordinance. These improvements can be identified through the site-specific traffic study. No other revisions are proposed.

Assessment of Concurrency

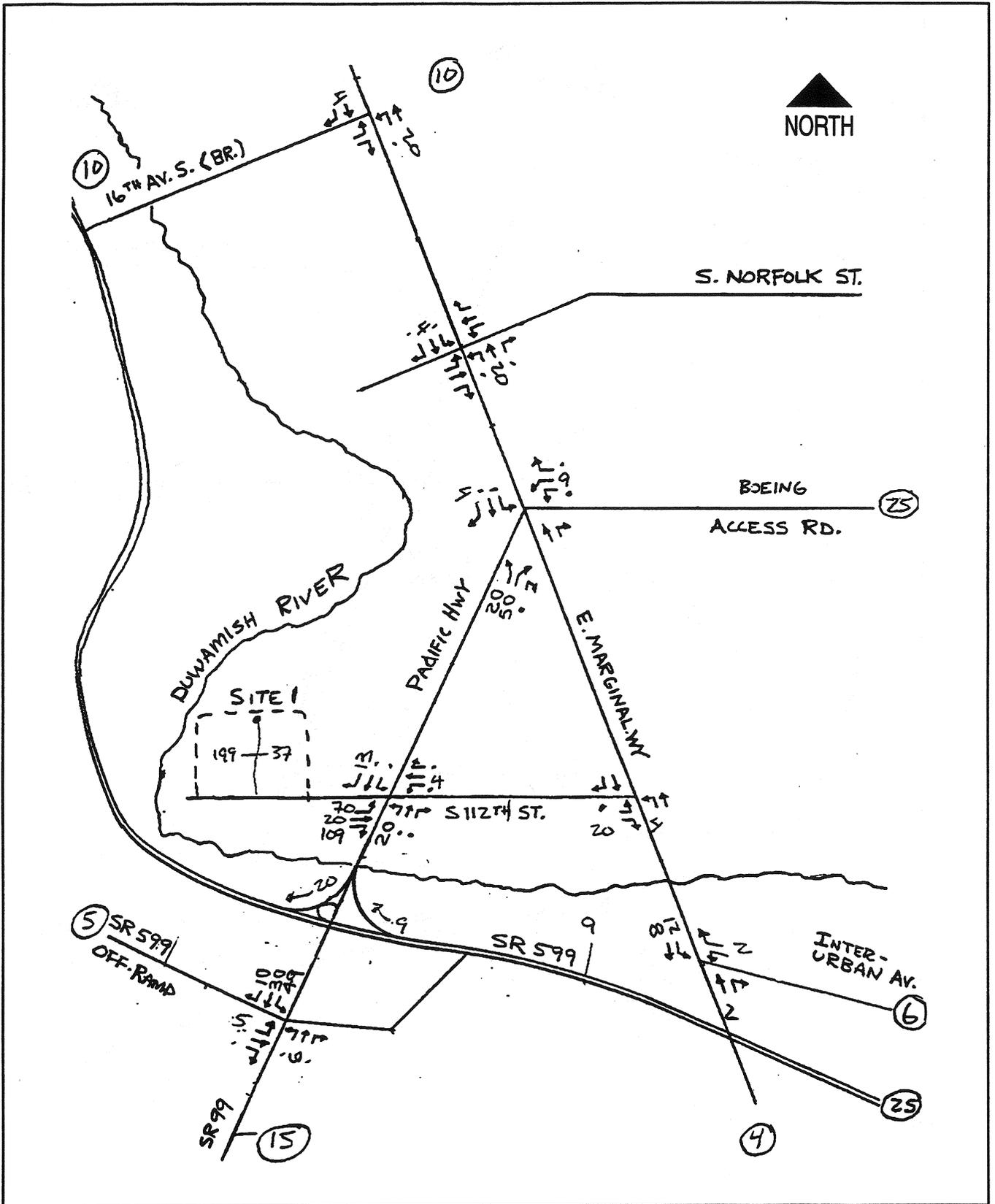
The level of development proposed for the MIC for 2010 can be accommodated by the street system, with the mitigation measures noted. Levels of service on the arterial and collector streets will comply with the applicable LOS standards. The City has adopted a mitigation payment system that can be expanded to recoup fair share contributions related to project impacts.

Through the mechanism of the site-specific traffic study, any potential deterioration of intersection LOS can be identified at the permit application stage. The existing concurrency ordinance provides for actions to protect LOS, including expansion of street capacity through a latecomer's agreement, application of TDM measures, or deferral of the project.

Unavoidable Adverse Impacts

- Traffic volumes will increase.
- Total accidents may increase.
- Transit ridership increases may require additional transit service.

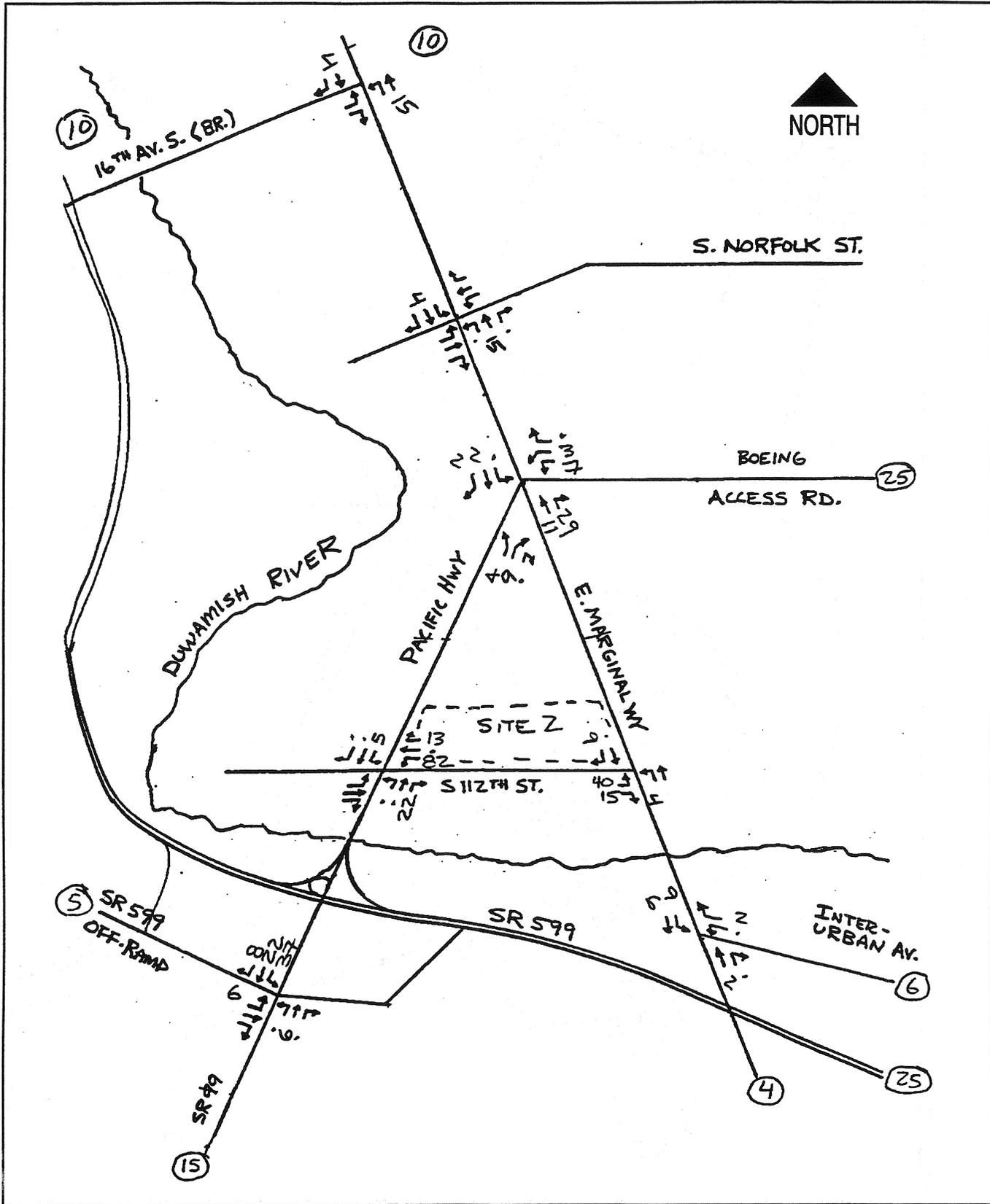
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LEGEND
 xx Project Trips
 (xx) Project Distribution

Figure 5-7
Site 1 Project Traffic
5:00 to 6:00 PM Peak Hour

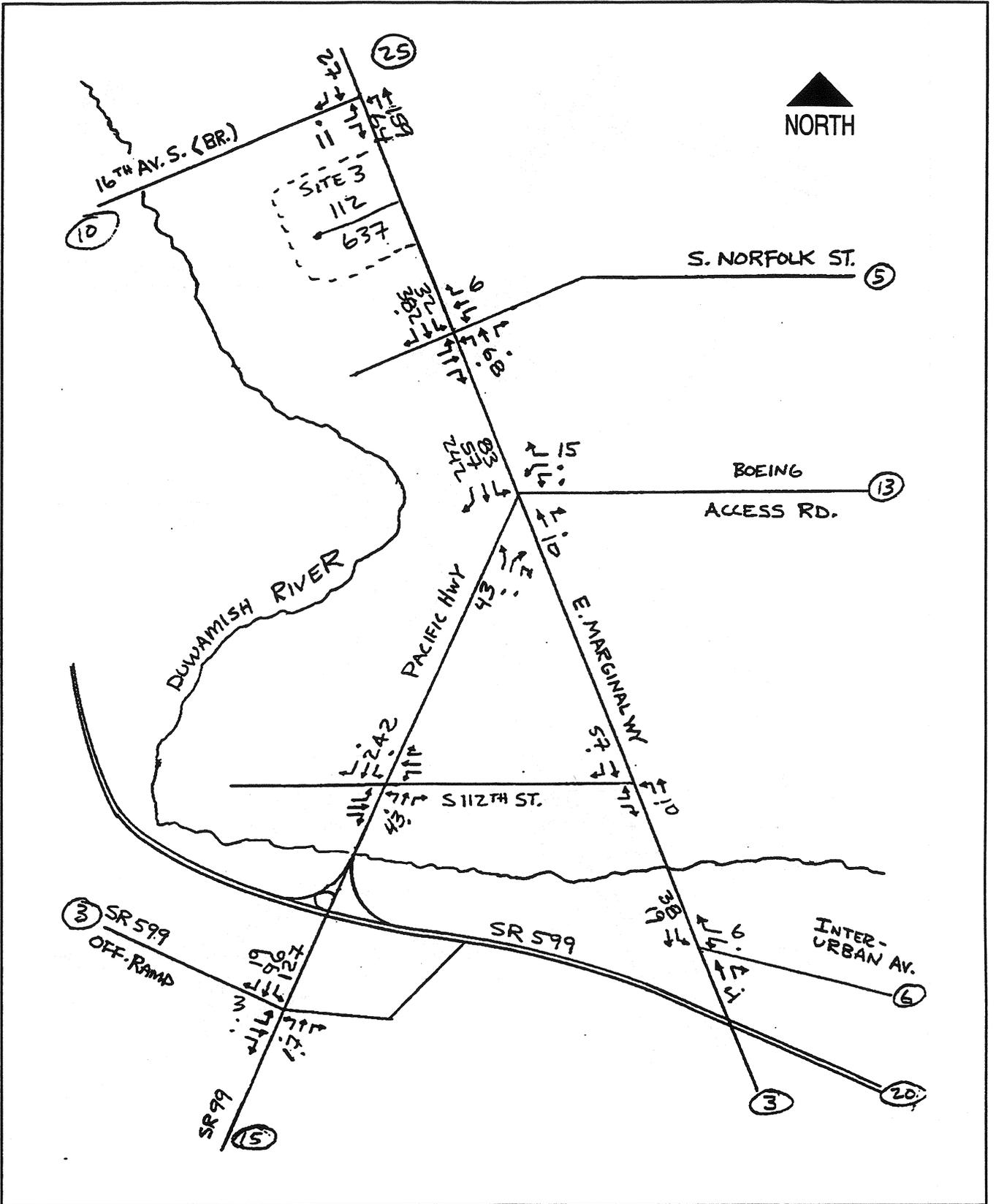
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LEGEND

- xx Project Trips
- (xx) Project Distribution

Figure 5-8
Site 2 Project Traffic
5:00 to 6:00 PM Peak Hour



LEGEND

- xx Project Trips
- (xx) Project Distribution

Figure 5-9
Site 3 Project Traffic
5:00 to 6:00 PM Peak Hour

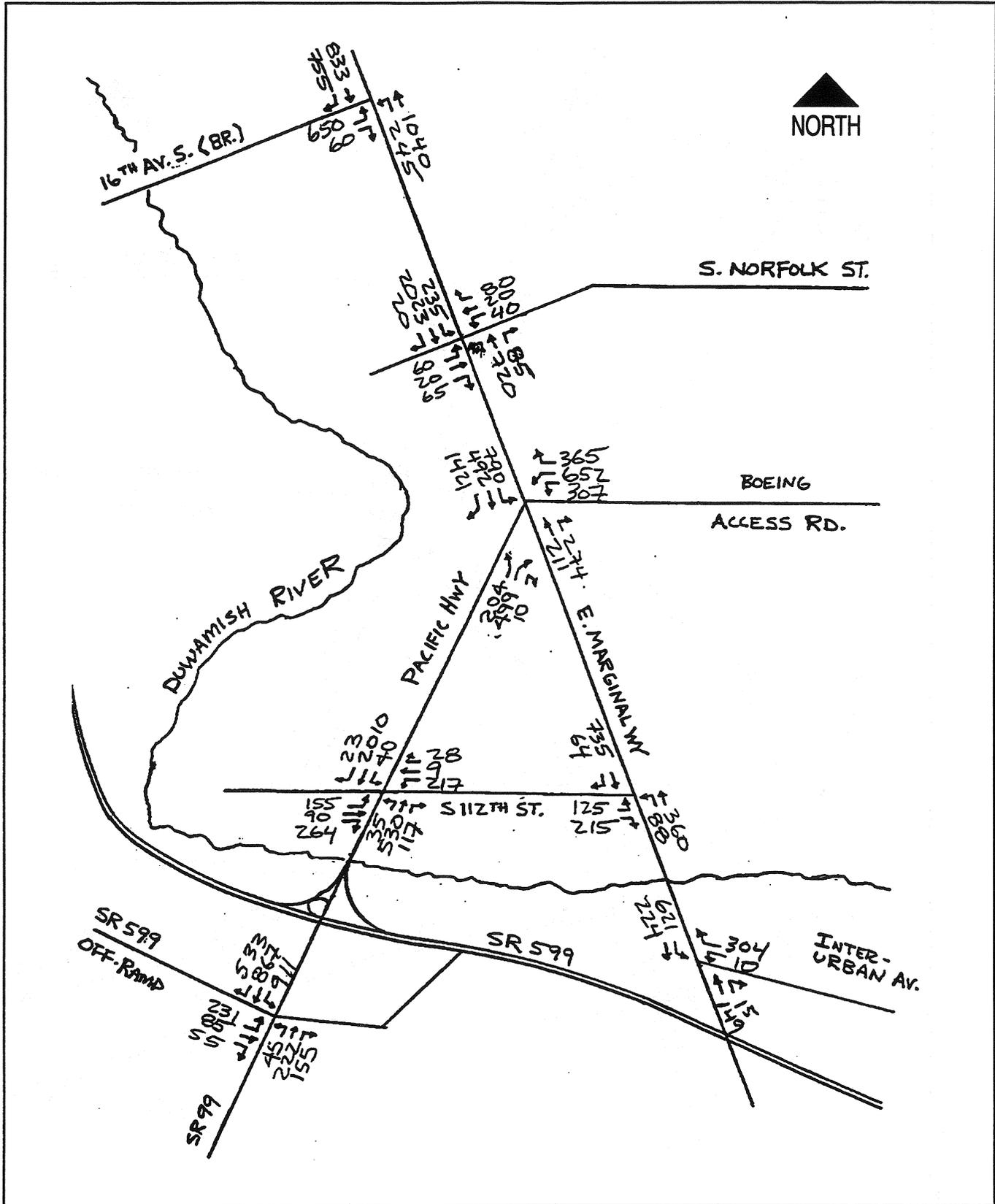


Figure 5-10
 2010 Total Traffic Volume
 2:30 to 3:30 PM Peak Hour

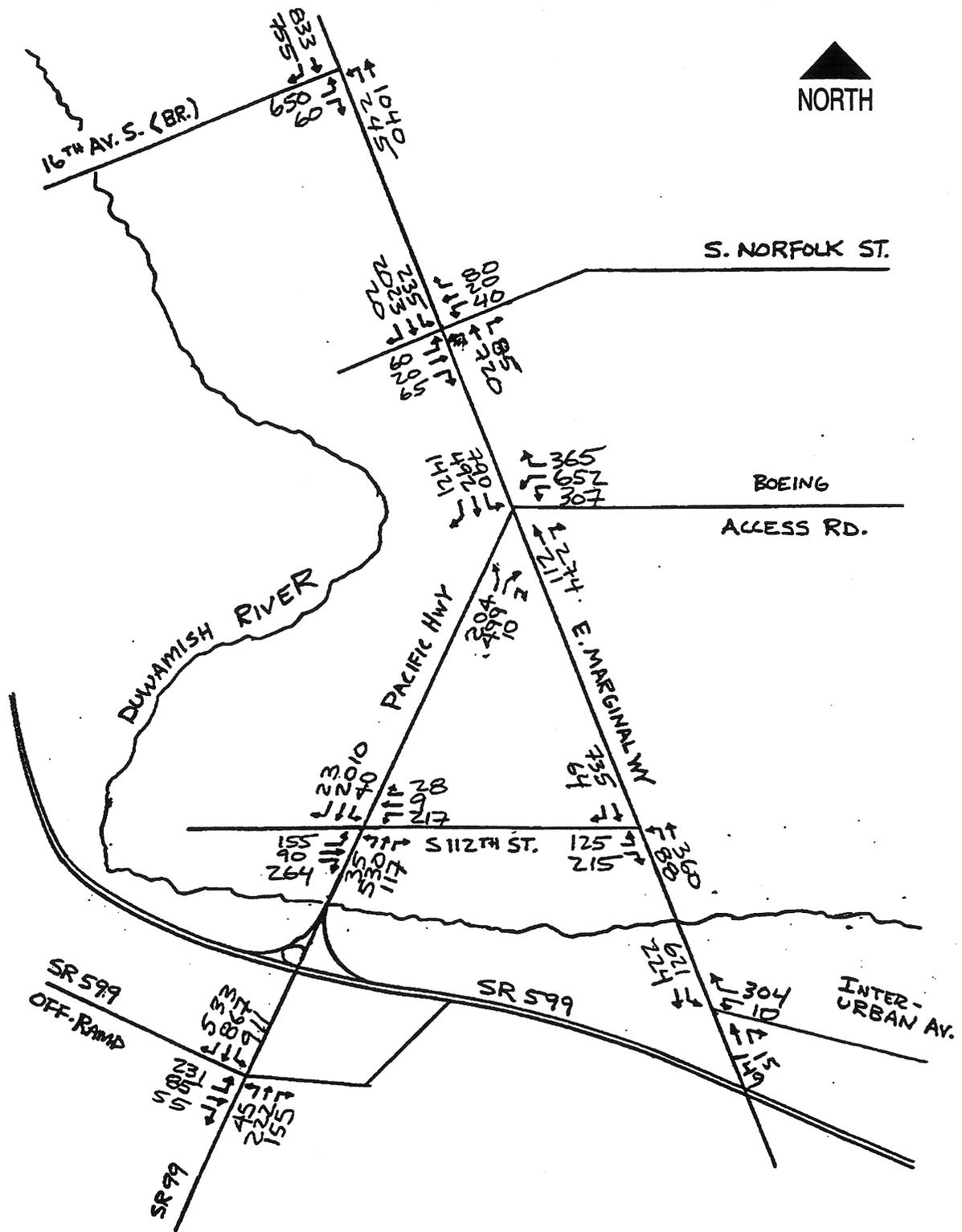
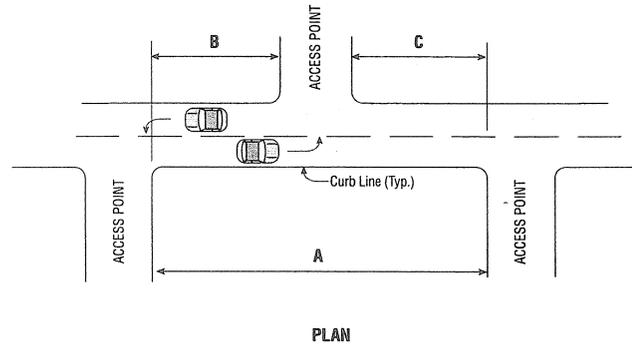


Figure 5-11
**2010 Total Traffic Volume
 5:00 to 6:00 PM Peak Hour**

MINIMUM ACCESS POINT SPACING – COMMERCIAL/INDUSTRIAL (Feet) ①⑥

ROADWAY SPEED (mph) ②	DIMENSION A		DIMENSION B ③		DIMENSION C ⑤	
	ARTERIALS ③	NON-ARTERIALS ④	ARTERIALS	NON-ARTERIALS	ARTERIALS	NON-ARTERIALS
25	105	35	105	75	105	35
30	125	40	125	75	125	40
35	150	45	150	75	150	45
40	185	50	185	75	185	50
45	230	50	230	75	230	50



PLAN

NOTES:

1. Access point spacing only. For public street spacing, see text section 6-06.
2. Refers to posted speed or operating speed, whichever is greatest.
3. Between the nearest edges of two-way access points. Distances between adjacent, one-way access points (with the inbound access upstream) can be one-half the distances shown above.
4. Between the nearest edges of one or two-way access points.
5. Access points directly opposite from each other are most desirable. Where this is not possible, these dimensions will apply.
6. Where access points are to be signalized, a minimum spacing of 1200 feet to any other signalized intersection should be maintained. If the signalized access points form a "T" intersection with little possibility of any future access point across the street, a minimum spacing of 600 feet from the nearest signalized intersection may be acceptable.
7. In cases where access point spacing is not attainable because existing frontages are narrow, access points should be located as close to the tabulated values shown above as possible. When this occurs, the engineer may require investigations to substantiate whether or not left turns should be prohibited into or out of the access point.

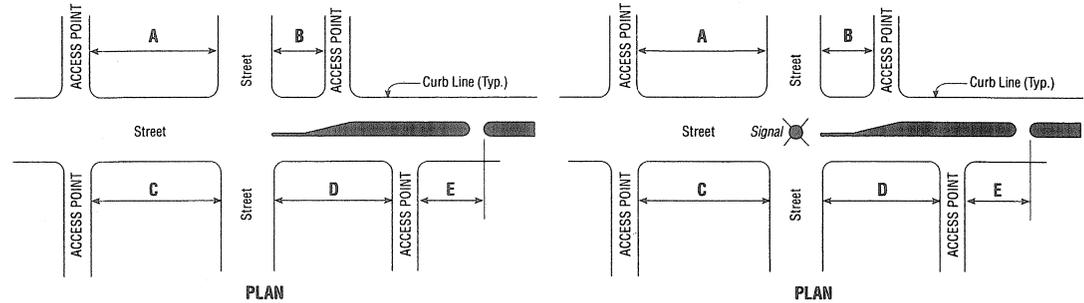
Commercial/Industrial Access Point Spacing

MINIMUM CORNER CLEARANCES FOR STOP SIGN INTERSECTION CONTROL (Feet)

DIM.	ARTERIALS				NON-ARTERIALS
	Arterial Operating Speed				
	30	35	40	45	
A	115	135	150	180	50
B	85	105	120	140	50
C	115	135	160	180	50
D	115	135	160	180	50
E	115 or 0	135 or 0	160 or 0	180 or 0	0

MINIMUM CORNER CLEARANCES FOR SIGNALIZED INTERSECTION CONTROL (Feet)

DIM.	ARTERIALS				NON-ARTERIALS
	Arterial Operating Speed				
	30	35	40	45	
A	230	275	320	365	50
B	115	135	160	180	50
C	230	275	320	365	50
D	230	275	320	365	50
E	115 or 0	135 or 0	160 or 0	180 or 0	0



PLAN

PLAN

NOTES:

1. In cases where corner clearances are not attainable because frontages are narrow, access points should be located as close as practicable to the property line most distant from the intersection. At such locations, the engineer may require investigations to substantiate whether left turns should be prohibited into or out of the access point.
2. Access points near stop or signal controlled intersections should be checked to determine whether stopping queues will block the access point.

Commercial/Industrial Corner Clearances

Figure 5-12
Commercial/Industrial Access Point Spacing
Commercial/Industrial Corner Clearances

Other Elements of the Environment

Introduction

This chapter addresses the set of codes and other regulatory controls that apply to development proposals in the MIC as they relate to sewer, water supply, energy, environmental health (air, noise, and hazardous waste), and surface water. Because each of the prototype sites is currently supplied with urban services and utilities, the analysis in this chapter does not generally address issues raised by the individual prototypes, but rather provides a corridor-wide discussion.

The No Action alternative would result in continued application of existing codes and regulations to development proposals in the MIC. Since the issues addressed in this chapter are generally covered adequately by current codes and regulations, the impacts of the No Action alternative are similar to those of the proposed action for these issues.

Sewer System

Existing Conditions

Sanitary sewer service is provided to the MIC by the City of Tukwila and the Val-Vue Sewer District, which serves a southern portion of the area (see Figure 6-1). On the east side of the Duwamish River, wastewater is collected from individual side sewers via city or district mains or through direct connections to King County's 42-inch main located in East Marginal Way South. Most of the commercial/industrial customers along East Marginal Way South connect directly to King County's main. Sewer connections in the Val-Vue Sewer District are served by a network of 8-inch lines that connect to King County's 42-inch main via a pump station and pipeline across the Duwamish River.

Neither the city nor the Val-Vue Sewer District provide wastewater treatment; King County provides this function. Wastewater from Tukwila is conveyed to the County's Renton Treatment Plant.

The City of Tukwila completed a comprehensive sewer system plan in 1991 (Horton Dennis and Associates, 1991) that identifies a range of wastewater facility and collection needs throughout the city. When this plan was completed, most of the MIC had been only recently annexed to the city; as a result, there is little discussion in the plan about system conditions and deficiencies in the MIC area. However, Supplement A to this plan identifies annexation areas, including the MIC, and service area improvements that would be required to serve these areas. Since adoption of this plan, the city has completed an inflow and infiltration (I/I) reduction project that included cleaning and grouting of some pipes in the MIC and has monitored discharge from the Boeing sewer system (Brodin, personal communication, 1997). Sewer facilities are expected to provide adequate capacity to the MIC to support development and redevelopment consistent with the city's Comprehensive Plan.

Consistent with RCW 56, the Val-Vue Sewer District is updating its Sewer Comprehensive Plan, consistent with both state and county requirements. This plan will identify existing system conditions, recommend new facilities required to serve future development in the district, and address coordination with Rainier Vista Sewer District facilities, which recently merged with the Val-Vue District. The district also recently installed sewers in the Riverton area, bounded on the north and east by the Duwamish River and on the south and west by Interurban Avenue South. The district works closely with the City of Tukwila to ensure that sewer capacity and infrastructure is available for development that is projected in the city's Comprehensive Plan. In addition, the city has required the district to enter into a franchise agreement with the city consistent with RCW 34A.87.040, to provide sewer service within the city limits.

Existing Plans and Regulations

The city has adopted several regulations to ensure adequate sewer capacity is available for proposed development or redevelopment and that applicants pay their fair share for system improvements before development occurs.

The city requires a Sewer Main Extension Permit to extend a sewer main to serve a proposed development. In general, the applicant is required to extend sewer to the extreme boundary of the property (Ordinance 1770). The city also requires a Sanitary Side Sewer Permit for connecting or reconnecting a building to a public or private sewer main. Specifications for sewer improvements are provided in the city's Infrastructure Design and Construction Manual.

The City of Tukwila adopted Ordinance 1769 to implement the concurrency requirements of the Growth Management Act (RCW 36.70A), which require that cities and counties develop procedures to determine whether adequate utilities are available to serve proposed new development and to specify mitigating conditions if utilities are not adequate. This ordinance requires applicants to obtain a certificate of sewer availability from either the purveyor serving the area, if the site is served by a purveyor other than the City of Tukwila, or from the City Department of Public Works. Upon approval from the purveyor or the city, the applicant receives a certificate or approval verifying that adequate sewer capacity will be available to serve the proposed development at the time of occupancy. If utilities are inadequate, the city requires applicants to provide mitigation payments equal to their fair share for sewer system improvements.

King County also has a sewer surcharge program for discharge of high-strength industrial wastewater. High strength waste is defined as sewage stronger than domestic waste that contains more than 300 mg/l of biochemical oxygen demand (BOD) and 400 mg/l of suspended solids.

The city's Building Code (TMC 16.04.150) requires that side sewers be plugged and capped at the property line if a building on a property is demolished, or capped at the main if the connection will not be reestablished.

Impacts

No impacts to sanitary sewer service are anticipated in the buildout of the MIC. Both the city and Val-Vue Sewer District have completed improvements to the MIC's sewer infrastructure to accommodate development and redevelopment consistent with the city's

Comprehensive Plan. In addition, most of the MIC area has been developed, and it is anticipated that adequate sewer infrastructure is already in place on most of these sites.

Application of existing City of Tukwila codes, ordinances, and policies to the prototypes demonstrates that the applicant would be required to demonstrate adequacy of sewer facilities to serve the proposed development using the procedures spelled out in Ordinance 1769. If site investigations indicate that facilities are not adequate to serve the proposed level of development, the city would require mitigation payments to perform the necessary improvements.

Mitigation Measures

None identified.

Unavoidable Adverse Impacts

None anticipated.

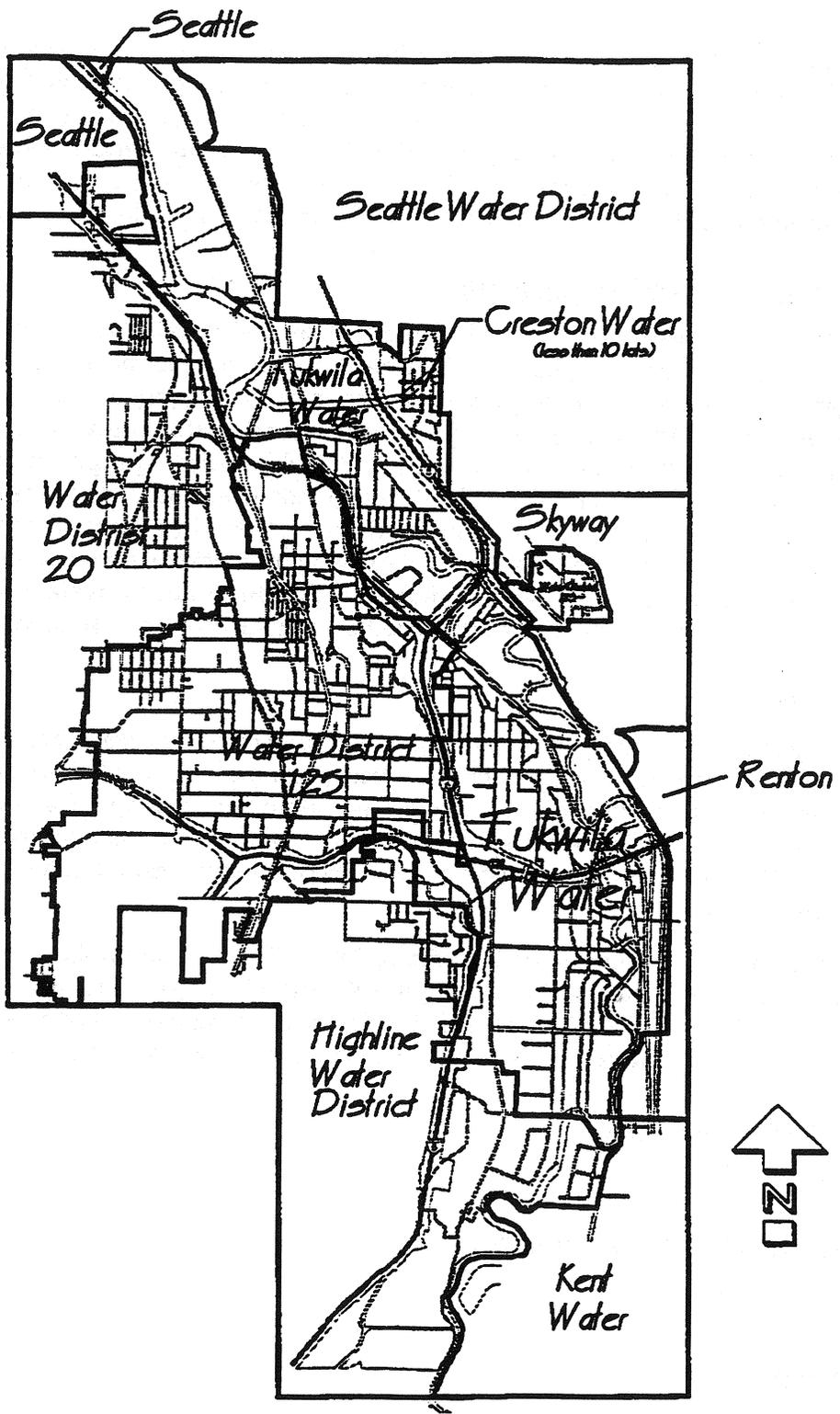
Water Supply

Existing Conditions

The City of Tukwila provides water to most of the MIC. Exceptions include a portion of the "oxbow" area and areas west of the Duwamish River. Refer to Figure 6-2 for an illustration of the boundaries of nearby water districts. Tukwila purchases water from the City of Seattle and taps into Seattle's water conveyance system in six separate locations throughout the city. Tukwila is under a long-term contract with Seattle to purchase all of its water from Seattle through 2012. Service to the MIC east of the Duwamish River is provided by an 18-inch ductile iron water main, recently installed by the city, along East Marginal Way South, and by a 12-inch branch of this main along Pacific Highway South. The new 18-inch main was constructed to meet identified fire flow and maintenance deficiencies. Water is provided to the portion of the MIC located on the west side of the Duwamish River by the City of Seattle via a 20-inch ductile iron pipe in West Marginal Place.

An abandoned 21-inch water line in the East Marginal Way right-of-way is available, enabling employing reused water in the MIC for irrigation or heat exchange. This could be accomplished by tapping the effluent line (known as the Effluent Transfer System [ETS] line) on the west side of the river for treated effluent from the Renton Treatment Plant. The plant is operated by King County. Reuse of treated wastewater effluent helps extend the region's potable water supply. Boeing is using treated wastewater effluent at its Longacres facility.

The City of Tukwila completed a Comprehensive Water System Plan in 1991 (Horton Dennis and Associates, 1991) that identifies a range of water supply and distribution needs throughout the city. When this plan was completed, most of the MIC had been only recently annexed to the city; as a result, there is little discussion about system conditions and deficiencies that applied to the MIC area. However, Supplement A to this plan identifies annexation areas, including the MIC, and service area improvements that would be required to serve these areas. Since adoption of this plan, the city has addressed storage deficiencies in the MIC by linking northern parts of the city to an existing 18-inch main in the Allentown



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Figure 6-2
Tukwila Water Districts

area of the city. This linkage allows northern portions of the city to benefit from storage provided by the 2-million-gallon North Hill reservoir (Brodin, personal communication, 1997). Additional storage and fireflow capacity are available through a two-way emergency intertie with Seattle at the north end of the MIC. As a result of these improvements, the city has determined that there is currently adequate water system capacity to serve projected development and redevelopment of the MIC consistent with the city's Comprehensive Plan.

Existing Plans and Regulations

Similar to sewer capacity, the city has adopted several regulations to ensure an adequate water supply to serve proposed development or redevelopment. The City of Tukwila adopted Ordinance 1769 to implement the concurrency requirements of the Growth Management Act (RCW 36.70A). The requirements mandate that cities and counties adopt procedures to verify that adequate utilities are available to serve proposed development and implement mitigating conditions if utilities are not adequate. Tukwila requires applicants to obtain a verification of water availability from the City Department of Public Works. If utilities are inadequate, applicants must provide mitigation payments to the city equal to their fair share to address system deficiencies. Specifications for water system improvements are provided in the city's Infrastructure Design and Construction Manual.

Impacts

No impacts to water service are anticipated during the development and redevelopment of the MIC. As is the case with sewer infrastructure, much of the MIC has been developed, and all previously developed sites are adequately served by existing infrastructure. Where larger system-wide deficiencies have been identified, the City has completed improvements to the MIC's water supply infrastructure to accommodate projected development and redevelopment of the area.

Application of existing City of Tukwila codes, ordinances, and policies to the proposed three prototypes indicates that the applicant would be required to demonstrate adequacy of water facilities to serve the proposed development using the procedures spelled out in Ordinance 1769. If facilities are not adequate, the city would require mitigation payments.

Mitigation Measures

None identified.

Unavoidable Adverse Impacts

None anticipated.

Energy

Existing Conditions

Seattle City Light supplies electricity to the MIC from Seattle-owned generating facilities, power supply contracts with BPA, and utilities located in the mid-Columbia basin (City of Tukwila, 1992). Industrial customers in the Duwamish Corridor consume an estimated 1,500,000 MW of electricity annually. State law requires that energy utilities serve all

customers requesting service. Seattle City Light coordinates with the City of Tukwila to phase in infrastructure improvements as needed as growth occurs. Plans for future distribution include additional feeder and substation capacity that will meet demand in the area through 2020. City Light intends to meet the actual growth in electrical loads through conservation acquisition (City of Tukwila, 1995).

Puget Sound Energy (formerly Puget Sound Power & Light and Washington Natural Gas) provides natural gas to the MIC through purchases from producers in Canada and the southwestern Rocky Mountain states. Gas is transported to the MIC area through mains operated by the Northwest Pipeline Company. Puget Sound Energy distributes natural gas from these mains to customers in the MIC area.

Existing Plans and Regulations

Because energy providers are required by state law to provide adequate levels of service, the city has not adopted concurrency requirements or other regulations pertaining to energy supply. The city has, however, adopted the State Energy Code for all new construction (Chapter 51.11 WAC; TMC 16.04.210). The city coordinates closely with energy providers to ensure that energy supply and infrastructure are adequate to serve development in the city as projected by the Comprehensive Plan (City of Tukwila, 1995).

Impacts

None identified. The City of Tukwila closely coordinates with energy providers to ensure that adequate capacity exists to serve growth throughout the city, including the MIC, as projected in the city's Comprehensive Plan. Adequate energy supply would be available to serve all three prototype sites. All new construction would be required to comply with the Washington State Energy Code.

Mitigation Measures

None identified.

Unavoidable Adverse Impacts

None anticipated.

Environmental Health (Air, Noise, and Hazardous Waste)

Air

Existing Conditions

The major sources of pollution in the MIC area are automobiles. Carbon monoxide (CO) is the pollutant of greatest concern in the area. Other pollutants of concern include particulate matter (PM₁₀); hydrocarbons and nitrogen oxides, both ozone precursors; sulfur oxides; and nitrogen dioxide. Manufacturing operations also may produce large amounts of volatile organic compounds (VOCs) from activities such as painting.

The MIC has been included in a non-attainment area for PM₁₀ since November 1990. The region is now in compliance with all other regional air quality standards.

A variety of pollutants are monitored at the Duwamish station, located at 4752 East Marginal Way South approximately 1 mile north of the MIC. Other air quality parameters are discussed below in qualitative terms and by inference from other monitoring station data.

Particulate Matter. In addition to being in a PM_{10} nonattainment area, the project area is within a previously designated nonattainment area for total suspended particulates (TSP). Typical sources of PM_{10} and TSP are slash burning, wood burning (both wood stoves and fireplaces), industrial sources, auto and truck traffic, and construction activities. The primary sources in the study area are industrial.

Ozone. Ozone is the principal oxidant found in photochemical smog. It is formed through a complex series of chemical reactions involving volatile organic compounds (VOCs), oxides of nitrogen, and sunlight. VOCs and oxides of nitrogen (NO_x) are emitted by both industrial and area sources. Oxides of nitrogen are produced almost exclusively by fuel combustion; VOC emissions are produced both by combustion and by a variety of fugitive emission sources. Since ozone formation requires time for chemical reactions to be completed, ozone reaches its peak concentration several miles downwind from the source of its precursor components. Sources of both ozone precursors (VOCs and NO_x) are found within the MIC. Currently the Puget Sound region is classified as attaining ambient air quality standards for ozone.

Carbon Monoxide. CO is a highly localized pollutant. Collectively, motor vehicles emit more CO than any other source. The project area is currently in attainment for CO standards; the 1992 EIS on Boeing Company redevelopment in the corridor indicated that, even with 25,000 Boeing employees in the MIC, air quality standards for CO would not be violated.

Sulfur Dioxide. Sulfur dioxide (SO_2) is produced mainly by the combustion of fuels containing sulfur, such as oil and coal. Since the Duwamish corridor is a significant industrial area, ambient monitoring data are collected locally (at 4752 East Marginal Way South) to quantify the impacts in this area. The study area is classified as an attainment area for SO_2 ambient air quality standards.

Nitrogen Dioxide. Nitrogen dioxide is produced through combustion processes followed by further atmospheric reactions. Oxides of nitrogen (NO and NO_2 , also referred to as NO_x) are produced in high-temperature combustion conditions with excess air. Further reactions in the atmosphere convert NO to NO_2 . While only NO_2 has known adverse health effects, NO_x emissions also contribute to the reactions that form ozone. NO_x is controlled as a point source pollutant (e.g., from vents and stacks), but no ambient monitoring data are collected for NO_2 in this region.

Existing Plans and Regulations

Air quality standards are established at the national level by EPA, at the state level by Ecology, and at the regional level by PSAPCA. Air quality standards established by Ecology and PSAPCA are essentially the same; PSAPCA standards prevail where differences arise.

All point sources of air pollution in the MIC requiring air quality permits must be registered with PSAPCA. If registration is required, PSAPCA typically requires best available control technology (BACT) for new sources and evaluates each source's specific air quality impacts.

PSAPCA requires BACT on a case-by-case basis after consideration of available technology, environmental and energy impacts, and the cost of complying with emission limitations.

PSAPCA also requires that reasonable precautions be taken to avoid dust emissions during construction (PSAPCA Regulation 9.15). Such precautions may include spraying water or chemical dust suppressants on bare soils during dry, windy weather.

Impacts

Regulatory control of air quality in the MIC is largely the responsibility of Ecology and PSAPCA. Any new point source of pollution would require PSAPCA review and approval. Identified regional air quality problems, such as automobile emissions, typically are addressed on a more regional level and are not expected to impose any specific requirements on activities or uses in the MIC in general, or on development of any of the three prototype sites.

Construction activities at any of the three prototype sites could have a temporary local impact on air quality through the generation of dust. PSAPCA Regulation 9.15 requires implementation of mitigation measures to minimize air resource impacts from construction.

Compliance with PSAPCA requirements is specified in the performance standards of the MIC/L zone in the zoning code (TMC 18.36). A similar citation in the performance standards for the MIC/H zone is not included in the zoning code. Although compliance with PSAPCA's requirements is required independent of the zoning code, it is recommended that a similar reference to compliance with PSAPCA requirements be added to TMC 18.38, the MIC/H zone, for clarification.

Mitigation Measures

Amend TMC 18.38 to specify compliance with PSAPCA requirements. Amend TMC 16.54 to specify compliance with PSAPCA Regulation 9.15.

Unavoidable Adverse Impacts

Since projects under the MIC implementation plan will be in compliance with PSAPCA requirements and other applicable standards, no unavoidable adverse impacts are anticipated.

Noise

Existing Conditions

Human response to noise is subjective and can vary greatly from person to person. Factors that influence individual responses include the intensity, frequency, time, and pattern of the noise; the amount of background noise present before an intruding noise; and the nature of the work or activity that the noise affects.

Environmental noise is measured in units called A-weighted decibels (dBA). The A-weighted decibel scale was developed to approximate the sensitivity of the human ear to different frequencies by deemphasizing frequencies to which the ear is less sensitive. The scale is logarithmic; each 10-dBA increase is perceived by a listener as a doubling of loudness. For example, 80 dBA is judged by a typical listener to be about twice as loud as 70 dBA and four times as loud as 60 dBA. The smallest change in noise level that humans

can hear is about 2 to 3 decibels; increases in average or cumulative noise levels of 5 dBA or more are noticeable under ordinary conditions.

Normal conversation ranges between 55 and 65 dBA when the speakers are 3 to 6 feet apart. Quiet urban nighttime noise levels range in the low 40s dBA; noise levels during the day in a noisy urban area are frequently as high as 80 dBA. Noise levels above 110 dBA become intolerable and can result in hearing loss.

There are several sources of noise in the MIC; they are generally associated with commercial, industrial, and airport-related activities. The principal sources of noise include truck and automobile traffic on Interstate 5 and arterial roads, passenger and freight train operations, and air traffic to and from Boeing Field/King County International Airport and Seattle-Tacoma International Airport. All of the various manufacturing and industrial activities in the MIC collectively contribute to relatively high ambient noise levels.

Existing Plans and Regulations

The Tukwila Municipal Code (TMC 8.22.040) establishes limits on the level and duration of noise crossing property boundaries. Allowable maximum noise levels depend on the land use of the noise source and of the receiving property. Generally, the highest levels of noise are permitted in industrial areas. Maximum permissible daytime noise levels are provided in Table 6-1.

The maximum noise levels allowed in residential areas provided in Table 6-1 are reduced between 10 p.m. and 7 a.m. on weekdays and between 10 p.m. and 9 a.m. on weekends. Increases in permissible noise levels are allowed for short-duration noises. Daytime construction activities are generally exempt from city noise regulations.

TABLE 6-1
City of Tukwila Maximum Permissible Daytime Sound Levels, dBA

Sound Source	Receptor Land Use		
	Residential	Commercial	Industrial
Residential	55	57	60
Commercial	57	60	65
Industrial	60	65	70

Source: Tukwila Municipal Code Sec. 8.22.040

Impacts

City of Tukwila noise standards require construction noise to be limited to the "daytime hours." Within this time period, there are no restrictions on the magnitude of noise generated, as construction noise is typically considered a temporary impact and, as a result, generally not considered significant. There could be temporary noise impacts where construction activities occurred next to sensitive receptors, including schools, hospitals, senior homes, or public facilities. Construction noise regulations would apply at all three prototype sites.

Operational noise would likely increase in the vicinity of Site 1 as this prototype would entail development of a partially vacant lot. However, noise levels on Sites 2 and 3, which presently include a car and truck dealership and manufacturing/industrial uses, respectively, are likely to be similar to existing conditions after redevelopment, as site uses would remain similar.

Operational noise levels at all three prototype sites would be regulated by the city standards provided in Table 6-1. All three sites are zoned for industrial use and are situated next to industrial use zones; as a result, permitted noise levels would generally be the highest allowed by the city.

Mitigation Measures

The city could require the use of mufflers, sound walls, or other noise-reducing measures where construction occurs close to sensitive noise receptors (e.g., schools, senior housing, hospitals).

Unavoidable Adverse Impacts

Noise levels would increase temporarily during the construction of projects under the MIC implementation plan.

Hazardous Waste

Existing Conditions

The various laboratory activities and manufacturing processes taking place in the MIC require materials and generate wastes classified as hazardous under federal and state law. Typical examples of hazardous materials used in the manufacturing process include paints, solvents, and petroleum products, while examples of dangerous wastes include caustics, acids, solvents, paints, metals, used petroleum products, wastewater, and other wastes.

The Boeing Company's Plant 2 site is included in EPA's Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) listing. The EPA has established this list based on industry spill notifications to the agency.

Existing Plans and Regulations

Dangerous wastes and hazardous materials are addressed by a number of regulations, and facilities that use such materials or generate such wastes must comply with a variety of specific requirements. A number of federal, state, and local laws pertain to the storage, handling, use, and transport of hazardous waste in the MIC. These laws are discussed in Appendix D.

Impacts

The authority to regulate hazardous wastes is largely the responsibility of federal and state agencies. The city does not have any regulations that specifically address the handling of hazardous waste. However, onsite hazardous waste treatment or storage facilities are not permitted in the MIC/H or MIC/L zones unless clearly incidental or secondary to a permitted use on the site. Any onsite hazardous waste treatment or storage facility is subject to state siting criteria (RCW 70.105).

Use and generation of hazardous substances on any of the three prototype sites would have to be in compliance with all applicable federal, state, and local regulations. Increases in laboratory space at Prototype Sites 1 and 3 would likely involve storage and handling of hazardous materials and generation of hazardous wastes. A warehouse and distribution center, as illustrated by Site 2, could store hazardous substances. The manufacturing use at Site 3 would likely involve handling, storing, and generating hazardous substances.

A variety of measures would be required for development or redevelopment on any of the prototype sites to prevent accidents or other incidents leading to the release of hazardous substances. These measures include emergency prevention and response equipment, procedures, and training; containment areas for stored substances; monitoring systems to identify leaks or spills; training of personnel handling substances; coordination with other responding agencies; and promulgation of information about the substances.

The Washington State Model Toxics Control Act (MTCA) would require the assessment of soil quality on the prototype sites, including the need for soil removal, treatment, or disposal. The quality of groundwater on a site or the presence of subsurface buried objects such as unknown underground storage tanks or utility pipelines must also be assessed. If contamination is found, Ecology must be notified and a cleanup action plan developed. The plan must identify cleanup methods and standards, as well as procedures for remediation or offsite disposal.

Existing PSAPCA regulations address the handling and removal of asbestos, such as might be encountered during demolition of existing structures (for example, as indicated for redevelopment at Prototype Site 3). Asbestos must be removed and disposed of by a qualified asbestos removal team before or during demolition.

Mitigation Measures

None identified.

Unavoidable Adverse Impacts

None anticipated.

Surface Water (Drainage/Grading and Floodplains)

Drainage and Grading

Existing Conditions

The MIC is located largely in the 2,900-acre Fire District #1 basin as identified in the City of Tukwila Surface Water Management Comprehensive Plan (1993). The basin stretches along the east side of the Duwamish River from approximately the Black River and S. 123rd Street north to Boeing Field. The basin is composed of several sub-areas that drain to the Duwamish River. Areas along the west side of the Duwamish River are located in the Fostoria basin, as identified in this plan.

Both the Fire District #1 Basin Drainage Plan and the Fostoria Basin Drainage Plan address water quantity issues. Updates to these basin plans are expected to incorporate water quality issues, as well as quantity. A water quality management plan for the Fostoria basin is

currently being prepared, and it is anticipated that updates to the basin plan for the Fire District #1 Basin, covering the majority of the MIC on the east side of the river, will address water quality, as well.

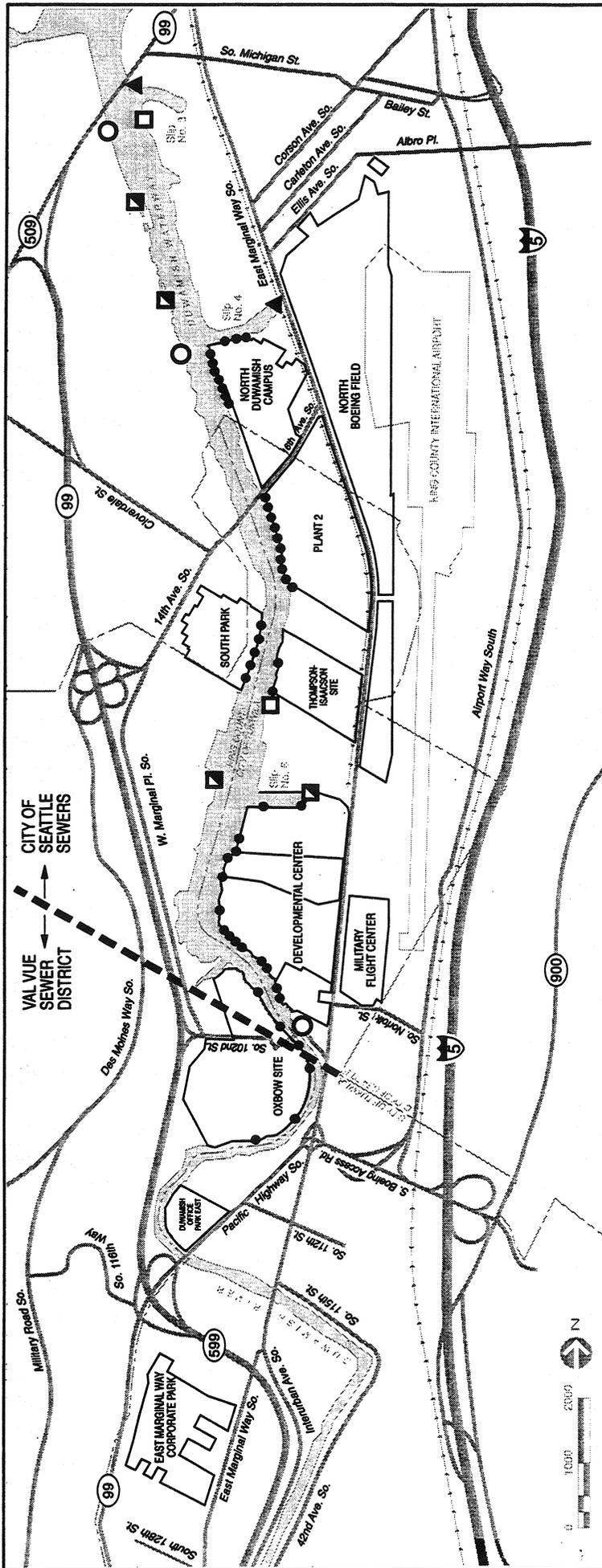
Due to previous development, much of the MIC is covered by impervious surface composed largely of parking lots, roadways, runways, buildings, and other paved areas. Commercial and industrial buildings in the MIC are characterized by large, impervious roof areas. Storm drainage from paved areas and roofs throughout the MIC is generally collected in, and flows through, a system of catch basins and storm drains, through stormwater trunk lines, via ditches, or directly overland to outfalls along the Duwamish River. All stormwater in the MIC discharges at one of several points along the Duwamish River (see Figure 6-3). Current stormwater discharges are largely untreated; however, The Boeing Company has installed oil/water separators on many of its sites. Most commercial/industrial businesses east of Marginal Way have their own private outfalls. There is also a well-developed drainage system associated with Interstate 5.

Existing Plans and Regulations

Ordinance 1755 established a storm drainage utility and rate structure to regulate storm and surface water and use of drainage facilities in the city. Approved storm drainage is required for all construction creating more than 5,000 square feet of new impervious surface; when stormwater runoff is collected and concentrated from an area of more than 5,000 square feet; or when development abuts or contains a floodplain, stream, wetland, lake, closed depression, or sensitive area as determined by the Public Works Director. The city requires all point discharges of stormwater to be directed to either a public storm drainage system or an approved private system. Offsite improvements, such as construction of a public storm drain system, can be substituted for onsite detention and water quality requirements if such improvements are of equal function in the opinion of the City Engineer. The design of stormwater facilities must be consistent with the draft King County Surface Water Design Manual (King County, 1996) or Ecology's Stormwater Management Manual for the Puget Sound Basin (Ecology, 1992), whichever is more stringent in a particular situation.

Ordinance 1755 also contains eight core requirements that regulate the quality and quantity of stormwater produced by a site. Among these requirements are the following: peak runoff rates must be limited to predevelopment peak rates; water pollution impacts must be mitigated; and discharge must occur at the predevelopment location and/or produce no significant adverse impact. There are also 13 special requirements in the ordinance pertaining to issues such as developments creating over 50 acres of impervious surface; high levels of vehicular use; storage of chemicals onsite; and use of wetlands, lakes, or closed depressions for runoff control. The satisfaction of both core and special requirements is determined by the Director of Public Works during drainage review.

In accordance with the 1993 Surface Water Management Plan, the city has implemented a regular monitoring and maintenance program to ensure the proper functioning of catch basins, swales, ditches, and stormwater pipelines. Manholes are also regularly cleaned, and the city is installing sediment traps in catch basins and working to identify illicit connections. A number of capital improvement projects in the MIC have also been completed in the MIC in response to the 1993 plan. These include the East Marginal Way South Street improvement program, currently underway; the Norfolk Drainage Project, now completed, which reduced Martin Luther King Junior Way flooding at Ryan Way; and the Washington



LEGEND

- Points where Boeing storm sewers flow into Duwamish Waterway
- Metro CSO
- ◻ City of Seattle stormwater outfall
- ◻ City of Seattle CSO
- ▲ Metro CSO with Seattle CSO and/or storm

Source: The Boeing Company
Tanner, C. D., 1991

**Figure 6-3
Existing Storm Sewers**

State Department of Transportation (WSDOT) high-occupancy vehicle (HOV) program, which provided water quality detention ponds on the west side of Interstate 5, just north of the Boeing Access Road, improving water quality and reducing flood impacts. Further improvements are soon to be recommended as an outgrowth of the water quality management plan for the Fostoria basin.

The Land Alteration Ordinance (Ordinance 1591, TMC Chapter 16.54) regulates all land disturbance during construction to control erosion and sedimentation, prevent damage to public or private property or public stormwater systems, prevent water quality degradation, and supplement excavation and fill requirements contained in the Uniform Building Code. A permit is required for excavations more than 5 feet deep, or for fill of more than 3 feet in vertical depth, and involving more than 50 cubic yards of material, or for the creation of impervious surface or clearing of a cumulative surface area of 6,000 square feet or greater. Application for a Land Alteration Permit requires a site map and grading plan, soils report, and other elements, as specified in the Land Alteration Ordinance. Approval is granted by the Public Works Director. Sedimentation and erosion control devices consistent with the King County Surface Water Design Manual are required for a land-altering activity involving more than 6,000 square feet. All sediment generated by the activity must be kept within the boundaries of the site during construction. All work must be performed in accordance with a land-altering plan approved by the City Public Works Director.

For sites proposed for demolition, an ordinance requires that stormwater outfalls be consolidated and that abandoned stormwater lines be removed or grouted.

Impacts

Grading and drainage impacts throughout the MIC would be minimized through compliance with existing city regulations. These regulations are intended to minimize both short-term erosion and sedimentation impacts during construction and long-term impacts from stormwater runoff.

Development on all three prototype sites would be of sufficient size to trigger the need for a land altering permit during construction. Applicants at all three prototype sites would be required to submit a grading plan that included measures to limit the area of grading and identify sedimentation and erosion control devices that would be used consistent with the King County Surface Water Design Manual. Compliance with city requirements would minimize any potential significant impacts during construction.

If existing storm drainage on the sites is inadequate, development on prototype Sites 1 and 3 would trigger the need for a storm drainage permit due to the size of proposed developments (475,000 square feet and 50 acres, respectively) and proximity to the Duwamish River. Development of Site 3 could also trigger the application of Special Requirement #3 of the city's drainage ordinance, which requires a master drainage plan for commercial or residential developments that would result in the creation of more than 50 acres of impervious surface. However, it is unclear as to whether this special requirement would apply to industrial uses or to the redevelopment of a previously developed site.

The applicability of Ordinance 1755 to Site 2 is also unclear for two reasons: the site is not adjacent to the Duwamish River and has been previously developed. Section 1.5(A) of the ordinance specifies that approved storm drainage is required when more than 5,000 feet of new impervious surface is created or when runoff is collected and concentrated from an

area of more than 5,000 square feet. However, Section 1.5(B) does not specify the applicability of the ordinance to industrial development, nor does it provide specific guidance on redevelopment of previously developed areas.

Other special requirements pertaining to vehicular use of impervious surfaces (#6), floodplain delineation (#9), design of flood protection facilities (#10), soils analysis (#12), or source control (#13) could also apply to any of the prototype sites, or other properties in the MIC, based on site-specific conditions. Similar to other sections of the ordinance discussed above, the applicability of these requirements to industrial development or redevelopment projects is unclear.

Mitigation Measures

Amend Ordinance 1755 to clarify that the ordinance's requirements for drainage review, master drainage plans, and other core and special requirements apply to industrial sites and to the redevelopment of existing sites.

Unavoidable Adverse Impacts

None anticipated.

Floodplains

Existing Conditions

The Duwamish River flows through the MIC. All of the corridor of the MIC along the Duwamish River is located just above the 500-year floodplain as designated on the Federal Emergency Management Agency's Flood Insurance Rate Map (FIRM) for Tukwila. Extensive Green-Duwamish River valley flooding has been limited to the river banks by the elimination of flow from the Black River, the partial channelization of the Green/Duwamish River, and the construction of the Howard Hanson Dam in 1962. Each of these measures reduced floodplain areas and made more land available for new, higher-intensity uses.

Existing Plans and Regulations

The City of Tukwila participates in the National Flood Insurance Program (NFIP). To participate in this program, the NFIP requires cities and counties to adopt regulations for floodplain management and prevention of flood damage to buildings. Ordinance 1499 (amending Ordinance 1462) updated TMC Chapter 16.52 to include such policies.

Construction activities in floodplains are regulated by the city through the issuance of a floodplain development permit. The city requires all new construction and "substantial improvements" to existing structures in floodplains to be anchored to prevent flotation, collapse, or lateral movement. Critical facilities are to be located outside the limits of the base floodplain, or, if no such alternative exists, are to be floodproofed and elevated above the base flood level. Generally, no construction is allowed in designated floodways or areas of high water velocity and debris flow, unless a certified engineer or architect demonstrates that encroachments shall not result in any increase in flood levels during base floods. Proposed developments are also evaluated for their cumulative effect on flood elevations; generally no development, in combination with other existing or anticipated development, shall increase the elevation of the base flood more than 0.2 foot at any point along the river.

Impacts

Prototype Site 3, which would include redevelopment over the existing channel of the Duwamish River, would likely be located in a designated floodway. Redevelopment of this site per existing city flood control regulations would require the applicant to demonstrate to the city that measures have been taken to anchor and otherwise floodproof the structure against high velocities of water and flood debris.

Mitigation Measures

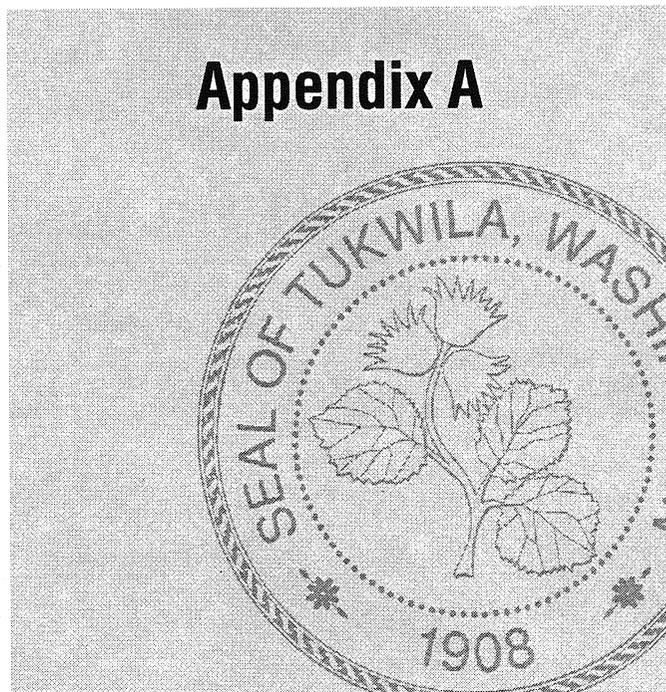
None identified.

Unavoidable Adverse Impacts

None anticipated.

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Appendix A



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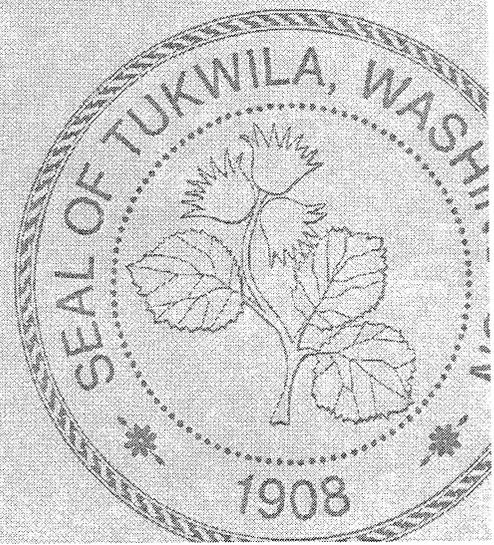
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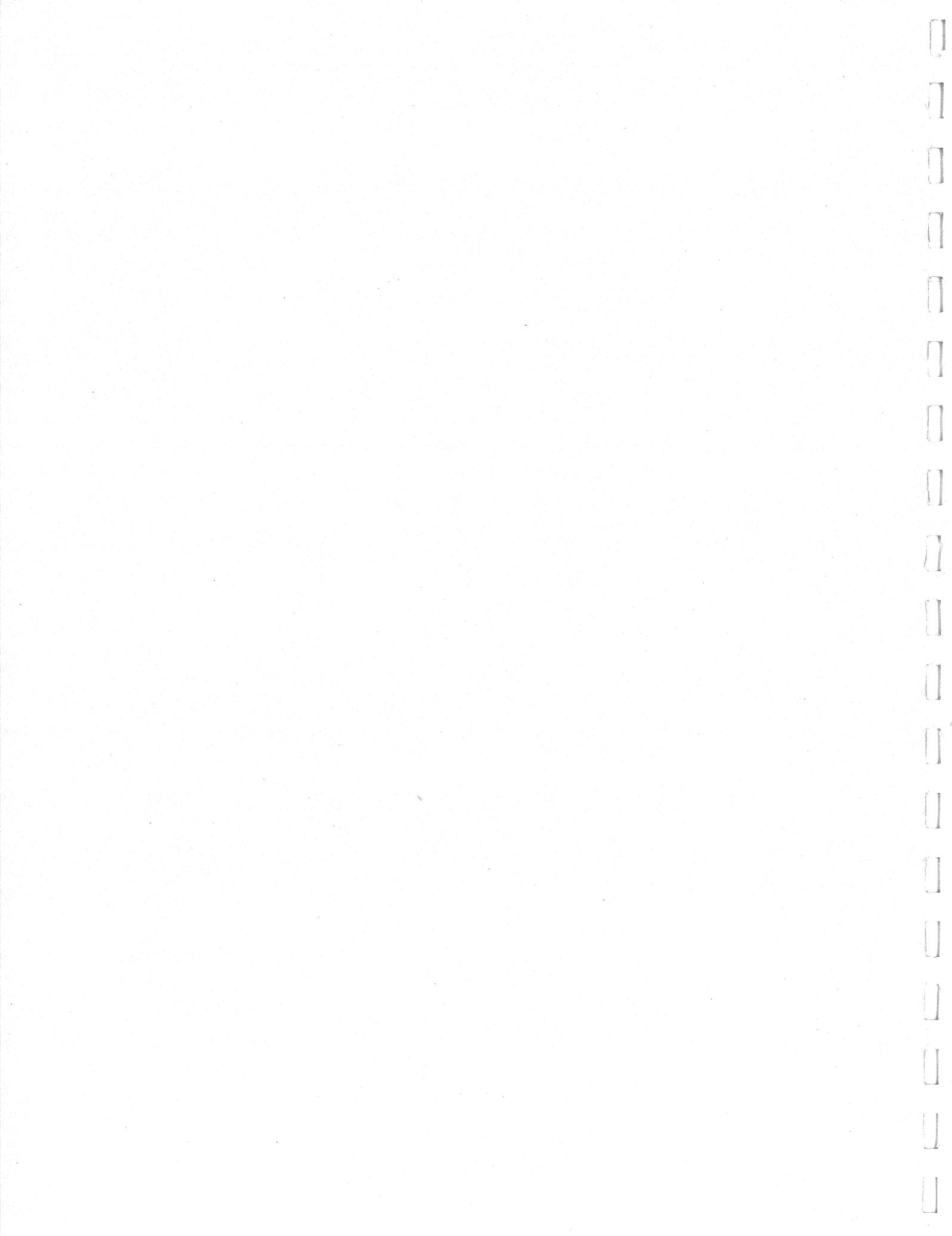
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SEATTLE TIMES - LEGAL NOTICES

Appendix B





Appendix B-1
Existing Conditions and Proposed
Shoreline Master Program for
the Manufacturing Industrial Center

**Existing Conditions and Proposed Shoreline
Master Program for the Manufacturing and
Industrial Center**

**City of Tukwila
May 8, 1997**

This document was prepared to serve two purposes. The most immediate need was to identify the existing shoreline conditions and the proposed Shoreline Master Program (SMP) goals, policies and regulations for the purpose of completing a Planned Action EIS for the Manufacturing and Industrial Center. This preliminary work will provide the basis for development of a Citywide shoreline master program, a process which is expected to be completed later in 1997.

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I Shoreline Zone Existing Conditions

Study Area

The discussion below pertains to the shoreline zone located within the City of Tukwila Manufacturing and Industrial Center (MIC). The shoreline zone includes the Duwamish River/Waterway within 200 feet of the ordinary high water mark of the river.

Land Use

The shoreline areas are dominated by sites used for manufacturing and office functions. Boeing controls roughly 75-80% of the property located on the right (east) shoreline from the north city limits south to Norfolk Street and uses it for office, lab and manufacturing functions. The remaining major sites along this corridor consist of Rhone Poulanc, a site previously used for food product manufacturing that is now used for storage of shipping containers, and manufacturing plants for Jorgensen Steel and Kenworth Trucks.

Across the river and to the south is the 31+ acre Oxbow site which provides as much as 9 acres of parking, a mail processing plant and an office building.

On these large sites, the vast majority of the land area, buildings and activities are located outside of the shoreline zone. For example, between the river and East Marginal Way the sites average a depth of about 1300 feet. Only the westernmost 200 feet, or 15% is within the river zone.

The character of the sites near the intersection of Highway 99 and the Boeing Access Road is significantly different as they are much smaller, many of which are fully contained within the shoreline. Several small industrial buildings are clustered on these sites, with relatively little room between Highway 99 and the shoreline. Further south the area opens up to moderate sized sites that are either underutilized or vacant.

Boeing customer service center, with 378,000 square feet of office space is located northwest of the intersection of the river and Highway 99. This 13 acre site is fully developed with two office buildings surrounded by parking.

In addition to the Oxbow, on the left bank (west) are a variety of industrial sites including the Gateway North Business Park, Sea King industrial park and a small industrial/outdoor storage area south of the turning basin.

Roads and utilities, including the Seattle City Light substation, are developed along roughly 16% of the shoreline within the MIC.

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The Green River Trail is located along the left bank of the river from East Marginal Way south to Pacific Highway. The trail crosses the river at Pacific Highway and follows the river on the right bank until the pedestrian bridge near the North Wind Weir site, where once again it crosses. At this location King County is developing the North Wind Weir Park at the river's edge. North of the park, the trail departs from the shoreline zone and follows West Marginal Way.

Terrestrial, Wetland, and Aquatic Habitats

General

This section describes the existing terrestrial, wetland and aquatic habitats along the Duwamish River as it passes through the Tukwila MIC. The area extends from the Allentown neighborhood just west of 42nd Avenue South downstream to the northern city limits just north of the 16th Avenue South bridge and includes the shoreline within 200 feet on either side of the channel. Much of the material in this section has been drawn from the document by Tanner (1991), who identified and mapped existing habitats and described potential restoration sites in the Duwamish River estuary. Other sources of information included wetland, stream, and habitat inventories by the U.S. Fish and Wildlife Service (USFWS, no date) and the City of Tukwila (City of Tukwila 1993; 1995; Jones and Stokes 1990). A search of agency databases for documented occurrences of rare, threatened, and endangered species, priority habitats, and high quality ecosystems was also conducted, which had negative results (USFWS 1996; WDFW 1996; WNHP 1996). In addition, surveys of the river environment were made by canoe in September 1996 and by car on January 29, 1997.

Background

The Duwamish River is the dominant biological, as well as physical, feature in the Tukwila MIC. Prior to settlement and development by Euro-Americans over the last 100 to 150 years, the area within the MIC was largely estuarine wetlands associated with the Duwamish River (Tanner 1991). This riverine-estuarine system was fed by drainage from Lake Washington, Lake Sammamish, the Cedar River (via the Black River), the Green River, and the White River, a total drainage basin area of 1,642 square miles. Discharge in the Duwamish River ranged from 2,500 to 9,000 cubic feet per second (cfs). Wetland habitats within the Duwamish River estuary consisted of higher intertidal areas with forests and shrub lands and lower intertidal marsh areas dominated by sedges, rushes, and other herbaceous plants.

The present conditions of the Duwamish River and its shoreline are drastically different from this pre-settlement ecosystem. The river was channelized and

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much of the drainage basin was rerouted through Lake Washington and the Hiram H. Chittenden Locks, resulting in a decrease in mean annual flow to about 1,530 cfs. Ninety-eight percent of the wetlands were lost through diking, filling, and changes in hydrology (Grette and Salo, 1986). By 1921, the river was dredged from its mouth to the Turning Basin, and the river is now maintained as a Federal navigation channel by the U.S. Army Corps of Engineers. The authorized navigation channel in the MIC is 150 ft wide and 15 deep upriver to the bend just south of the 16th Avenue Bridge and 12 feet deep south to the turning basin (NOAA National Ocean Survey chart 18450). In addition to the channel, private dredging has increased depths to 12 or 15 ft at wharf approaches, and in marinas and slips in the MIC.

Despite the extensive alterations that have taken place in the Duwamish River ecosystem, a variety of wildlife and fish use the remaining habitat. Tanner (1991) compiled lists from several sources that document observations of 84 bird, 20 fish, and 9 mammal species in the Duwamish River estuary in its present configuration and land use. Tanner also surveyed and described locations where restoration or enhancement of nearshore, saltmarsh and riparian habitats could be accomplished. Several of these projects are underway or under consideration by organizations including METRO, the City of Seattle, the Port of Seattle, and the Muckelshoot Tribe.

The most important upland habitat features in the MIC are the limited areas of substantial riparian vegetation. Primary species include large cottonwoods (*Populus trichocarpa*), big-leaf maple (*Acer macrophyllum*), red alder (*Alnus rubra*), box elder (*Acer negundo*), willows (*Salix* spp.), and some exotics such as Lombardy poplar (*Populus nigra* var. *italica*) and locust (*Robinia* sp.). These vegetated areas provide habitat for a number of small mammals and passerine birds that otherwise would be absent from the MIC. The larger trees along the river provide important perching and roosting habitat for birds such as crows (*Corvus* spp.), gulls (*Larus* spp.), kingfishers (*Ceryle alcyon*), cormorants (*Phalacrocorax* spp.), and perhaps ospreys (*Pandion haliaetus*) and great blue herons (*Ardea herodias*). Large trees also provide shading of adjacent waters and occasionally fall in and provide instream habitat for small fish. Emergent limbs and roots provide perches closer to the water. Extensive portions of the riverbanks just above the ordinary high water line are dominated by Himalayan blackberry (*Rubus discolor*) thickets that provide limited habitat for small mammals and birds.

Perhaps the most important ecological function of this reach of the river is its role as a migration corridor for downstream migrating anadromous salmonids (smolts) (Grette & Salo, 1986). The river and the Green River upstream have runs of Chinook, coho, chum, and pink salmon (*Oncorhynchus tshawytscha*, *O. kisutch*, *O. keta*, *O. gorbuscha*), as well as sea-run steelhead, cutthroat and Dolly Varden (*O. mykiss*, *O. clarki*, *Salvelinus malma*, respectively). The

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transition area from fresh to salt water is important both in allowing smolts to adjust their physiological processes for salt water living and as a feeding/rearing area (Levy & Northcote, 1982); it is well known that larger smolts are better able to survive the rigors of their early marine life history.

At and below the high tide line, the intertidal shorelines of the lower Duwamish River include a variety of natural and artificial habitats. The artificial habitats (vertical bulkheads, sloped riprap, and miscellaneous debris such as concrete slabs) may be less productive (e.g., support fewer prey organisms for smolts) than the more natural mud banks and the limited remaining mudflats, however, lower in the estuary, these hard substrata become colonized with a productive assemblage of rockweed (*Fucus gardneri*), barnacles (*Balanus glandula*), and mussels (*Mytilus trossulus*). Also, in areas where substantial amounts of silt have accumulated in the interstices of riprap or rubble, the habitat may support populations of epibenthic zooplankton that approach or exceed densities on muddy shorelines (Pentec, 1996). Steeper slopes of bulkheads and most riprapped areas are perceived to have the potential to increase vulnerability of juvenile salmonids to predation from fish or diving birds; however, steeper shorelines may reduce the vulnerability of small fish to predators such as kingfishers and herons.

In areas where the slopes are relatively flat (e.g., 3h:1v or flatter) and the substrate is unconsolidated sand or mud, a fringe of brackish or saltmarsh vegetation may be established. This habitat type is considered to be valued because of the production of organic detritus from the marsh that is transported downriver and as a productive habitat for crustacean and insect prey for fish and birds (Healey, 1982, Grette & Salo, 1986). A green saltmarsh edge is also an aesthetic amenity to the limited recreational users of the river.

The majority of the lower intertidal and the subtidal river bed is silty sand or mud that is moved at various rates by tidal and river currents. This habitat, especially the shallower areas adjacent to dredged bottoms where benthic primary productivity is high, are very productive and have good densities of epibenthic zooplankton which are important prey for juvenile salmonids, other small fish, and shorebirds. Low gradient mud bottoms are considered to be highly valued as migration corridors for juvenile salmonids offering both a good prey base and shallow water escape from predators such as fish and diving birds.

Mud and sand bottoms in the navigation channel and connecting dredged areas provide habitat for brackish water tolerant species such as starry flounder (*Platichthyes stellata*) and Dungeness crab (*Cancer magister*); use by these species declines with distance upstream and is probably limited above the Turning Basin.

Sediment quality in some areas has been degraded by historic discharges from

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North Wind Weir to Turning Basin

North Wind Weir is a rocky outcropping that crosses the channel creating a small rapid at extremely low tides (Warner and Fritz 1995). It is reported to be a traditional Native American fishing site (David Rice, personal communication, as cited in Tanner, 1991). A gill net set here on January 29, 1997 was being raided by a young California sea lion (*Zalophus Californian*) which was observed taking several steelhead from the net. The left bank directly below the new Green River Trail bridge is rippapped with old tires, below which a large eddy is eroding into a vacant area planned for development by King County as the North Wind Weir Park. Along with landscaped areas, the design for this park will also include a wetland slough area connected to the river (Elliot Bay/Duwamish Restoration Program 1996).

As the channel proceeds east from this point, the shoreline becomes unconsolidated material and has a more gentle slope. A small intertidal marsh area having patches of sedge (probably *Carex lyngbyei*) occurs along the left bank, above which is a stand of shrubs and trees, including some large cottonwoods. This area has significant terrestrial, wetland and shallow water habitat value for fish and was identified as potential restoration Site 2 by Tanner (1991). The adjacent upland area is now a major Postal Service facility.

The right bank below North Wind Weir was also identified as a potential restoration site (Site 1) by Tanner (1991). The shoreline has a fairly low, unconsolidated bank and has vegetation consisting of a patch of willow in the area of the weir and extensive areas with blackberry downstream. The edge of the channel has exposed mudflat areas with some emergent vegetation, including patches of *Carex lyngbyei*. The land above the channel bank is under commercial and light industrial land use and currently has little vegetation.

As the channel turns northeast, just south of the Boeing Access Road, the shoreline area above the left bank is landscaped for about 1,000 feet and then is bordered by parking lots. There is a short segment of steep, actively eroding bank below the bike trail, which follows the shoreline in this portion of the river, but most of the channel bank is less steep and well-vegetated (with reed canarygrass) downstream.

North of the Boeing Access Road, the right bank of the channel is situated immediately adjacent to East Marginal Way South and is bordered by riprap. As the river veers away from East Marginal Way South, the shoreline area is entirely industrial, primarily occupied by the Boeing Company. There is a small landscaped park between a Boeing parking lot and the river just north of the small bridge accessing the Boeing parking area.

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Downstream of this park, the Norfolk combined sewer outfall enters the river on the right bank and downstream of this outfall, mudflats are exposed at low tide on both sides of the river. On the left side of the river, these flats extend downstream into the Turning Basin area.

Turning Basin to Duwamish River Park

The Turning Basin is a wider portion of the river that is utilized as a sedimentation basin and is the end of the federal navigation channel periodically dredged by the Corps of Engineers (Tanner 1991). The left side of the basin has a small embayment, at the head of which is the mouth of a small tributary stream which enters through culverts under West Marginal Place. Significant intertidal mudflats occur along the sides of the embayment and are contiguous with mudflats upstream along the left bank. There has been a recent project to restore portions of the mudflat and adjacent shoreline with native species (the 'Coastal America' project, in potential restoration Site 3 of Tanner). A small 2.1-acre area of undeveloped fill deposits is located along the northwest side of Turning Basin, identified as potential restoration Site 4 in Tanner (1991).

The right bank of the Turning Basin area is steep riprap, with Boeing industrial facilities immediately above the bank. There are, however, significant intertidal mud flats mapped in this area by Tanner (1991), which are apparent below the riprap at low tide and offer shallow water habitat adjacent to the dredged channel.

Downstream of the Turning Basin, the shoreline is highly developed, and the channel is mostly bordered by riprap and sheet piling on both sides. Below these hardened shorelines, low intertidal and shallow subtidal mudflats border the navigation channel on both sides, offering shallow water habitat at lower water levels. An additional feature in this reach of the river is a 25-acre parcel of land on the left bank just north of the Seattle City Light substation. According to Tanner (1991), this site consists of fill accumulated from the dredging of Turning Basin. It is currently open grassland that is regularly mowed and is bordered mostly by blackberry. Ham Creek flows along the perimeter of this open area, and there has been some riparian restoration along the creek at the west side of the parcel undertaken by "I'm a Pal" (International Marine Association Protecting Aquatic Life). The entire parcel has been identified for restoration by several groups, including "I'm a Pal" and the Port of Seattle-EPA (Site 5 in Tanner 1991).

Other patches of terrestrial and wetland wildlife habitat include a strip of shrubs and trees along the left shoreline adjacent to a Boeing research facility (just north of South Director Street) and some broader intertidal mudflat areas just north of Slip 6 off the Duwamish Waterway. Slip 6 and the area just north of the Duwamish Yacht Club (including a small drainage channel entering the river)

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were identified as potential restoration sites 6 and 7, respectively, in Tanner (1991).

The left bank of the river both upstream and downstream of the 16th Avenue South Bridge is riprapped with only limited areas of lower gradient mud or debris banks and little riparian vegetation. At the lowest tides, a strip of mudflat is exposed downstream of the bridge.

The right bank upstream (south) of the bridge is dominated by Boeing Plant 2 structures which extend over the shoreline on pilings. A wall of horizontal timbers on the outer line of pilings protects the underside of the building and partially isolates the river bank under the building from the river. At low tide, mudflats are exposed in front of Plant 2 and offer shallow water habitat to migrating fish. This continuity of habitat is limited, however, by the timber wall at higher tides.

North (downstream) of the 16th Avenue South Bridge, another Boeing structure similarly extends on pilings partially over the mudflats; horizontal timbers are also placed on the outer line of pilings with similar habitat implications although the mudflat between the structure and the navigation channel is broader than that adjacent to Plant 2 south of the bridge.

Habitat Protection and Restoration Sites

An inventory of potential habitat protection or restoration sites was recently prepared by consultants to the City of Tukwila (Williams/Pentec). For the MIC portion there was one site identified as important for protection and five sites as potential habitat restoration sites. Four of the latter were previously identified in a report prepared by Curtis Tanner for the Environmental Protection Agency (1991).

The primary criterion used by Williams/Pentec to identify sites for protection was the presence of significant stands of native woody vegetation. Given that the entire channel and banks of the Duwamish River within the city has undergone substantial alteration, there is virtually no undisturbed shoreline area present. Natural features have largely been modified by channelization, diking, rerouting of streams, filling, etc. In places there are patches of native shrubs and trees that provide some habitat features characteristic of low elevation, low gradient rivers in the Puget Sound Basin. Shading of the stream, input of large woody debris, roosting sites and forage for wildlife, and bank stabilization are some of the important functions that native shrubs and trees provide.

Criteria for potential restoration sites include wider places within the floodway, presence of some native trees and shrubs that could be further enhanced, presence of tributary streams with potential salmonid habitat, a low degree of

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development, and ownership by the City. It should be noted that almost any portion of the shoreline have potential for enhancement or restoration, since the area has been so extensively and severely altered from its natural condition. The sites identified here are merely those that present the best opportunities.

The location of the sites have been mapped on Figure 1. A brief description is provided below.

Important Areas for Protection:

Site P-9: Wooded shoreline area next to Postal Service facility. This site has recently been altered by the U.S. Postal Service facility. There is some shoreline that has not been developed that consists of relatively natural bank with emergent vegetation, shrubs, and a grove of trees.

Potential Sites for Restoration/Enhancement

Site R-19: Left bank adjacent to Boeing parking lot. This site could be enhanced with planting of native vegetation. In-channel restoration for fish habitat is most beneficial, but enhancement of riparian vegetation is also valuable for wildlife. Some limited opportunity, probably in conjunction with needed bank stabilization could be done here.

Sites R-17 - R-24 (except R-19): Port of Seattle/EPA designated sites. Seven sites identified in the study conducted by the Port of Seattle and EPA (Curtis, 1991) occur within the City of Tukwila. These represent the primary opportunities for restoring or enhancing estuarine conditions for juvenile salmonids, which is probably the most important biological function of this reach of the river.

A restoration project has already been conducted at one of these sites in the Turning Basin. Restoration projects at two other sites are planned as part of the Elliott Bay - Duwamish natural Resources Damage Assessment settlement, which may preclude their use for mitigation of City permitted projects (Tanner, 1996). These are the City Light South and City Light North sites identified by Tanner (1991).

Site R-17 is located across the street from the Boeing Customer Service Center on the right bank. It is known to be in an area that is important to salmonids for their transition from freshwater to saltwater. Mudflats, partially vegetated with sedges and other emergent vegetation occur along the shoreline. Shoreline and adjacent upland areas have good opportunity for creation of a diverse intertidal and related wetland habitat. The size, characteristics, location, and availability of this site make it probably the best opportunity for restoration.

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Site R-18 is located directly across the river from R-17. The shoreline consists of some riprap and relatively natural bank with emergent vegetation, shrubs, and trees. Much of the site has recently been redeveloped for a Postal Service facility, but there is some shoreline area that has not been developed. A diverse array of intertidal and wetland habitats could be created here.

Site R-20 is adjacent to the turning basin. It is 4.7 acres in size, about half of which is located upland. Sediments are deposited here, requiring periodic dredging by the Corps of Engineers. There is some intertidal vegetation present and a few trees grow at the top of the bank. The Port of Seattle is involved in restoration on this site as mitigation for a project located in Seattle.

Site R-21 is a 2.1 acre site immediately south of the City Light Substation on marginal Place SW. The shoreline consists of a mix of natural vegetation and riprap. Historically the site was tidal swamp with a small stream. It was filled around 1940.

Site R-22 is a 25 acre parcel north of the City Light Substation. The shoreline is riprap with a large intertidal bench located below the toe of the slope. Ham Creek flows to the river through a ditch adjacent to the roadway.

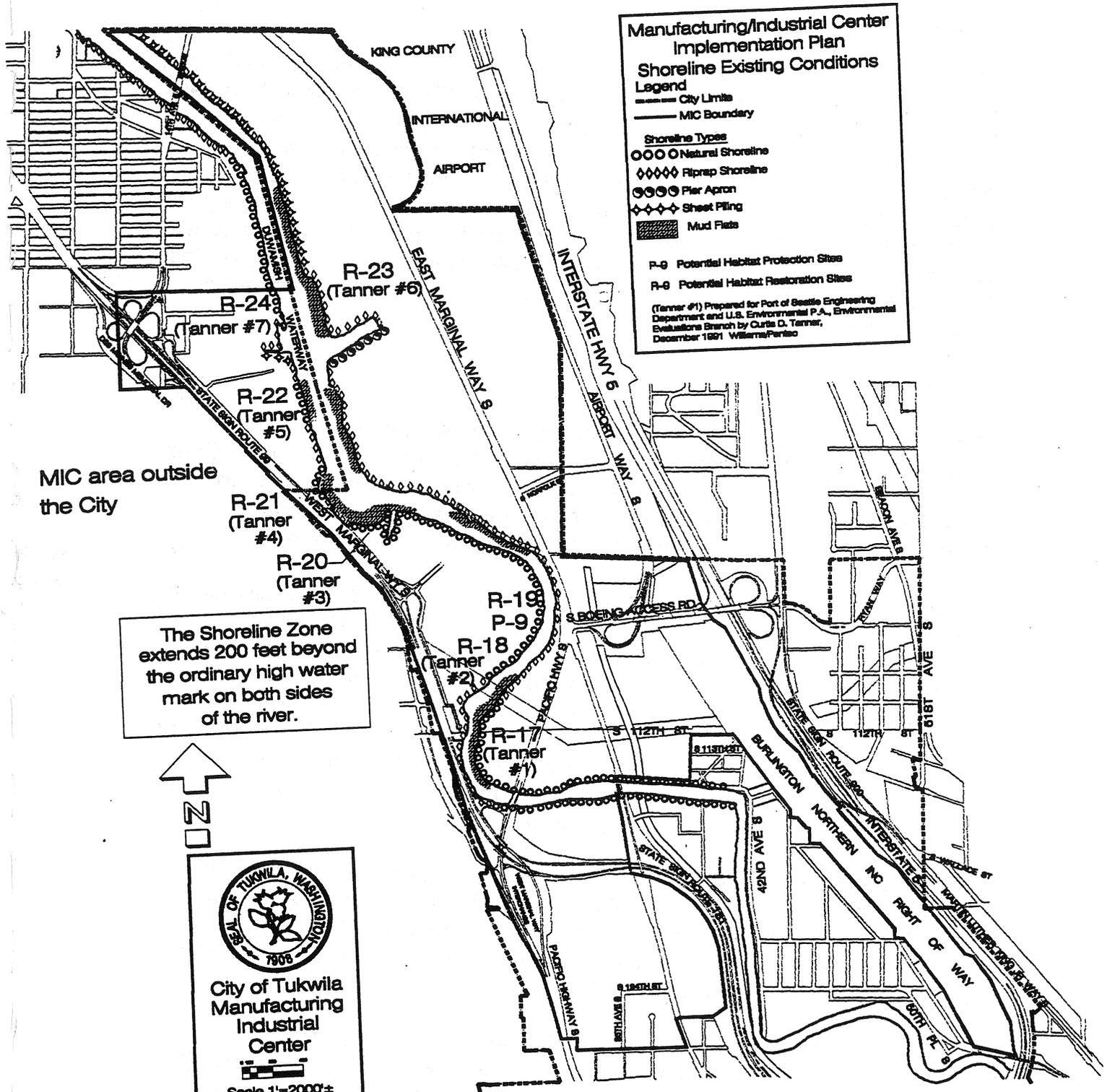
Site R-23 is a shallow side waterway off the main channel within the Boeing Company complex. It is no longer used for navigation and offers some opportunity for creating intertidal habitat and vegetated shoreline.

Site R-24 is a 4.7 acre parcel just north of the Duwamish Yacht Club. The shoreline is primarily riprap, but removal of riprap, regrading of the shoreline, and establishment of native riparian and emergent vegetation would create a significant patch of valuable fish and wildlife habitat.

Summary

Typical of an urbanized waterway, the Duwamish River within the Tukwila MIC has little natural terrestrial and wetland habitat. The river, its floodplain, and estuary have been highly altered since settlement by Euro-Americans, and most of the shoreline area along the river is under intensive industrial and commercial land use. This loss of natural ecological functions provided by the pre-development estuary has significantly affected the populations of many native aquatic and terrestrial species including several of economic value (Grette & Salo, 1986).

Much of the river bank is dominated by invasive species, such as Himalayan blackberry and reed canarygrass. However, there are portions of the bank dominated by native plant species such as alders, willows, and cottonwoods. Good examples of woody riparian vegetation are found in the southern end of



MIC area outside the City

The Shoreline Zone extends 200 feet beyond the ordinary high water mark on both sides of the river.



City of Tukwila
Manufacturing
Industrial
Center

Scale 1"=2000'±
March 18, 1997

Figure 1

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the MIC near Allentown and adjacent to the Postal Service facility downstream of South 112th Street. There are also patches of intertidal marshland on both sides of the river downstream of the North Wind Weir and in the Turning Basin.

There are several locations along the Duwamish River in the MIC that have been identified as potential restoration sites (e.g., Tanner 1991). Generally, these are areas that have some remaining undeveloped uplands behind the shoreline; typically, the restoration plans for these areas involve excavation of materials along the top of the banks, reductions in shoreline slopes, and replacement of hardened shorelines with native vegetation, gravel, sand, or mud. These actions are expected to create more extensive and natural intertidal habitat for juvenile salmonids and other fish as well as shorebirds and waterfowl. It is assumed that incremental increases in such habitats will incrementally improve changes for survival of these species in the area.

Project Area Shorelines

Before the turn of the century, the Duwamish River was fed by Lake Sammamish, Lake Washington, and the Cedar River by way of the Black, Green and White Rivers. In 1911, flow from the White River was diverted to Tacoma. Other diversion projects eliminated flows from the Black and Cedar Rivers. Today, the Green River is the only significant tributary to the Duwamish.

Dredging of the Duwamish River, completed in 1921, resulted in replacement of approximately 9 miles of meandering river with 4 miles of channel. This channel, now known as the Duwamish Waterway, is a marine-oriented waterway used primarily by the Port of Seattle to move waterborne cargo. The Duwamish is maintained by the Army Corps of Engineers as a navigable waterway to the turning basin, which is located just north of the Oxbow site. South of the turning basin, the river begins to take a more natural course and becomes the Duwamish River. The Duwamish Waterway remains one of the most industrialized water bodies in the Puget Sound area.

A report prepared by Curtis D. Tanner for the Port of Seattle and the U.S. EPA, "Potential Intertidal Habitat Restoration Sites in the Duwamish River Estuary," classified the shoreline areas along the Duwamish River and Waterway. Four classifications were identified: natural shorelines, riprap shorelines, pier aprons, and sheet piling. They are described below:

- **Natural Shoreline.** This classification does not indicate that the shoreline is in its original condition, but rather that the area generally exhibits a gently sloping shoreline with areas of fine-grained sediment.
- **Riprap Shoreline.** This refers to shorelines stabilized with angular rock, generally larger than 12 inches in diameter; slopes are relatively

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steep, ranging from 1:1 to 2:1. In some areas, fine-grained sediment may be present, as well as intertidal benches below the riprap area.

- **Pier Aprons.** These are generally concrete or wood pier structures where the water is allowed to flow underneath the pier, in between the vertical structural members.
- **Sheet Piling.** Sheet piles, also known as vertical bulkheads, divert the flow of water around the pier or landform.

The purpose of the Tanner Report was to identify potential habitat restoration opportunities in the Duwamish River estuary. There is roughly 33,000 linear feet of shoreline in the MIC. The shoreline classifications are shown on Figure 1.

Relationship to Land Use Plans and Policies

	City of Tukwila Zoning		King Co. SMP
	MIC/H	MIC/L	
Max. Building Height	125 feet	4 stories or 45'	35 feet*
Setbacks			
-Front	20 feet	20 feet	
- 2nd Front	10 feet	10 feet	
-Sides/Rear	None	None	
-Shoreline			
Water Dependent			0 feet
Water Related			20' from OHWM**
Non-Water Related			50' from OHWM***
Landscaping			
- Front	5 feet	5 feet	
- Sides/Rear	None	None	
- Shoreline			5' around perimeter of parking areas
*May be increased if view of substantial # of residents is not obstructed, permitted by the underlying zone and if the use is water related or water dependent. ** May be reduced to 10 feet with public access. *** May be reduced to 20 feet with public access.			

This section provides a discussion of the applicable land use plans, policies, zoning regulations, shoreline management master program requirements, and other regulatory constraints that apply to development along the Duwamish corridor.

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The comprehensive plan, zoning and shoreline plan are the primary planning tools used by the City of Tukwila to guide the use and development along the shoreline.

Table 1 summarizes the basic regulations from the zoning and shoreline master program that apply to MIC sites along the river.

Tukwila Comprehensive Plan: In the City of Tukwila's Comprehensive Plan (1995), the area is designated Manufacturing and Industrial Center (MIC) with subdesignations of Heavy (H) and Light (L).

Chapter Five of the Comprehensive Plan contains goals and policies for land use along the river. Specific policies have been developed for the MIC. The policies emphasize the importance of the economic value of the development along the river, the need to protect and enhance natural areas, provide public access and related amenities and encourage through design guidelines maintenance or enhancement of visual qualities along the river. The shoreline policies of the plan will be incorporated into a new shoreline master program later in 1997.

City of Tukwila Zoning: As with the Comprehensive Plan, the zoning designation of most of the study area is MIC/H (Heavy), with two parcels near the south end of the study area zoned MIC/L (Light). These zones are similar in terms of permitted uses and development standards. There are no standards or regulations specific for shoreline development. The setback, height and landscape standards are minimal and where the shoreline regulations are generally more restrictive, they would prevail.

City of Tukwila Sensitive Areas Ordinance: The Tukwila zoning code contains the City's sensitive areas ordinance (TMC Chapter 18.45) which regulates steep slopes, watercourses and wetlands. There are no mapped sensitive areas within the shoreline zone, however, the City maps are not a complete inventory, and development on any site is subject to confirmation of the presence of sensitive areas.

King County Shoreline Regulations: The City has not adopted its own Shoreline Master Program (SMP) for shorelines located in the project area. Thus, the City administers the 1977 King County shoreline regulations and will continue to do so until such time a new SMP is adopted. The goals, policies and objectives of this SMP are applicable to the study area:

- Emphasis should be given to developing visual and physical access to the shoreline in the Urban Environment (Policy 3).

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- To enhance the waterfront and insure maximum public use, industrial and commercial facilities should be designed to permit pedestrian waterfront activities consistent with public safety and security (Policy 5).

Redevelopment and renewal of substandard areas should be encouraged in order to accommodate future users and make maximum use of the shoreline resource (Policy 6).

The King County shoreline regulations include development standards for height, setbacks, and public access. The height limitation in the Urban Environment, unless the underlying zones are more restrictive, is 35 feet above average grade level (K.C.C. 25.16.030(B)). Provisions allow increased height if a substantial number of residential views are not obstructed, the height is allowed in by the underlying zoning standards and the use is water dependent or water related.

Commercial and industrial development are permitted provided that they are also permitted in the underlying zone. Non-water-related commercial and industrial uses must maintain a shoreline setback of either 50 feet from the ordinary high water mark or 20 feet from the floodway, whichever is greater. Non-water-related industrial uses may further reduce the setback if access to the shoreline is provided.

According to the King County shoreline regulations, "public access" means unobstructed access to the general public from land to the shoreline. "Limited public access" means that access to the shoreline is limited to specific groups of people or to specific times or that visual access is provided to the general public. The regulations require public access in the following circumstances:

Development proposed in shorelines of the state shall maintain setbacks provide easements or otherwise develop the site to permit a trail to be constructed or public access to continue where:

- There is a proposed trail in the King County Trail System; or
- Part of the site is being used and has historically been used for public access (K.C.C. 25.16.030(H)(1)(2)).

In addition to these limited requirements to provide new public access, the regulations also offer incentives for voluntary provision of public access. The setbacks identified above for commercial and industrial uses in the Urban Environment designation can be decreased if public access is provided. The setback can be reduced to 20 feet from the ordinary high water mark or 10 feet from the edge of the floodway, whichever is greater, if the development provides limited public access. The setback can be reduced to 10 feet or the edge of the floodway if full public access is provided.

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King County Recreation Plans

Green River Trail Plan: This plan was developed and has largely been implemented through Tukwila. When completed the trail will provide access along the river from the south city limits north to the Oxbow site, where the trail leaves the river and follows West Marginal Way. The plan has played a significant role in the developing of the policies for shoreline access in the City as evidenced in the discussion of the Tukwila Comprehensive Plan above.

II Proposed Shoreline Goals, Policies and Regulations

The City of Tukwila currently administers two sets of shoreline master programs (SMPs) and regulations for development along the Green/Duwamish River. Properties located south of the 42nd Avenue bridge are subject the City of Tukwila SMP. The properties north of the bridge were annexed subsequent to the adoption of the Tukwila SMP and as a result, the City has been administering the King County SMP since they were annexed.

Included in the City's goals for 1997 is to replace these two SMP's with the adoption of a new Shoreline Master Program and development regulations. The SMP is expected to be adopted in the second half of the year.

Substantial work has occurred on the provision of a consolidated SMP over the past five years. The most significant result is the development of the policy basis of the SMP as embodied in the Comprehensive Plan adopted December, 1995. The completion of this work was in part financed through a Coastal Zone Management Act grant administered by the Department of Ecology.

The discussion below is intended to describe the general approach the City is taking with the development of the SMP. The policies identified below have already gone through substantial public process and have been adopted by the City Council. The only change proposed to the policy basis is the addition of the restoration goal and principles of the habitat restoration plan prepared by the Duwamish Coalition.

The regulatory approach presented here implements the general direction of the adopted policies for the purpose of evaluation in the MIC planned action.

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Environment Designations

Goal 5.1 Shoreline Environment designations that meet Washington State Shoreline Management Act requirements, and reflect local conditions and Tukwila's long-term vision for its shoreline. The shoreline zone generally extends for 200 feet on either side of the Ordinary High Water Mark, consistent with the Washington State Shoreline Management Act.

5.1.1 Urban-Open Space Environment: In the Urban-Open Space Environment, priority shall be given to the following:

- Maintenance of existing single-family residential development patterns;
- Redevelopment of existing commercial and industrial areas, with enhanced access to the river;
- Protection and restoration of natural environment features and riverbank characteristics.

The following areas shall be designated as the Urban-Open Space Environment: The entire shoreline zone from the Highway 99 bridge upstream to South 205th Street.

5.1.2 Manufacturing/Industrial Center Environment: In the Manufacturing/Industrial Center Environment, priority shall be given to the following:

- Redevelopment of under-utilized areas and development of intensive commercial and industrial activities;
- Enhancement and restoration of access to the river;
- Protection and restoration of natural environment features and riverbank characteristics, where compatible with development.

The following area shall be designated as the Manufacturing/Industrial Center Environment: The entire shoreline zone from the northern City limits upstream to the Highway 99 bridge.

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Goals and Policies

The following are adopted goals and policies of the comprehensive plan that will apply to the MIC. Most were part of the Plan's shoreline element and intended to provide the policy basis for the 1997 update of the shoreline master program:

GOALS

- 1.5 A riverfront that is accessible, developed, and appreciated as a major amenity of the community and region.
- 5.2 Expanded value of the river as a community and regional resource through regional coordination of shoreline management programs and through programs that foster river awareness, involving partnerships among businesses, schools, government and community organizations.
- 5.3 Development along the shoreline that fosters the economic vitality of Tukwila while preserving the long-term benefits of the river.
- 5.4 Protect rights of property owners to reasonable use and enjoyment of private property, through appropriate location, access to, and design of shoreline uses.
- 5.5 Enhanced identity of the river as a unique community asset through high quality development and public activities which reflect Tukwila's history and sense of community pride.
- 5.6 Varied opportunities for public access to and along the river, including visual and cultural access, access to the water's edge, opportunities for small boat navigation and access, and connections to other neighborhoods.
- 5.7 Safe corridors and amenities for pedestrians, cyclists and users of public transportation, allowing more citizens to access and enjoy the river.
- 5.8 Recognition of the river's contribution to Tukwila history and community identity through identification, enhancement, restoration, and protection of sites with historic and cultural value and through development of interpretive and educational programs.

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- 5.9 Restored, enhanced, and protected natural environment resources along the river, including trees, wildlife habitat and features with value for long-term public, scientific and educational uses.
- 5.10 Improved water quality and quantity control programs affecting the Green/Duwamish River that improve the river's water quality, provide habitat for fish and wildlife, protect public health and safety, and enhance public enjoyment of the river.
- 5.11 Shoreline uses that do not endanger public health, safety, and welfare or the capacity of the river to provide long-term benefits and resources to the community.

POLICIES

- 1.5.1 Continue to develop the riverfront trail system and create "nodes" of public space for civic function, art festivals, and seasonal events. Include, in some places, hard-surfaced areas with a more formal appearance, such as textured paving, lighting, seating, and pavilions.
- 1.5.2 Install interpretive displays to inform the public of the river's environmental role in the community and the region.
- 1.5.3 Commission representative art reflecting local history, wildlife, vegetation, or climate for the pedestrian spaces along the river.
- 1.5.4 Provide more convenient public access and connections to the river so that it becomes more integral to City life.
- 1.5.5 Limit public access where there are issues of safety, security, or personal privacy or where there is a need to preserve wildlife habitat.

Shoreline Planning and Management

- 5.2.1. Coordinate shoreline planning and management activities with other local jurisdictions to establish region-wide consistency in addressing river issues with regional implications, such as economic development, public access, wildlife habitat, water quality control and flood control.

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- 5.2.2 Promote river stewardship and increase river awareness through actions which further shoreline goals, such as educational programs, community activities, and partnerships with Tukwila residents, businesses, schools, government, and community organizations.

Land Development Uses and Economic Vitality

- 5.3.1 Develop and implement River Design Guidelines to:

- Guide the design of multiple shoreline uses;
- Establish techniques for increasing multiple shoreline use;
- Prioritize locations for uses.

- 5.3.2 Design and locate all shoreline development to minimize impacts on areas identified as important for other river uses, such as wildlife and aquatic habitat, river vegetation, public access and recreation, historical resource and flood control.

- 5.3.3 Allow structures to be placed in the water, or structural reinforcement of the riverbank, only when this provides a significant, long-term public benefit, or are essential to a water-dependent use.

- 5.3.4 Allow flood control (e.g. levees) to be installed and maintained as necessary to protect the life, safety and welfare of the public and to protect the existing development patterns of the valley floor.

- 5.3.5 Recognize and promote the river's contribution to the economic vitality of Tukwila, as a valuable amenity for existing and future businesses which depend on or benefit from a shoreline location.

- 5.3.6 Ensure that shoreline development does not diminish the commercial navigability of the River.

MIC Development Policies

- 5.3.9 Ensure that shoreline development in the MIC that is not water-dependent either provides for shoreline multiple uses to the extent that site security and the success of industrial

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operations are not jeopardized; or provides adequate mitigation for the loss of shoreline multiple use opportunities.

5.3.10 Allow opportunities for commercial and recreational marinas to locate in Tukwila downstream of the turning basin, where compatible with existing and future navigability.

Private Property Rights

- 5.4.1 Design, locate and manage shoreline uses in a manner which maintains reasonable use and enjoyment of private property.
- 5.4.2 Design and locate public access in a way that is appropriate for the site, depending on site conditions and private property concerns.
- 5.4.3 Special sensitivity is required for residential property; therefore, all single-family residential development of four or fewer single-family residential lots is excluded from requirements to provide private or public access.
- 5.4.4 Maintain flexibility in methods of obtaining access, to allow for different site conditions and private property concerns that might conflict with access, such as privacy, safety, and security.

River Design Quality

- 5.5.2 Require that shoreline development in the MIC:
- Is designed to be consistent with Tukwila river design guidelines;
 - Maintains or enhances the existing visual quality along the river;
 - Provides trees and other landscaping to buffer industrial uses that are incompatible with other river uses;
 - Provides amenities that enhance enjoyment of the river by employees.

Access and Recreational Use

- 5.6.1 Retain and improve areas identified as important in the network of public access to the river, including cross-town connections, former railroad right-of-ways and unimproved street right-of-ways, historic sites, unique natural features or other areas valuable for their interpretive potential.

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- 5.6.2 Develop and implement comprehensive river access guidelines to guide the design, location and management of shoreline public access; to identify types of access appropriate for various site conditions and locations; and to establish strategies, funding sources and priorities for acquisition and enhancement of shoreline public access.
- 5.6.3 Design, locate and manage public access for diverse types and variable levels of intensity, in order to minimize impacts on vulnerable features of the natural environment and to minimize conflicts with private property uses.
- 5.6.4 Where shoreline development provides public access areas, reserve such areas for use by the public through the means most appropriate for the type, scale and impacts of the development, such as donation or sale of an easement or right-of-way to the City.
- 5.6.5 Support the implementation of the King County Green River Trail, per the existing King County Green River Trail Master.

Policy for Development in MIC

- 5.6.9 For MIC properties included in the King County Green River Trail Master Plan, require shoreline development to provide a trail for public access along the river.
- 5.6.10 Where shoreline public access is provided, ensure that it is designed to be safe and convenient and includes access amenities such as benches, drinking fountains, public parking areas, handicapped access and appropriate lighting, consistent with the river access guidelines.
- 5.6.11 For MIC properties not included in the King County Green River Trail Plan, require shoreline development to provide public access or a private natural area in lieu of public access, or otherwise mitigate the loss of public access.

Transportation Within the Shoreline Zone

- 5.7.1 Design and locate transportation uses within the Shoreline Zone to provide for shoreline multiple uses, such as trees or other habitat features, turn-outs or parking areas for public access, biofiltration swales to protect water quality, public art or interpretive signs.

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- 5.7.2 Ensure the transportation uses within the Shoreline Zone and within those corridors identified as river cross-connections provide safe, convenient and attractive pedestrian, bicycle and boater access and facilities for public transportation.
- 5.7.3 Minimize impacts to the natural environment (such as air, noise, odor or water pollution).
- 5.7.4 Encourage maintenance of the river's navigability up to the turning basin, where this achieves a greater public interest and a balance between costs and benefits to the broader community, in recognition of the historical significance of navigation and its importance to the economic vitality of water-dependent uses and the MIC.

Historical Resource Use

- 5.8.1 Ensure that shoreline development reflects the river's important role in Tukwila's history that long-term public use of the river as an historical resource is protected by providing for the identification, protection and interpretation of unique historic and archaeological features.
- 5.8.2 Ensure that public shoreline development reflects the river's natural features and community traditions.

Natural Environment and Habitat Use

- 5.9.1 Ensure that shoreline development minimizes impacts on wildlife and that significant vegetation, sandbars, wetlands, watercourses, and other areas identified as important for habitat are maintained through the proper location, design, construction, and management of all shoreline uses and activities.
- 5.9.2 Ensure that shoreline development and activities protect riverbank vegetation and, where feasible, restore degraded riverbanks, in order to minimize and compensate for impacts to fish and wildlife habitat.
- 5.9.3 Mitigate unavoidable disturbances of significant vegetation or habitat through replacement of habitat and provision of interpretive features consistent with the River access guidelines.

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Water Quality, Surface Water and Flood Control Use

- 5.10.1 Design, locate, and manage shoreline development including streets, flood control projects, surface water drainage and sewer systems, clearing and grading activities, and landscaping in a manner which minimizes opportunities for pollutants to enter the river, provides erosion control and otherwise protects water quality.
- 5.10.2 Design, manage, and mitigate flood control uses to minimize impacts to other shoreline uses such as trees and riverbank vegetation, public access and recreation, and fish habitat; and set them back from the river, where feasible for the project, with land areas between the water and the levee set aside as open space for public recreation or wildlife habitat.
- 5.10.3 Consistent with project feasibility, mitigate unavoidable negative impacts on other shoreline uses owing to flood control uses through such measures as restoration of trees and native riverbank vegetation, provision of public access to the water's edge, interpretive features, or other mitigation of loss of opportunities for shoreline multiple uses.

Public Health, Safety and Welfare

- 5.11.1 Design, locate, and manage shoreline uses, such as capital improvement projects and private development, in a manner which does not endanger public health, safety and welfare, or the capacity of the river to provide long-term benefits and resources to the community.

Manufacturing and Industrial Center - Protect the Land Resource

- 11.1.7 Support the Duwamish River becoming a natural feature amenity in the MIC.
- 11.1.8 Improve public access and use of the west side of the river, protecting owner's rights to reasonable use and enjoyment, improve employee access to the east side of the river, and emphasize restoration on both sides of the river.

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Duwamish Coalition Habitat Restoration Plan

In addition to the adopted goals and policies, the City is evaluating the possibility and appropriateness of adopting the restoration goal and principles of the Lower Duwamish habitat Restoration Plan prepared by the Ad Hoc Duwamish Habitat Restoration Group. This group was composed of representatives and staff from local, state, regional, federal, and tribal governments, business, environmental and community organizations and interested citizens. The goal and principles are as follows:

Restoration Goal: The goal of this restoration plan is to provide a diversity of self-sustaining habitat types and abundance within the Lower Duwamish Watershed to enhance fish and wildlife while maintaining a healthy, working waterfront of port, industrial, fisheries, and recreational uses.

Restoration Principles:

1. Provide a functioning and sustainable ecosystem.
2. Integrate a restoration strategies to increase the likelihood of success.
3. Coordinate restofation efforts with other planning and regulatory activities to maximize habitat restoration.
4. Involve the public in restoration planning and implementation.
5. Maintain a working waterfront of Port and industrial uses that transitions through mixed industrial, commercial, residential recreational and open space uses, depending on the neighborhood.

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Regulatory Approach

While the City has gone through substantial public review and citizen involvement in developing the policy basis for the SMP as contained in the comprehensive plan, specific regulations are only beginning to be identified, let alone reviewed in a public forum. As such, the regulatory approach discussed below is preliminary and general and subject to change as development of the Shoreline Master Program proceeds through 1997.

Permitted Uses

Uses permitted in the underlying zone, MIC(H) or (L), of the adopted zoning code (TMC Chapter 18) will be allowed within the shoreline zone. Priority is given to redevelopment of under-utilized areas and the continuous investment in industrial facilities which provide family supporting wages, implementation of the King County Green River Trail Plan for public access and alternative private access or intertidal area development otherwise, and protection and restoration of the natural environment features and riverbank characteristics, where compatible with development.

General

Height restrictions already exist in the zoning ordinance, the Boeing Field flight zone and the Shoreline Management Act. The MIC/L zone limits height to 4 stories or 45 feet and the MIC/H zone limits height to 125 feet. The Shoreline Management Act limits height to 35 feet when a substantial number of adjacent residential views will be obstructed. There are limited or no residential uses within the MIC. No additional restrictions are proposed for the Shoreline Master Program.

Shoreline Access: Shoreline substantial development or conditional uses shall provide public access where any of the following conditions are present:

- The development or use will create increased demand for public access to the shoreline.
- The development or use will interfere with an existing public access way.
- The use is not water dependent.
- The use or development will interfere with use of public lands or waters.
- The river frontage on the site has been identified as location for a trail in the Green River Trail Master Plan.

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Table 2 - Summary of Proposed Shoreline Regulations for the MIC

	River Setback	Other Setback	Height	Landscaping	Imperv. Surface	Public Access	Shore. Stabil.	Over Water
Water Dependent (uses that are dependent upon water location to exist)	None	Zone District	Zone District	Zone District	No Std.	Not Required	Vertical Bulk-heads allowed upland of OHWM	OK if not detrimental to navigation & habitat is restored to a 1:1 ratio
Water Related/ Enjoyment (uses that can't occur economically without a shoreline location or provide substantial opportunity for water enjoyment)	40 feet	Zone District	Zone District	Zone District & 10 feet*** along edge of 40' river environ.,	No net increase in the 40' river environment except mitigated shoreline stabilization.*	Generally required. Habitat Restoration may be substituted.**	Vertical Bulk-heads not allowed. Stab. projects must improve habitat.	No
Non-Water Related	60 feet	Zone District	Zone District	Zone District & 10 feet along edge of 40' river environment.	No net increase in the 40' river environment except mitigated shoreline stabilization.*	Generally required. Habitat Restoration may be substituted.**	Vertical Bulk-heads not allowed. Stab. projects must improve habitat	No
Redevelopment	No setback if redevelopment does not expand horizontally within the river environment.	Zone District	Zone District	Zone District & where possible 10 feet*** along edge of 40' river environment.	No net increase in the 40' river environment except mitigated shoreline stabilization.*	Generally required. Habitat Restoration may be substituted.**	No new vertical bulkhead. Reconstruction ok when it extends no further into river. New stab. projects must improve habitat.	OK if redevelopment stays within the existing over water foot print.

* Some exceptions will apply such as public roads, utility facilities and trails.

**See general standards for situations in which access is and is not required.

*** Half of the 10 feet of landscaping may be located in the river environment.

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An applicant need not provide public access where the site is not on the Green River Trail Master Plan and one or more of the following conditions are present:

- Unavoidable health or safety hazards to the public exist which cannot be prevented by any practical means.
- The project constitutes redevelopment within the river environment and the existing site development does not provide reasonable opportunity for providing access. Figure 2 demonstrates a creative way for providing access with redevelopment.
- The proposed use is water dependent.
- Inherent security requirements of the use cannot be satisfied through the application of alternative design features or other solutions.
- The cost of providing the access, easement or an alternative amenity is unreasonably disproportionate to the total long-term cost of the proposed development.
- Unacceptable environmental harm will result from the public access which cannot be mitigated.
- Significant undue and unavoidable conflict between any access provisions and the proposed use and/or adjacent uses would occur and cannot be mitigated.
- Fish habitat is restored at a ratio of 1 s.f. of restoration to 1 s.f. of required access area.

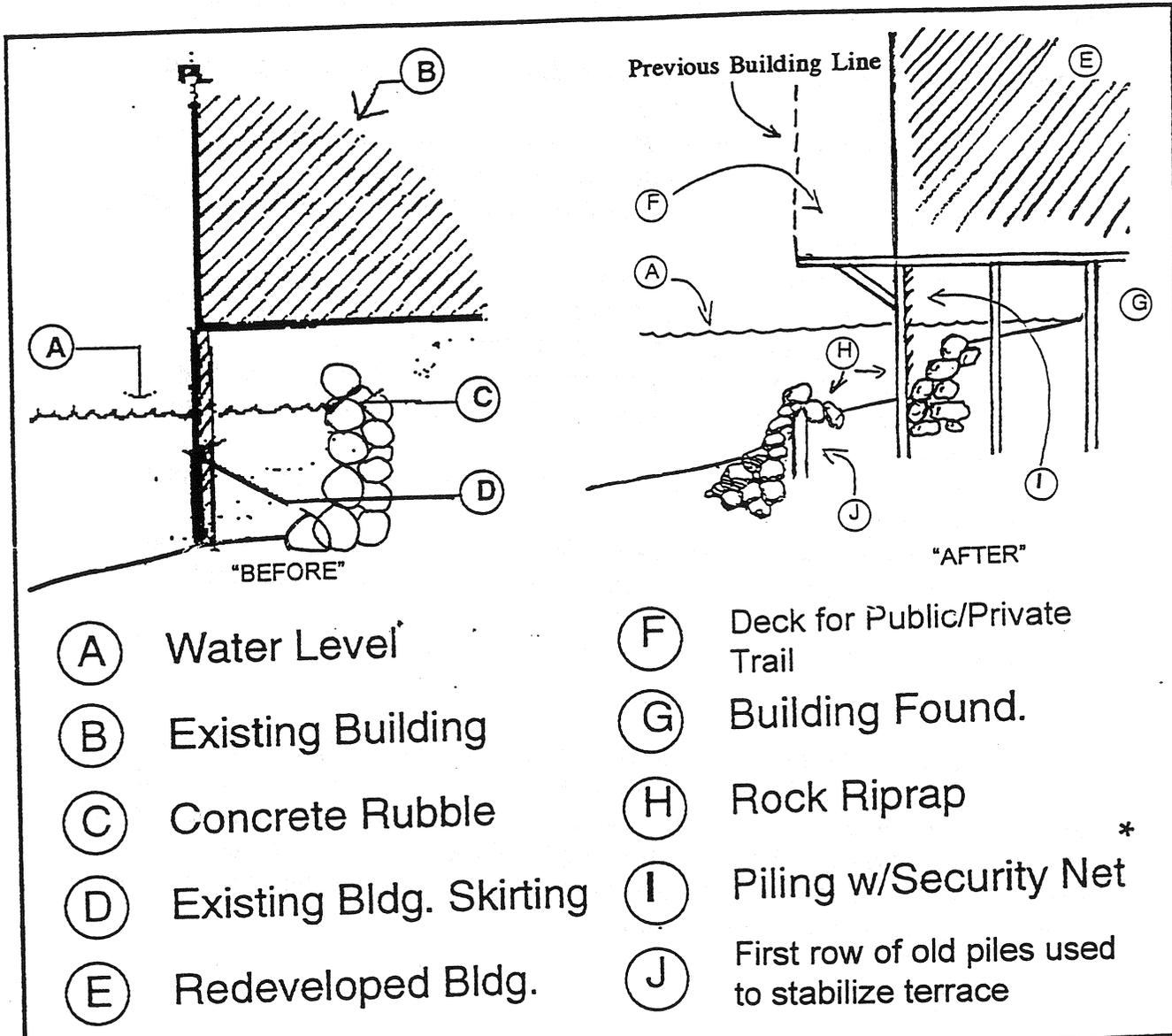
The basic area requirement for access is 16 feet times the length of the river frontage. If the site is not along the Green River trail, access may come in the form of new public access, employee access and amenities, or connections from public areas to the river. If the site is along the Green River trail, either connections to the trail or improved amenities (benches, interpretive signs, water fountains etc.) for public use shall be provided.

Habitat Restoration

Habitat restoration may occur for either for mitigating loss of required access or pervious surface areas or for projects not driven by City requirements. To accomplish this, the City will consider incorporating the concepts of the model ordinance for restoration as prepared by the Duwamish Coalition (Appendix A). Key elements of the model ordinance includes:

- Habitat restoration is voluntary. Property owners may restore habitat either to mitigate loss of habitat or as an alternative to providing public access or for reasons beyond the scope and interest of the city. The quality of the habitat is subject to City approval. Restoration sites are to be located within the salt water wedge.

REDEVELOPMENT OF OVER-WATER BUILDINGS



- (A) Water Level
- (B) Existing Building
- (C) Concrete Rubble
- (D) Existing Bldg. Skirting
- (E) Redeveloped Bldg.
- (F) Deck for Public/Private Trail
- (G) Building Found.
- (H) Rock Riprap
- (I) Piling w/Security Net *
- (J) First row of old piles used to stabilize terrace

FIGURE # 2

Replacement or enhancement of riprap bulkheads beneath existing over-water buildings. Replace wood skirting with wire fencing to allow more sunlight penetration.

* Security skirting should allow passage of wildlife

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- Allows for off-site mitigation within the Lower Duwamish study area. The off-site mitigation may be located beyond the City limits and beyond the shoreline zone, as long as it is within the study area.
- Allows for restoration of streams feeding into the Green/Duwamish River.
- Allows for bank modifications to occur without changing the location of the Ordinary High Water Mark for regulatory purposes (See Figure 3).

Water Dependent Uses

The determination on whether a use is water dependent or not will be based on a narrow construction of the guidelines provided by the State Department of Ecology.

Setbacks - Water dependent uses may locate up to the OHWM to the extent necessary to allow the use to reasonably function.

Over-water Construction - Over-water construction is permitted for water dependent uses provided that navigation will not be adversely affected.

Landscaping - Required landscaping beyond the forty foot zone will be limited to those areas not used by the water dependent portion of the site. For those areas, required landscaping will be based on the classification of the use (water related or non-water dependent). Native vegetation shall comprise a minimum of 30% of the materials in that landscape strip.

Shoreline Stabilization - New shoreline stabilization shall make use of design with least impact on habitat to properly serve the water dependent use. Vertical bulkheads are allowed provided they are not located waterward of the OHWM.

Impervious Surface Area - No new impervious surface area shall be allowed within the river environment unless it serves a water dependent use or results from an improved shoreline stabilization project.

Water Related/ Water Enjoyment Uses

Setbacks - Buildings must be setback 40 feet from the OHWM.

Over-water Construction is prohibited.

Landscaping - A ten foot wide landscaping area shall be provided between the river environment and any buildings and improved site area. Native vegetation shall comprise a minimum of 30% of the materials in that landscape strip.

IMPROVED HABITAT AREAS : A

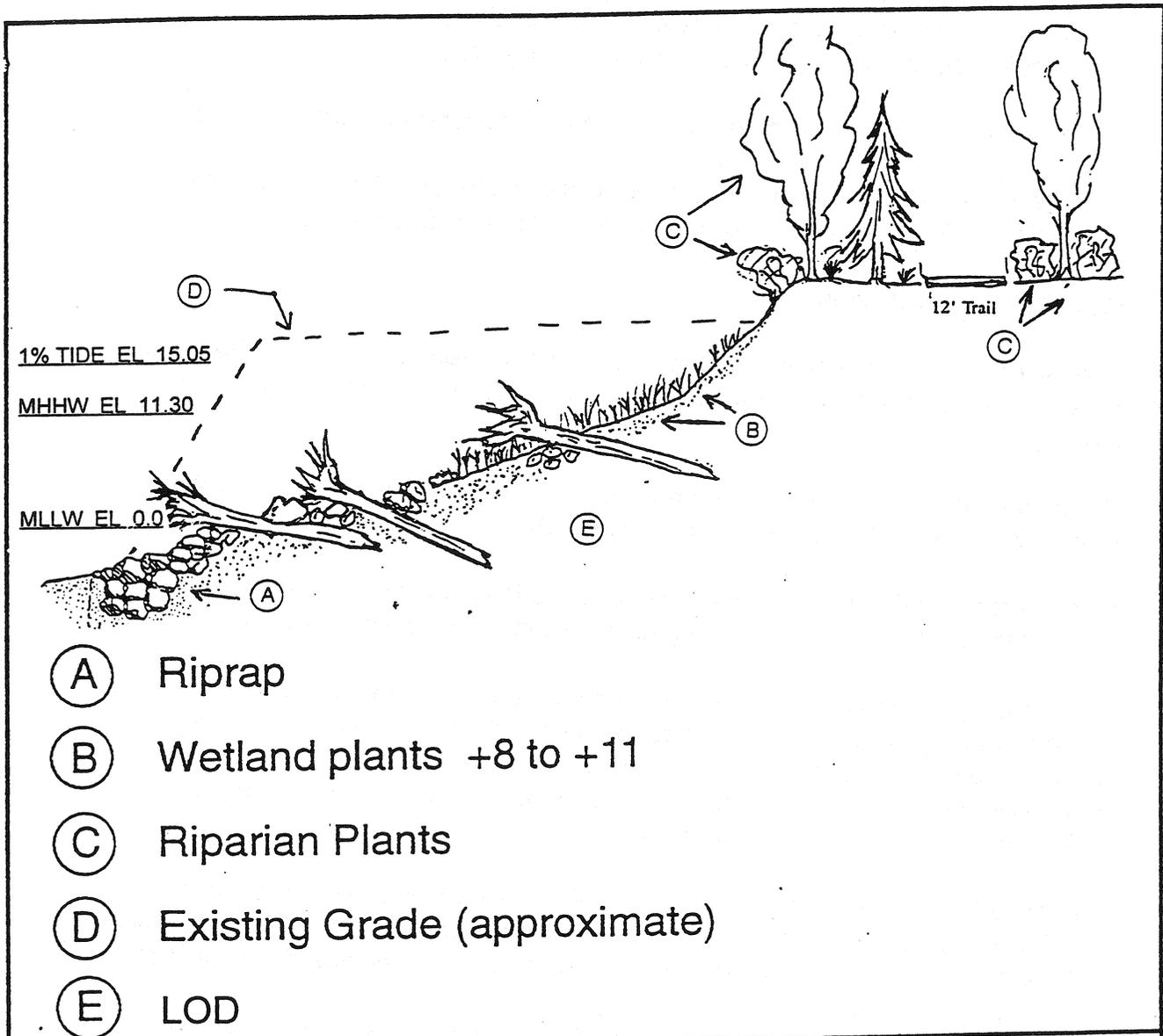


FIGURE # 3

Suitable design for creation of new wetlands/fisheries habitat areas, if desired. Although the location of the O.H.W.M. changes, provisions of the S.M.P. will allow this to occur without changing the location of the regulated shoreline zone.

IMPROVED HABITAT AREAS : B

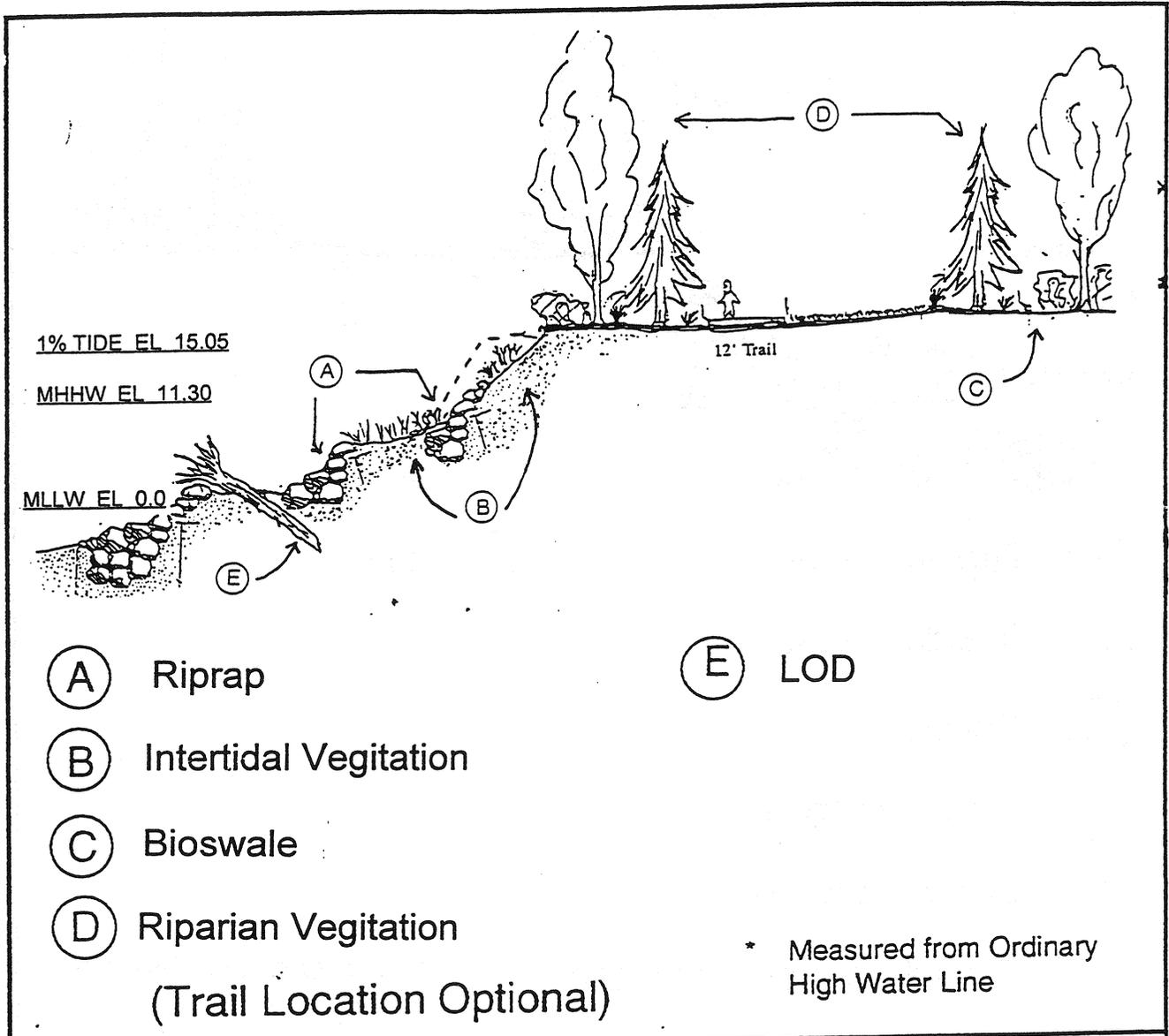


FIGURE # 4

Steps to shoreline. Standard also shows how bio-filtration swales can be incorporated into setback area.

IMPROVED HABITAT AREAS : C

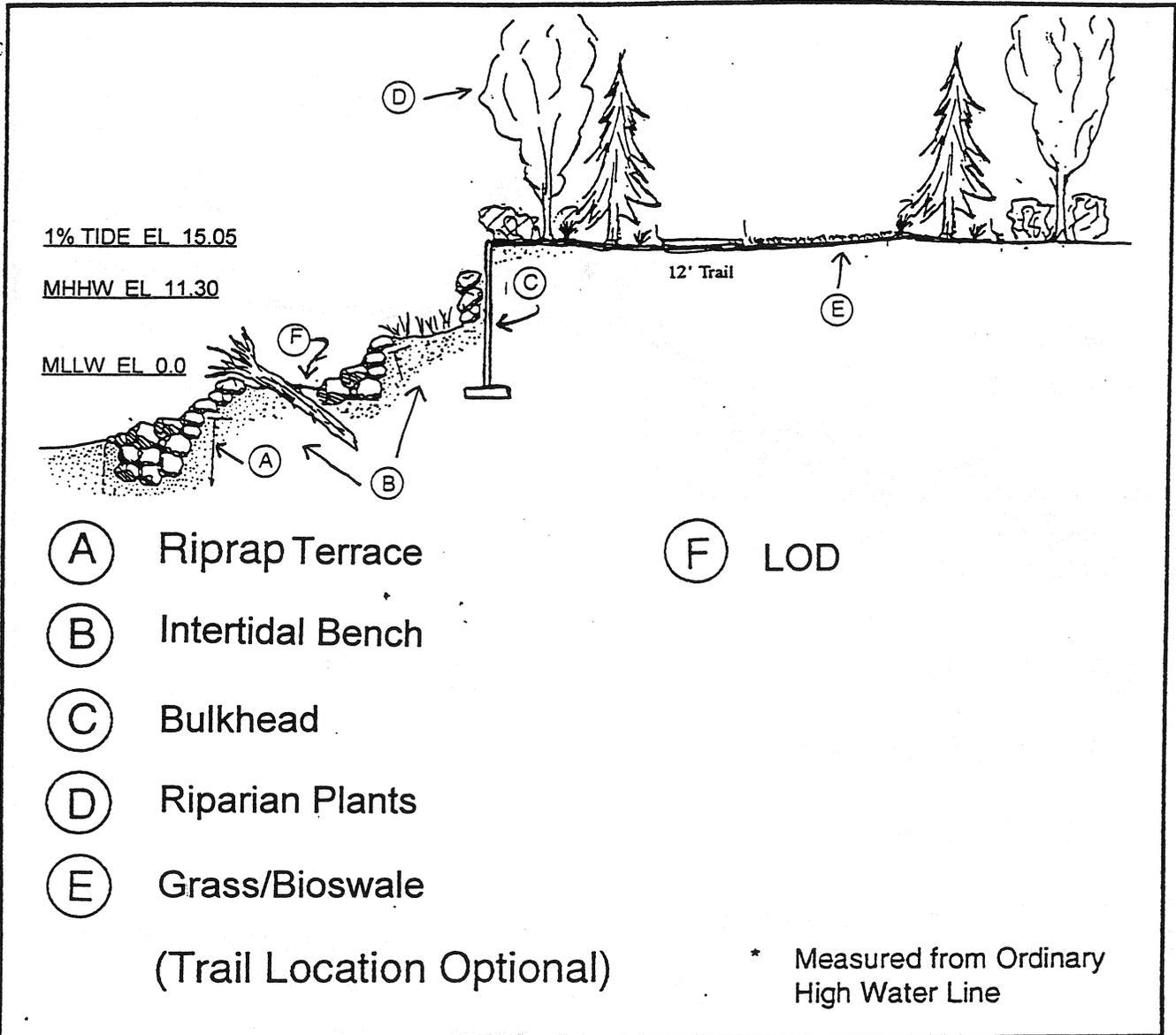
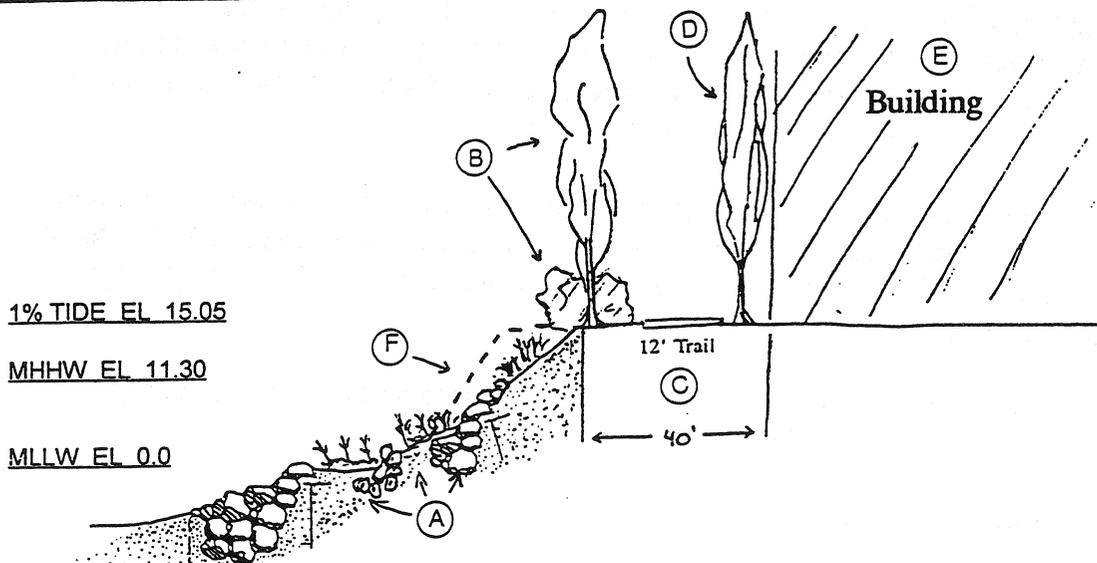


FIGURE # 5

Riprap with vertical bulkhead, swale and landscaping behind.

PROTOTYPE SITE #1



- (A) Riprap with intertidal bench & intertidal plants
- (B) Riparian Plants
- (C) Trail and Fire Lane, if needed
- (D) Trees
- (E) Building
- (F) Existing Grade

* Measured from Ordinary High Water Line

FIGURE # 6

Riprap with riparian vegetation, trail, and landscaping. The additional land needed to improve fisheries habitat and create a more gradual shoreline back slope, should consist of both: excavating the upper slope from dry land area; and filling the submerged area to create the perched beach. An Army Corps of Engineers Section 404 Permit would be required for filling in the submerged areas. The shoreline setback should be measured from the pre-existing shoreline location prior to bank habitat improvements.

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Shoreline Stabilization. New vertical bulkheads are not allowed. Shoreline stabilization shall be allowed provided it improves fish and/or upland habitat through increased areas that become inundated during high water, planting of native vegetation or other techniques recommended by a qualified habitat specialist. Figures 3, 4, 5 and 6 provide a range of alternatives that illustrate desirable characteristics for shoreline stabilization.

Impervious Surface Area - No net loss of impervious surface shall be allowed within the 40 foot river environment unless it is a part of an approved shoreline stabilization project or the lost impervious surface area is mitigated through habitat restoration.

There will be certain exemptions from this standard such as roads, bridges, pedestrian paths and utilities.

Non-Water Related Uses

Setbacks - Buildings serving non-water related or enjoyment uses must be set back a minimum of 60 feet from the OHWM. Parking and other normal site improvements may be located within 50' feet of the OHWM.

Over-water construction is prohibited.

Landscaping - A 10 foot wide landscape strip shall be provided between the river environment and site improvements. Native vegetation shall comprise a minimum of 30% of the materials in that landscape strip.

Shoreline Stabilization. New vertical bulkheads are not allowed. Shoreline stabilization shall be allowed provided it improves fish and/or upland habitat through increased areas that become inundated during high tide, planting of native vegetation or other techniques recommended by a qualified habitat specialist.

Impervious Surface Area - No net loss of impervious surface shall be allowed within the 40 foot river environment unless it is a part of an approved shoreline stabilization project or the lost impervious surface area is mitigated through habitat restoration.

There will be certain exemptions from this standard such as roads, bridges, pedestrian paths and utilities.

Over-Water and Shoreline Zone Redevelopment

Setbacks - Existing buildings and facilities may be reconstructed in their present location. New buildings and site improvements shall be setback based upon

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their classification as either water-dependent, water-related, or non-water related.

Over-water reconstruction is allowed provided the construction is contained within the footprint of the existing building that is being redeveloped.

Landscaping - Where possible, a 10 foot wide landscape strip shall be provided between the river environment and improvements upland from the river environment. Native vegetation shall comprise a minimum of 30% of the materials in that landscape strip.

Shoreline Stabilization - Existing bulkheads may be replaced provided they do not encroach further into the water. Unless necessary for the continued operation of the pre-existing use, any redevelopment of stabilization structures shall be designed to improve fish and upland habitat.

Impervious Surface Area - Redevelopment within the 40 foot river environment shall not result in increased impervious surface area unless mitigated through improved habitat enhancement.

There will be certain exemptions from this standard such as roads, bridges, pedestrian paths and utilities.

**Appendix A -
Duwamish Coalition Model Ordinance for Habitat
Restoration**

[Note: Ideally, the JARPA application form would be revised to add a check-off box for a "local habitat restoration permit." Although this is not essential for the above provision to work, it could make the process more understandable to applicants and reviewers. Also, subsection (3) assumes that Ecology revises the shoreline permit WACs to recognize permits for non-exempt restoration projects where a watershed plan has been adopted by the locality, so that the habitat restoration application/permit serves as the shoreline application/permit. If not, the text can provide that shoreline permit applications be used if the project is located in a shoreline zone; under RCW 36.70B.090, the time period for administrative decisions on Type II/2 permits is the same for shoreline and non-shoreline permits.]

Section 4. Planning and Applying for Approval of Restoration Projects

(1) Restoration projects should be planned following the general steps identified on Figure 2 and the project planning section of the restoration plan. *[list them to ease this cross-reference?]* Where information is available, these steps can be combined into fewer steps. The guidelines appended to the restoration plan may be helpful in planning a project, but are not mandatory.

(2) An application for a habitat restoration permit consists of a JARPA application accompanied by a concise "project analysis."

(3) The project analysis shall include the following information, which may be provided in an order and format determined by the applicant:

(a) the specific restoration objectives of the project;

(b) description of the location, ownership, and existing environmental condition of the restoration project site with respect to those attributes that are relevant to the likelihood of the success of the project, including contamination (off site contamination that could adversely affect the project will be discussed in the analysis required by section 4(4) below);

(c) project description, including if applicable to the project: maps [specify size?] showing before and after ___-foot contours; construction sequence and methods; structures to be demolished or constructed; quantities, quality, and locations of any dredging or filling (including any PSDDA sampling results); erosion control and drainage; planting plans; any mitigation measures; and other principal elements of the project;

(d) description of monitoring and contingency plans, operation and maintenance (if applicable), and project ownership and management after construction or completion; and

(e) studies required by other laws, if any, such as critical area delineations or reports or SEPA documents (see section 4(3) below).

(3) Because plan-level environmental review has been combined or prepared in conjunction with a restoration plan, restoration projects shall be considered subsequent or implementing projects. Proposed restoration projects are not required to adopt the restoration plan/EIS, but should reference and rely upon the plan-level analysis and provide supplemental project-level information as needed. SEPA compliance for restoration projects that are not categorically-exempt under WAC 197-11-305 and 800 [cite city/county code reference] may be provided through any of several methods, including but not limited to an addendum, environmental

checklist, or other combined SEPA/project review document allowed under the SEPA procedures.

(4) The project analysis shall concisely discuss how the project is consistent with the Restoration Plan by stating the following (in not more than a few total pages at most; cross-references may be made to other technical or environmental analyses that may have been prepared):

(a) how the proposed project fits within or promotes the restoration plan concept (section __ of the Restoration Plan);

(b) how the applicable site criteria relate to the proposed project (section __ of the Restoration Plan), including the functional habitat values that the proposed project provides to the watershed (and the comparison with the loss of any functional habitat values as a result of the restoration project or other combined project elements)

(c) how the project includes adaptive management and stewardship, including how the habitat will be established or protected in perpetuity (see general guidelines in Appendix __ of the Restoration Plan).

(5) If comments are received on the project analysis through the project review process, the city/county may revise or request the applicant to revise the analysis prior to making the permit decision. The analysis in subsection 4(4) shall be considered to serve as the analysis of habitat (plants and animals) and the other elements of the natural environment and of environmental health and land and shoreline use that may be required for the local project review process, including SMA, GMA and SEPA. Although construction of restoration projects must comply with applicable codes and development standards, no further analysis of land use or shoreline consistency shall be required in order for the city/county to make a decision on a habitat restoration project.

(6) Each habitat restoration permit shall specify the following:

(a) the permittee, location, and description of the project (which may be incorporated by reference from other documents) including objectives by which to measure project success and provision for adaptive management and stewardship ;

(b) the time period for implementing the project, if any;

(c) mitigation measures, if any, other than compliance with existing codes and laws;

and

(d) particulars of project elements, if any, which have been deferred to subsequent permitting agencies.

Section 5. Development Standards for Restoration Projects

(1) Consistency with Restoration Plan. Restoration projects shall be consistent with the Restoration Plan, including the siting criteria, recognizing that some flexibility is appropriate since

the plan is intended to be refined and interpreted by actual experience gained with projects [note: this is the same standard currently required of and applied to shoreline permits and SMPs, and to land use permits and GMA development regs/comp plans]. The permit decision may incorporate the analysis required by subsection 4(4) by reference, and additional documentation of consistency with the Restoration Plan is not required.

(2) Buffers. The city/county director of [title] shall establish buffers, if any, on a case-by-case basis. Any buffers that are needed for the success of the restoration project shall be incorporated into the project design (buffers may or may not be appropriate for a habitat restoration project, as a project typically serves as a buffer or transition between aquatic and upland uses).

(a) Notwithstanding the city/county critical area ordinance or any other provision of city/county code, no buffer shall be required of a habitat restoration project except as specified in the habitat restoration permit.

(b) If a restoration project creates a new wetland or other feature that may in turn result in a current or future buffer requirement under another provision of the city/county code, no such buffer shall be required (except as may be specified as part of the habitat project design).

(c) A habitat restoration permit may be amended to include additional setbacks or buffers only if the project's adaptive management (monitoring or contingency planning) demonstrates that an additional setback or buffer is necessary for the success of the restoration project.

(3) Conflicting Development Regulations. Inasmuch as the Restoration Plan has been adopted as part of the city/county comprehensive plan and shoreline management master program, and development regulations are required to be conform with adopted plans: to the extent that a specific shoreline use regulation, critical area regulation, or other land use code provision does not authorize or would prevent the implementation of a habitat restoration project that the city/county otherwise determines would be consistent with the Restoration Plan, the city/county director of [title] may determine the conflicting requirement is not applicable to the habitat restoration project or may specify an alternative requirement that would allow the restoration project to proceed.

(4) On and Off Site/Like Kind Projects. (a) By providing a landscape ecology watershed restoration concept (including the identification of types of habitats, habitat focus areas, and functional values that need to be restored in the lower watershed), the Restoration Plan provides a basis for proposing, evaluating, and making decisions on proposals for restoration projects that may occur on sites not owned by applicants, or to mitigate impacts that may occur on a site other than the site of the proposed restoration project.

(b) Depending on the purpose of the restoration project and whether there are limitations in other state or federal laws, the city/county may approve restoration projects that are consistent with the Restoration Plan and provide critical or important habitat of a different habitat

type than previously existed on or off site. The main criterion is the functional habitat value that the project contributes to the watershed.

(c) Nothing in this chapter affects the hierarchy of mitigation measures that may apply to a project under other state or federal laws, including guidelines relating to avoidance of impacts prior to consideration of restoration or compensatory mitigation (42 USC ___/404(b)(1) guidelines).

(d) Nothing in this chapter affects existing governmental authority to require, approve, or agree to mitigation projects outside of the lower watershed and adjacent transition areas. Although it is the intent of the Restoration Plan to focus habitat restoration efforts in the lower watershed, including projects that may be proposed to mitigate habitat losses from development activities in the lower watershed, the plan recognizes the need for flexibility and the interrelationship between the health of the lower and upper watersheds.

(5) Future Credit. (a) If a restoration project is proposed which is not providing mitigation for loss of habitat as a result of other project activities, and the applicant wishes to obtain credit toward future habitat obligations (if any should arise), the applicant may request that the permit decision include such a credit. Any such credit shall be identified for public and agency review in the project review process and specified in the habitat restoration permit. The permit shall state that the credit is available only if applicable laws (including any obligation to avoid impacts on habitat) have been met with regard to the future project, prior to using the credit.

(b) If a restoration project is proposed that provides greater functional habitat value consistent with the Restoration Plan than would be required by law to address the impacts of a development or other project, the applicant may request that the permit decision include credit toward future habitat obligations if any should arise. If the city/county determines that the impacts could not reasonably have been avoided, the city/county shall specify the extent of additional habitat and functional values (or the monetary sum of providing such habitat) proposed as a credit toward potential future obligations. If, after public and agency comment through the project review process, the city/county determines a credit is appropriate, it shall specify the nature of the credit in the habitat restoration permit.

(c) If the applicant wishes to request credit from any governmental entity other than the city/county, the city/county will help the applicant if requested to determine the feasibility of or assist in developing an interagency memorandum of agreement or other method to document the credit. City/county staff time shall be charged to the applicant at the same hourly rate as is charged for permit processing.

(d) In determining whether to provide future credit under this section, the city/county shall base its decision primarily on three factors: (i) the restoration project promotes the Restoration Plan and in particular its landscape ecology approach; (ii) the habitat restoration for which credit would be given will not encourage the loss of existing habitat in the watershed by the

applicant or others; and (iii) to the extent possible, the credit shall be based on functional values to the watershed ecosystem, rather than on acreage or similar arbitrary measures.

Terms to be defined (depends on existing codes)?

"Applicant" means

"Cleanup" means

"Combined project" means a project that includes a habitat restoration/mitigation component

"Critical area" means

"Critical area permit" means (permit or other form of approval)

"Development standards" means

"GMA" means

"Habitat restoration permit" means

"JARPA" means

"Local land use permits" means

"Lower watershed habitat plan" means Lower Duwamish Watershed Habitat Restoration Plan

"Mitigation" means

"Permit" means/includes approvals eg. DNR leases, Ecology/EPA cleanup decisions, etc.

"Project permit application" means/includes requests for approvals (not necessarily application in the strict sense) as defined by RCW 36.70B.020(4)

"Project" /public or private/enhancement, cleanup, development, etc.

"Project review" or "project review process" means

"Restoration project" means

"Shoreline permit" means

"SMP" means

Related code revisions

corresponding SMP and CAO revisions (water-dependent use, habitat restoration use, recognize habitat restoration permit, etc.)

The following provisions can be considered in the ordinance development process to supplement the above sections of the ordinance. They may be useful for applicants, citizens, and agency reviewers people who are not familiar with restoration project planning and permitting:

Section 2. Applicability

(5) The local and state adoption of the Lower Duwamish Watershed Habitat Restoration Plan as part of the city/county shoreline master program and GMA local comprehensive plan, state coastal zone management program, and Puget Sound Water Quality Management Plan is intended to produce consistency in the review by all levels of government of applications for restoration projects. There may be some differences among agencies in the interpretation of the plan or in specific regulatory standards that need to be addressed, as well as opportunities for efficiency and coordination in permit processing. Applicants are encouraged to identify and consult with governmental entities and interested members of the public early in project planning and prior to submitting applications for restoration projects.

Section 3. Permit Process Options.

(4) Applications for habitat restoration projects may be filed under this chapter or through other applicable city/county permit processes, as follows:

(a) If a habitat restoration project application is filed under this chapter, the application shall serve as the project permit application for purposes of any local land use permits that may be required for the project, including but not limited to shoreline, critical area, and grading permits; except that final construction permits for the project may be required under the building code (utility, electrical, plumbing, and similar permits). No additional land use or shoreline permit application to the city/county for the restoration project shall be required.

(b) If a city/county permit or approval for the restoration project is filed under another provision of the city/county code, a separate permit is not required under this chapter. The applicant is encouraged, but not required, to note on the permit application that the project is (or includes) a "Lower Duwamish Watershed restoration project." This will serve to notify the city/county, other agencies and the public that the incentives in section 5 of this chapter apply to the proposed project.

(5) If the application for a restoration project includes other project elements, such as requests for cleanup or development approvals, the applicant may:

(a) use other applicable permit processes, such as a shoreline substantial development permit application, to process the restoration project element and other project elements;

(b) file and consolidate the processing of a permit application under this chapter for the proposed restoration project element with any other applications to the city/county; or

(c) file and separately process an application under this chapter for the proposed restoration project element, provided that the city/county concludes that environmental review has

been conducted on the overall proposal or has been properly phased, as required by WAC 197-11-060 and section __ of the city/county code.

(6) If it is not clear whether the city/county code otherwise provides for the processing of a permit application for a restoration project, an applicant may submit an application to the city/county under this chapter [necessary?]

Section 4. Planning and Applying for Approval of Restoration Projects

(4) *[Most people are unfamiliar with regulatory reform options that already exist; by providing specific authorized examples, environmental (SEPA) aspects of project review will likely be faster and simpler than is typically the case, without loss of substantive information]*
SEPA compliance for restoration projects that are not categorically-exempt under WAC 197-11-305 and 800 [cite city/county code reference] may be provided through any of several methods, including but not limited to the following:

(a) adding the title "SEPA addendum" to the project analysis and simply providing information on environmental impacts and mitigation measures within the text of the project description and analysis (if the restoration project would not cause probable significant adverse environmental impacts);

(b) adding the title "SEPA addendum" to the project analysis and including an environmental summary (see WAC 197-11-235), separate chapter, or appendix providing information on environmental impacts and mitigation measures (if the restoration project would not cause probable significant adverse environmental impacts);

(c) completing and attaching an environmental checklist to the project analysis (if the restoration project would not cause probable significant adverse environmental impacts);

(d) any of the above if habitat restoration projects are designated as planned actions in a city/county planned action ordinance (in which case a threshold determination need not be made);

(e) preparing a supplemental EIS if the restoration project would cause a probable significant adverse impact; or

(f) attaching the project analysis to (or combining it with) an environmental checklist, EIS, or other SEPA document that may be prepared on a proposal that include both habitat restoration and other project elements.

Appendix B-2
MIC Shoreline Impact Analysis

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I. Introduction

The intent of this document is to evaluate the current draft of the proposed SMP. The materials received from the DCD for the purpose of impact analysis have been reviewed. The following recommendations for improvements to the draft of the SMP are provided herein and purposely re-orient the policies within the draft to reflect a more significant improvement to the conservation, restoration, and mitigation policies concerning the riverine and terrestrial habitats throughout the Duwamish MIC.

II. Background on the Duwamish System.

The document authored by Curtis D. Tanner, produced for the Port of Seattle and the EPA, entitled; Potential Intertidal Habitat Restoration Sites in the Duwamish River Estuary clearly illustrates historical condition of the Duwamish river system prior to the industrialization within this locality. In short, the general riverine area prior to 150 years ago, encompassed a tremendous amount of productive wetland habitat, and most likely had a complex and ecologically diverse biotic community.

During the development and industrialization of the lower Duwamish over the last 150 years, a significant percentage of riverine habitat has been lost. Partially because of developmental practices, but primarily because of a fundamental lack of understanding as to the importance and value of riverine habitat.

Within the last several decades, scientific research has uncovered the importance of riverine habitats and their value to the species that utilize them. Increased awareness as to the significance of these habitats has lead to many rehabilitation strategies and riverine restoration projects.

III. Evaluation of the proposed SMP

The current draft of the proposed SMP is well thought out. However, recommendations for each of the itemized articles are listed beginning with the goals and policies section (page 19 of the document submitted for review). The purpose of the review comments is to re-orient the SMP to include a greater degree of existing habitat preservation while also increasing the quantity of rehabilitated and/or mitigated wildlife habitat required for future waterway developments.

The following comments are specific to each line article:

Goals:

1.5: Does not address wildlife habitat.

5.2: Should be more specific as to the value of shoreline habitat.

- 5.3: Does not address wildlife habitat, and should explain what is meant by long term benefits of the river.
- 5.4: To the extent that wildlife habitat is also protected, and or managed.
- 5.5: While also enhancing the public awareness of riverine wildlife habitat and the importance of it's protection and preservation.
- 5.6: To the extent that these activities will not compromise habitat rehabilitation efforts while also providing public awareness of the shoreline ecosystem.
- 5.7: To the extent that these activities will not compromise habitat rehabilitation efforts while also providing public awareness of the shoreline ecosystem.
- 5.8: To include emphasis on wildlife habitat.
- 5.9: With emphasis on the preservation of the areas, to include areas of limited or restricted public access, either during seasonal breeding or nesting activities.
- 5.10: How are the control programs going to achieve this goal?
- 5.11: With the exception that where rehabilitated habitat sites do endanger public safety, proper restriction of public access be employed.

Policies:

- 1.5.1: While also addressing shoreline wildlife habitat considerations and appropriate preservation of these habitats.
- 1.5.2: Yes, public awareness is key to the success and sustainability of existing and rehabilitated wildlife habitat.
- 1.5.3: Welcome donated art but reserve \$ for riverine habitat restoration.
- 1.5.4: In what way? Isn't this addressed in 1.5.1?
- 1.5.5: How is this going to be accomplished? Monitored?

Shoreline Planning and Management:

5.2.1: Okay.

5.2.2: Okay.

Land Development Uses and Economic Vitality

5.3.1: ...and to include aquatic and riparian habitat restoration guidelines.

5.3.2: Yes.

5.3.3: ...or provides any benefit to the conservation of wildlife and wildlife habitat.

5.3.4: Yes.

5.3.5: Yes.

5.3.6: Yes.

MIC Development Policies

5.3.9: ...and ensures either preservation and/or restoration of wildlife habitat along the shoreline zone.

5.3.10: Okay.

Private Property Rights

5.4.1: ...so long as such alteration does not impact wildlife habitat.

5.4.2: ...so long as such alteration does not impact wildlife habitat.

5.4.3: With the exception that private land altering does not impact the existing or restored wildlife habitat along the shoreline zone.

5.4.4: Okay.

River Design Quality

5.5.2: ... Provides wildlife habitat protection and conservation measures to either restore or mitigate for lost wildlife habitat within the shoreline zone.

Access and Recreational Use

5.6.1: Okay.

5.6.2 - 5.6.4: To the extent that these activities address wildlife habitat conservation for resident and migratory species within the MIC.

Policy for Development in MIC

5.6.9: to the extent that a trail system will not impact the current or future of wildlife habitat throughout the MIC route.

5.6.10: ...public restrooms, and waste disposal.

5.6.11: ...while also protecting the potential of rehabilitated wildlife habitat within these areas.

Transportation within the Shoreline

5.7.1: ...with emphasis on wildlife habitat conservation.

5.7.2: Okay.

5.7.3: ... and provide monitoring to discover and/or mitigate for any adverse effects or conditions on usage of wildlife habitat.

5.7.4: Okay.

Historical Resource Use

5.8.1: Okay

5.8.2: ...to the extent that the surrounding wildlife habitat is protected and or improved.

Natural Environment and Habitat Use

5.9.1: Okay

5.9.2: Okay

5.9.3: ... at a minimum of 2:1 replacement ratio.

Water Quality, Surface Water, and Flood Control Use

5.10.1 - 5.10.3: Okay

Public Health, Safety and Welfare

5.11.1: Okay.

Manufacturing and Industrial Center - Protect the Land Resource

11.1.7: Okay.

11.1.8: ...to the extent that wildlife habitat areas are not compromised.

IV. Recommendations for SMP Document

The itemized comments made on the policies of the SMP should be reviewed and placed into the overall intent of the SMP. If wildlife along the MIC is to have any potential increase in species diversity, population, and usage, the suggested items should be included within the final revision.

V. Cumulative Impacts

It is difficult to project the cumulative impacts of future development along the Duwamish shoreline corridor without knowing what specifically is planned for development, i.e., where is the development located, to what extent development will disrupt the current condition of the shoreline, what type of use classification is the development, etc.. However, the cumulative riverine habitat impacts from the construction of new or re-developed water dependent use facilities should have minimal impact under the new policies set forth in the revised SMP. These revised policies provide for riverine habitat restoration, mitigation, and/or enhancement to the extent that on-site habitat improvements are possible, and where off-site mitigation is necessary.

New water dependent use development within the Duwamish MIC should be conducted to provide local ecological habitat enhancements to the extent possible. Off-site habitat mitigation must also be carried out and should provide for replacement of riverine habitat at a minimum of a 2:1 ratio. Mitigation site selection and restoration criteria should be based on the potential of the development site to act as natural riverine environment and the inherent ecological value to the likely user species within the localized estuary. Mitigation restoration of areas outside the MIC is possible as long as off site restorations benefit and are inclusive of the same species group displaced by the water dependent development.

The re-development of existing water related use structures within the MIC, should include but not be limited to localized riverine habitat improvements to the extent possible by following the design regulation policies set forth within the revised SMP.

The revised shoreline development policies within the updated SMP, will provide comprehensive guidelines for biological conservation and habitat restoration/mitigation for the localized ecology within the Duwamish MIC.

VI. Evaluation of Two Prototype Shoreline Developments Along the MIC.

A. Prototype development site #1.

From the submitted material related to prototype site #1 (Figure 1A and 1B), the building illustration would appear to conform to the proposed SMP guidelines, however there would appear to be one major deviation from the SMP. The illustration of prototype site #1 shows that the building is apparently closer than the required 60' non-water related set back. In addition, the provided illustrations detailing the bank stabilization for this site design rely too heavily on a solid bank of riprap, and provide little in the way of terraced area or intertidal mud habitat. There is also a lack of significant riverside vegetation. The revised illustration submitted for consideration provides improved intertidal habitat by terracing the bank while also including a significant increase in riparian vegetation.

The rework of the existing river bank grade will further reduce the limited area of building set back but provide a slight increase in the water capacity of the river through this section. In addition, an increase in riverine vegetation may also offset the reduced set back. However, preferably the building should be set back to at least the minimum distance from the MHHW line, or provide off-site mitigation. The trail through this area should be set back from the river bank as to allow for riparian vegetation planting and growth as shown in Figure 1C.

B. Prototype Development site #3

The building illustration (Figure 2A) does not appear to further impact the site. The illustration showing the proposed alteration of the river bank profile (Figure 2B) relies too heavily on a solid riprap bank. To improve the proposed bank modification the bank should be terraced as shown in Figure 2C.. Terracing will provide intertidal areas of different depths as well as promote an increase in species usage due to the enhanced river bank characteristics. The security netting should be altered to allow for an increased in light penetration as well as provide improved passage for aquatic species..

C. Proposed Bank Profile Illustrations

Each of these illustrations (Figures 3A, 4A, & 5A), have been modified from the submitted illustration to provide an increase in intertidal habitat (Figures 3B, 4B, & 5B). Primarily the river banks should be terraced. A solid riprap embankment does not provide quality aquatic habitat. Large organic debris (LOD), should also be included in the bank stabilization work. This natural material is important to many invertebrate species and may tend to create micro habitat areas. In addition, the trail system should be set back from the edge of the riverbank. These areas should be used to plant and encourage riparian and other forms of riverine vegetation. The trail network could have pull outs or areas along the bank with benches and the like, but the primary trail should not be placed in areas better suited for the restoration of riverine vegetation.

D. Public Access Connections to the Shoreline

This illustration (Figure 6), looks good with the exception that the view points should include interpretive signage, and that the trail system not run right along the edge of the river bank. There should be some set back to allow for riparian and associated vegetation to be planted.

VII. Recommended Implementation Actions

General topics for inclusion into the revised policies of the SMP should be inclusive of but not be limited to the following items:

A. Public Access to the River

Public access to the Duwamish in and outside of the MIC is important for the community. Public river access provides an opportunity to increase community awareness, environmental education, and provides opportunity for recreational activities. The proposed trail system that parallels the river can satisfy many of the general public river access needs and serve the community in several ways. Interpretive signs that describe historical and ecological subjects, and picnic or rest areas should be incorporated into the trail design. Interpretive signs placed at trail rest areas could describe specific ecological habitats within the presented field of view. Information on these signs could include the reasons for the importance of riverine habitat conservation and illustrate examples of the plant and animal species that may be found using the given area. These signs could also explain why riverine habitat is important, and how preserving and protecting these areas increase the ecological value of the entire riverine system. Trail turn outs like the one illustrated in Figure 1 should provide near river public access that would satisfy the policies outlined in the revised SMP.

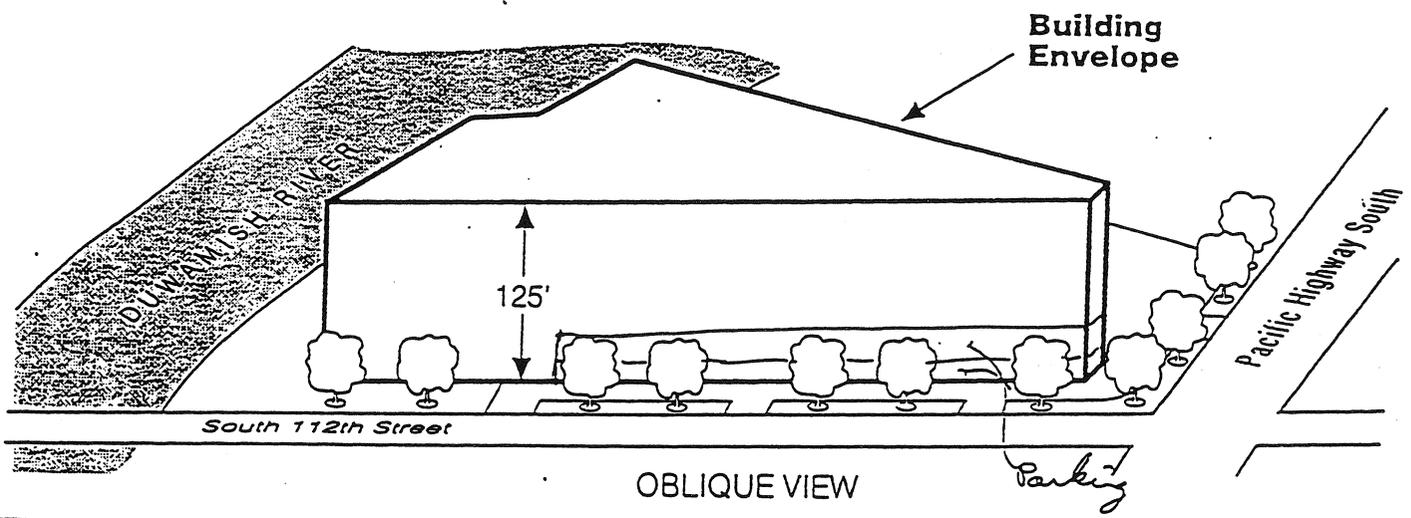
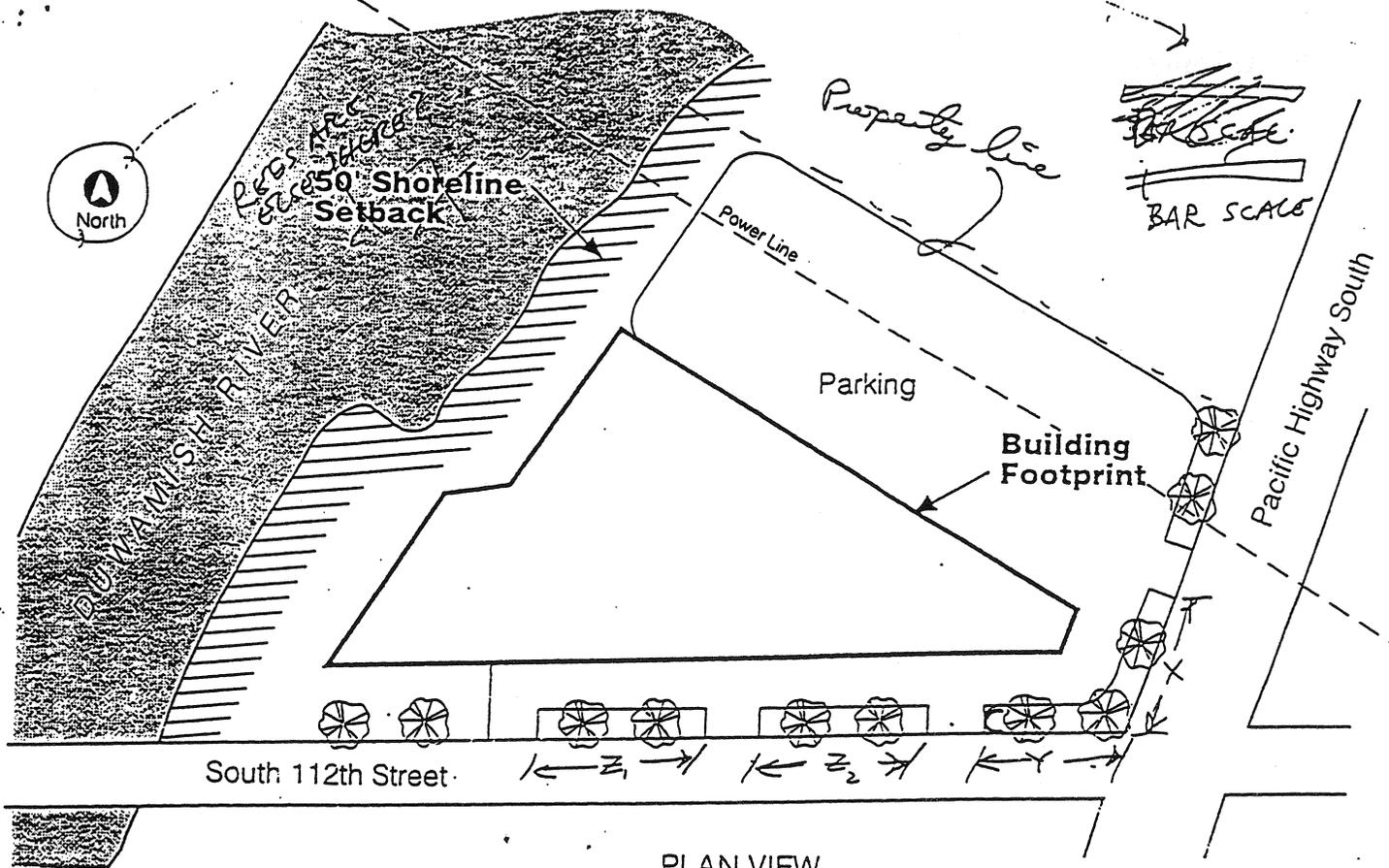
B. Definition of Long Term Benefits to the River

Long term benefits to the river should provide for the protection, preservation, and conservation of wildlife habitat into perpetuity to the extent of the regulatory policies described by the SMP will do so. These benefits should include mitigation standards for re-created habitat and species displacement. This should also include specific provisions for the monitoring and improvement of water quality based upon EPA standards and/or DOE regulations. Mitigation projects should have a habitat replacement ratio of not less than 2:1 and should be restricted (where applicable) to observation use only by the general public. Limitation of the public access from selected preserve areas should include locations by which the public could have observatory use. Observation areas should include interpretive signage and be designed to keep preserved or restored wildlife habitats from indiscriminate human disruption or interference.

VIII. Conclusion

The modified SMP should provide essential habitat restoration and preservation policies throughout the Duwamish MIC. Overall, the proposed policies including the wildlife habitat concerns should guide future development within the MIC in an ecologically conscious framework. Implementation of the revised and updated portions under this plan should significantly improve the value and quality of wildlife habitat throughout the Duwamish shoreline corridor.

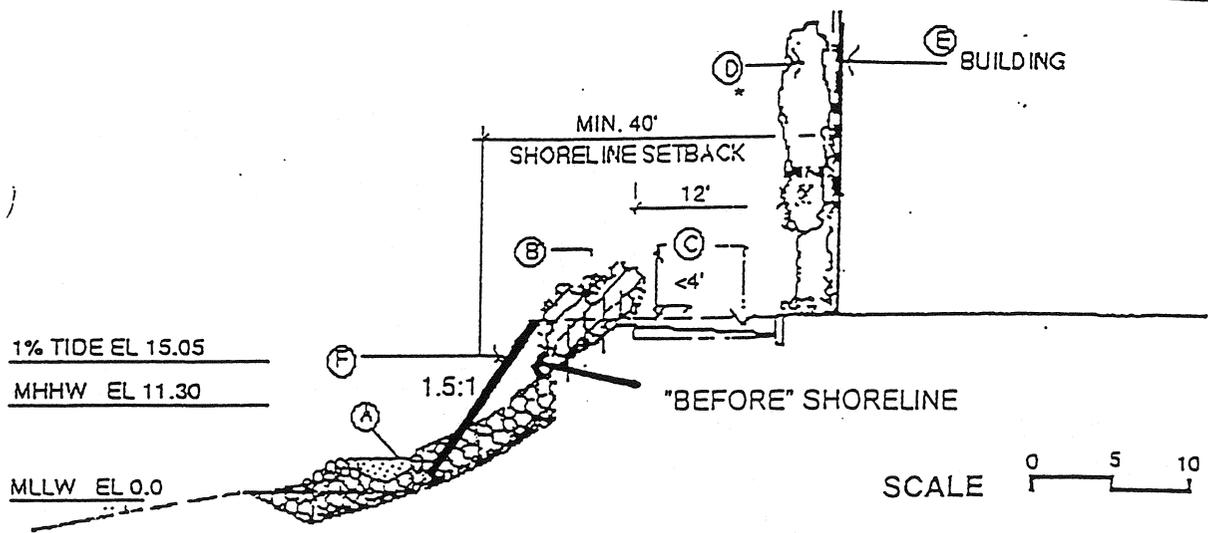
IX. Appendix



SITE DATA:

Zoning: MIC/H	Building Height: 125'	Parking Required: 437 Spaces
Site Size: 475,000 SF	Site Coverage: 100%	(@ 2.5/1,000)
Building Footprint: 175,000 SF	Driveways: Number 4 (WIDTH?)	Parking Proposed: 525 Spaces
Building Uses: Office 35,000 SF	Lin. Ft. of	(@ 3.0/1,000)
R&D 70,000 SF	Curb Cuts 100	
Lab 70,000 SF		

Figure 1A. Prototype development site #1.



- (A) Riprap with intertidal bench
- (B) Riparian Plants
- (C) Trail and Fire Lane, if needed
- (D) Trees (Optional)
- (E) Building
- (F) Existing Grade

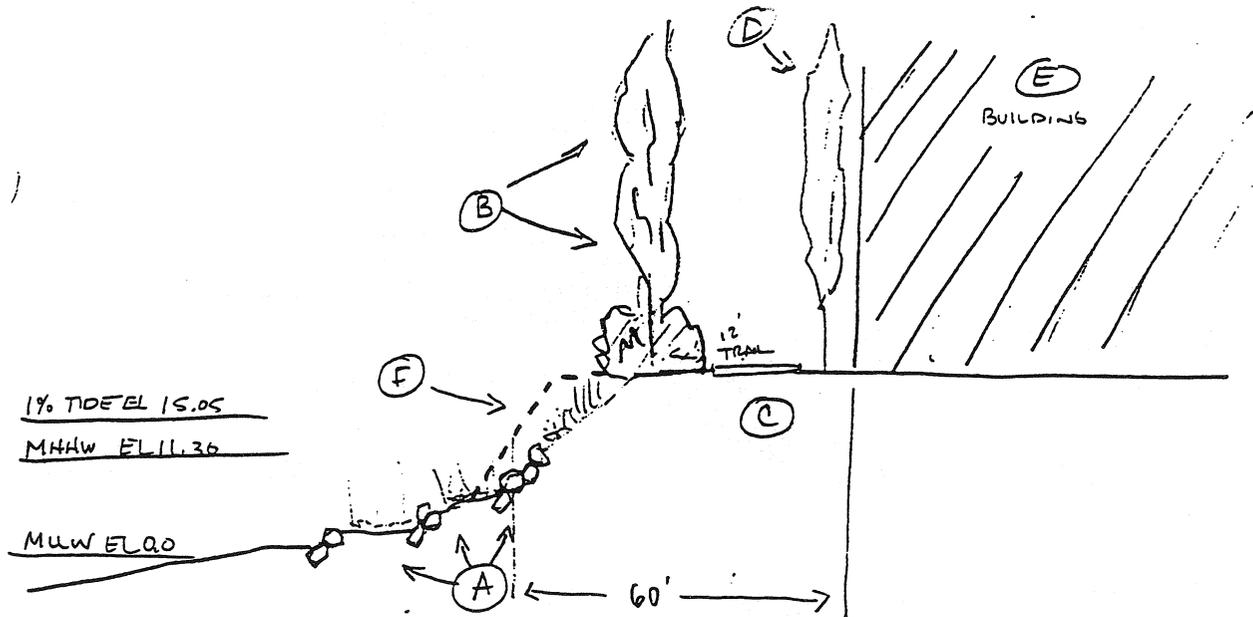
* Measured from Ordinary High Water Line

FIGURE # ____

Riprap with riparian vegetation, trail, and landscaping. The additional land needed to improve fisheries habitat and create a more gradual shoreline back slope, should consist of both: excavating the upper slope from dry land area; and filling the submerged area to create the perched beach. An Army Corps of Engineers Section 404 Permit would be required for filling in the submerged areas. The shoreline setback should be measured from the pre-existing shoreline location prior to bank improvements.

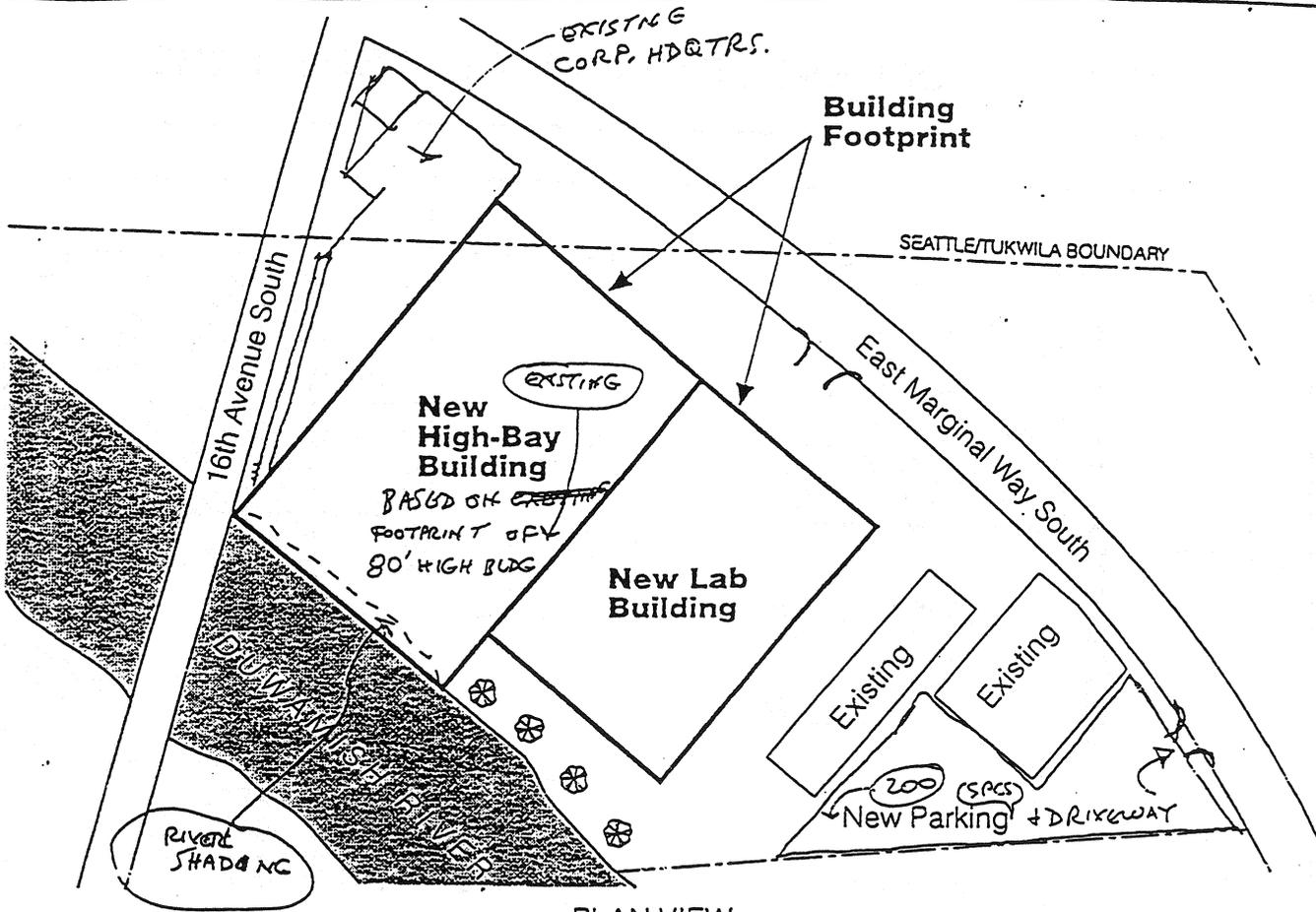
SOURCE: Boeing Duwamish Corridor Redevelopment

Figure 1B. Prototype development site #1.

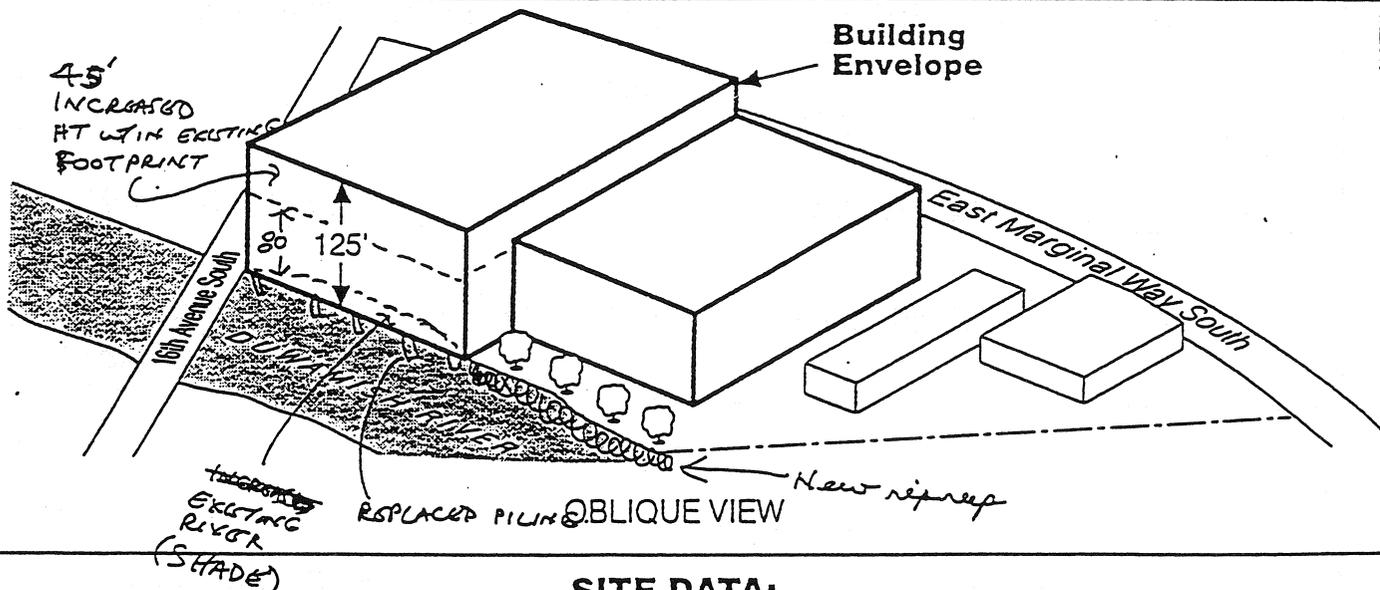


- (A) TERRACED RIPRAP WITH INTENTIONAL BENCHES & INTENTIONAL PLANTS
- (B) RIPARIAN PLANTS
- (C) TRAIL & FIRE LANE
- (D) TREES (~~OPTIONAL~~) (THIS LOCATION MAY NOT PROVIDE A SUFFICIENT SLOPING ANGLE FOR THE TREES)
- (E) BUILDING
- (F) EXISTING GRADE

Figure 1C. Prototype development site #1.



PLAN VIEW



SITE DATA:

Zoning:.....MIC/H	Building Height: 125'	Parking Required: 1,450 Spaces
Site Size: 50 Acres	Site Coverage: 100%	(@ 1/1,000)
Building Footprint: 1,450,000 SF	Driveways: Existing + 1 1 for NEW PARKING AREA	Parking Proposed: ^{EX = 400 (PER COUNTY)} NEW = 200
Building Uses: Highbay Mfg.: 750,000 SF		On-Site: 600
Laboratory: 700,000 SF		Off-Site: 900+

Figure 2A. Prototype re-development site #3.

REDEVELOPMENT OF OVER-WATER BUILDINGS

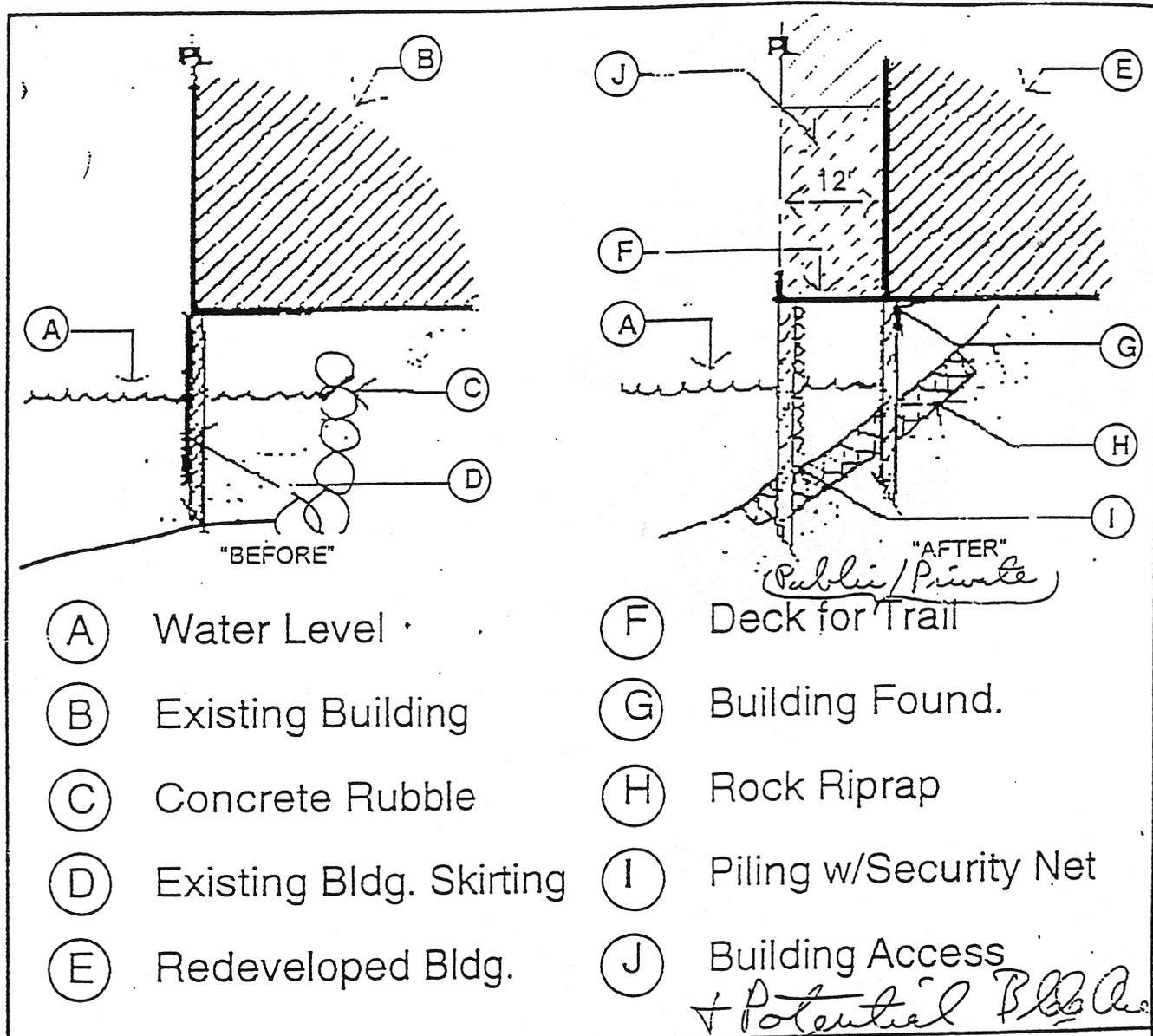
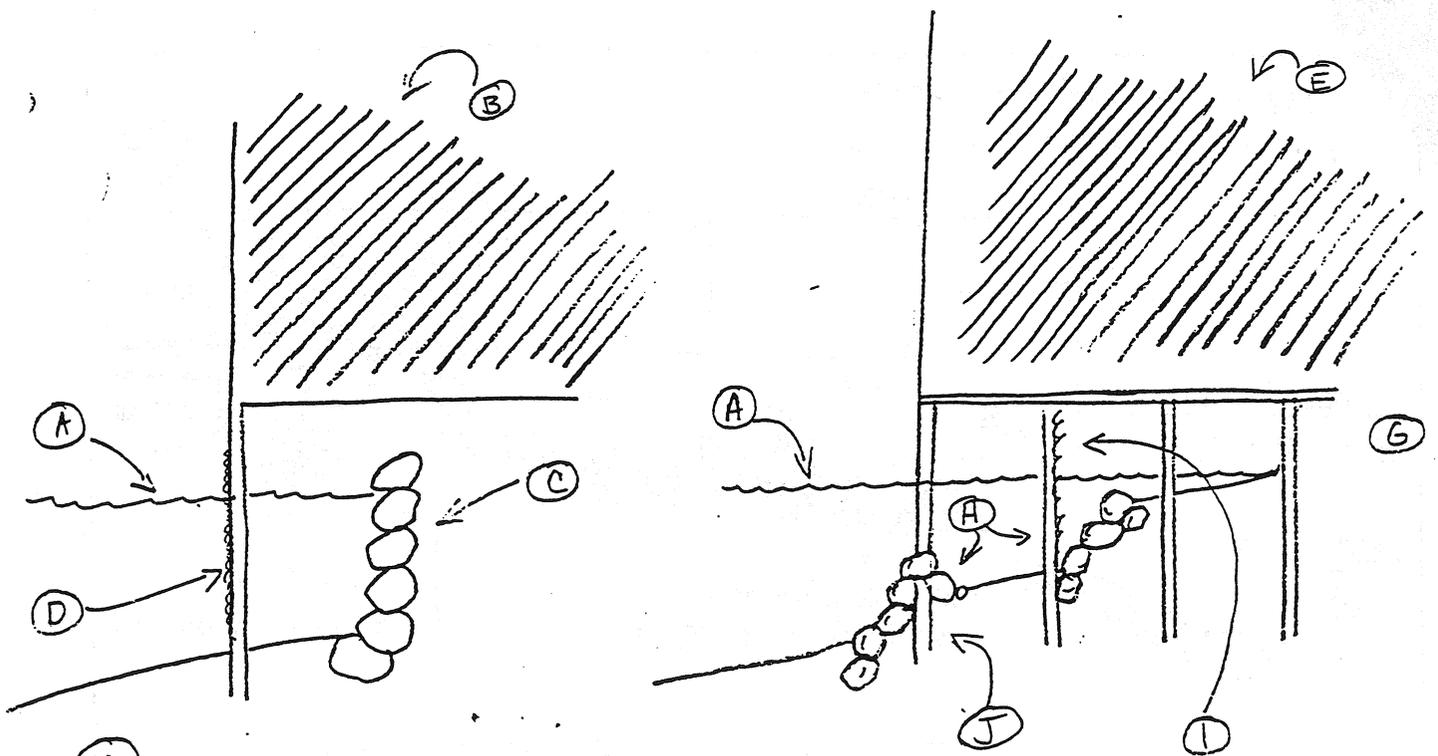


FIGURE # _____

Replacement or enhancement of riprap bulkheads beneath existing over-water buildings. Replace wood skirting with wire fencing to allow more sunlight penetration.

SOURCE: Boeing Duwamish Corridor Redevelopment



- (A) WATER LEVEL
- (B) EXISTING BUILDING
- (C) CONCRETE RUBBLE
- (D) EXISTING BUILDING SKIRTING
- (E) REDEVELOPED BUILDING

- (G) BUILDING FOUNDATION
- (H) ROCK RIPRAP
- (I) PILING WITH SECURITY NET *
- (J) FIRST ROW OF OLD PILES USED TO STABILIZE TERRACE.

* SECURITY SKIRTING SHOULD ALLOW FOR PASSAGE OF WILDLIFE.

Figure 2C. Prototype re-development site #3.

IMPROVED HABITAT AREAS

WHAT IS O.H.W.M. (DEFINE)
 WHAT IS ~~THE~~ TYPICAL ELEV.

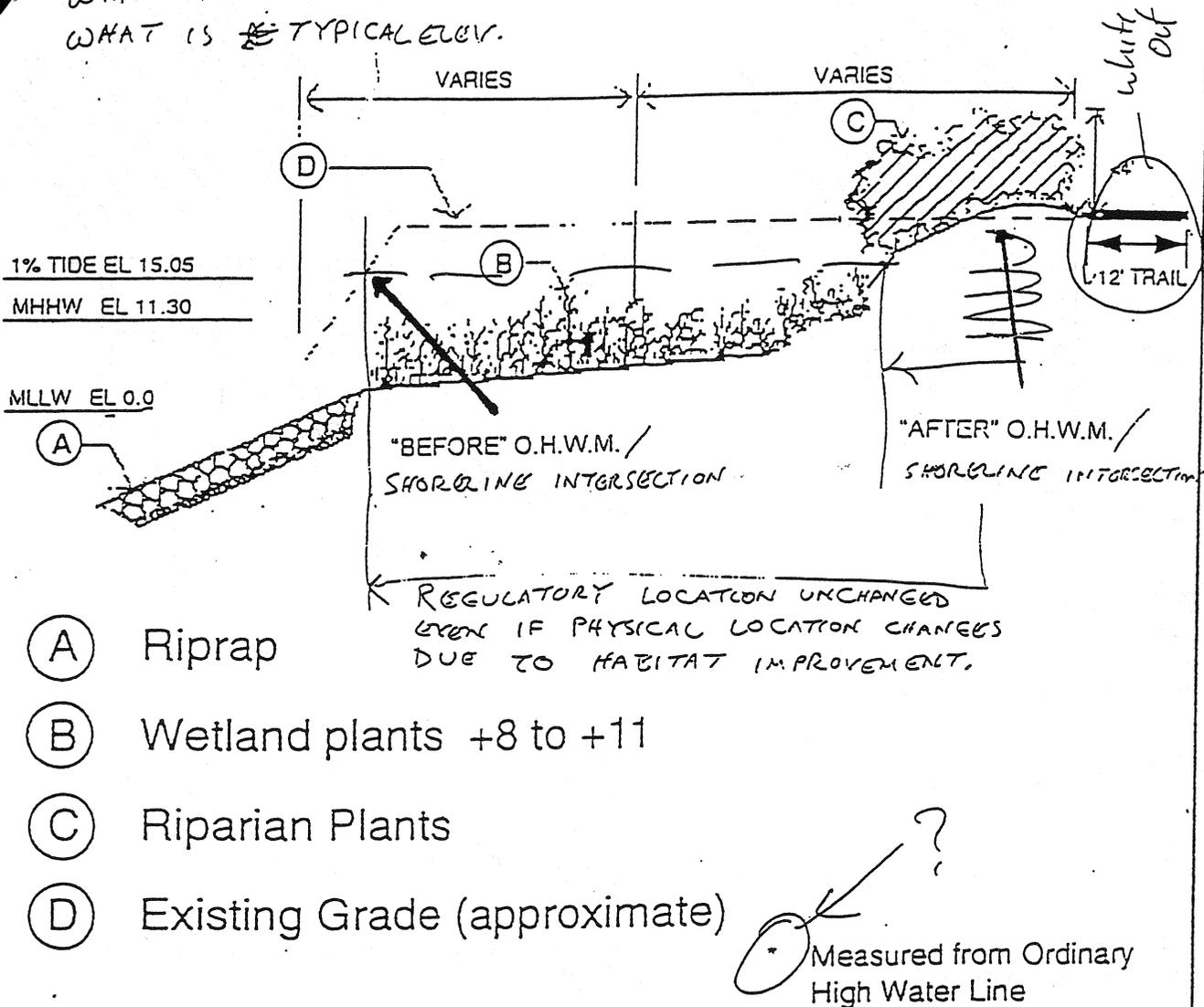
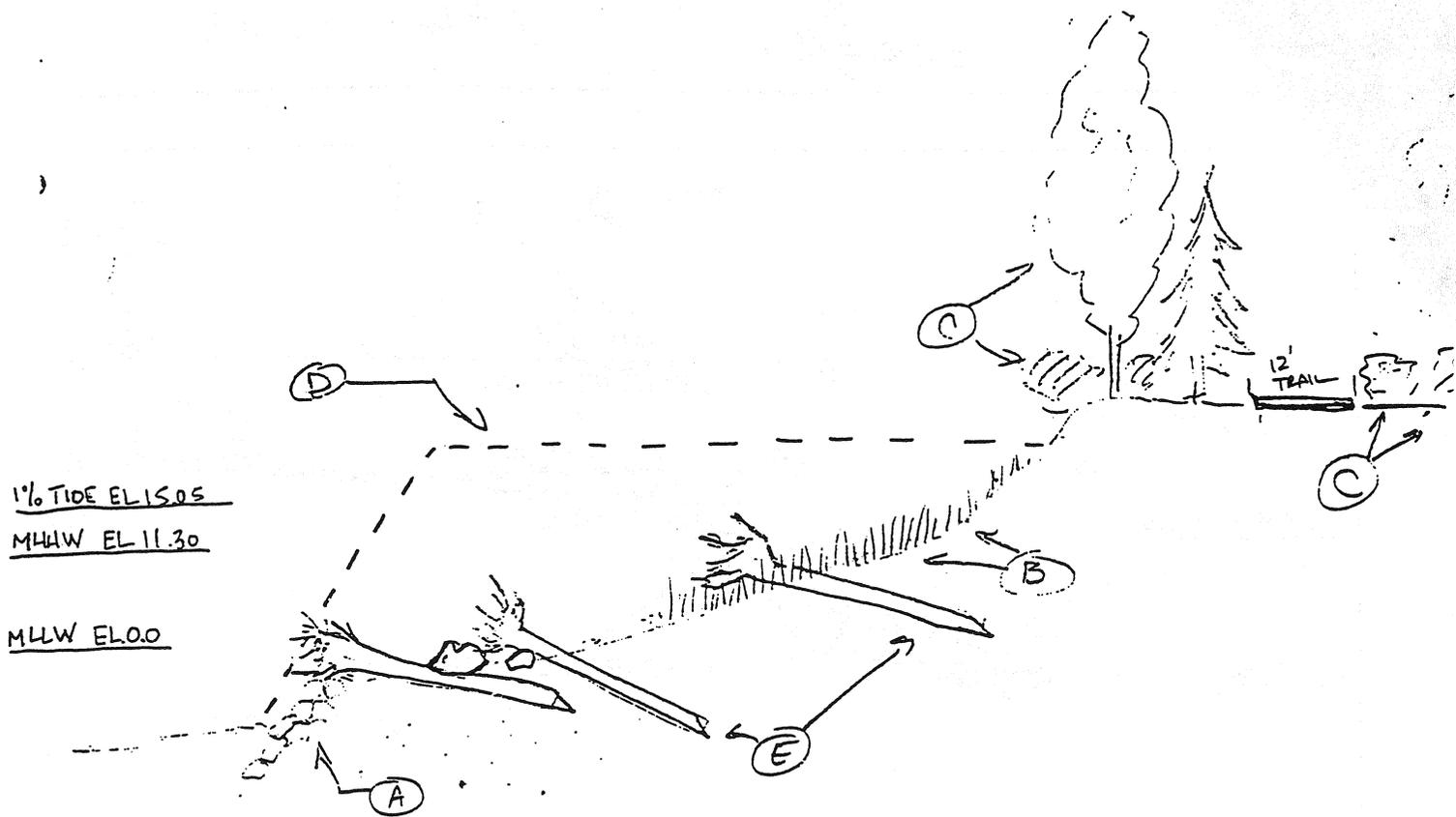


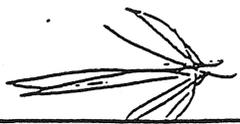
Figure 3A. Shoreline habitat profile.

Suitable design for creation of new wetlands/fisheries habitat areas, if desired. Although the location of the O.H.W.M. changes, provisions of the S.M.P. will allow this to occur without changing the location of the regulated shoreline zone.

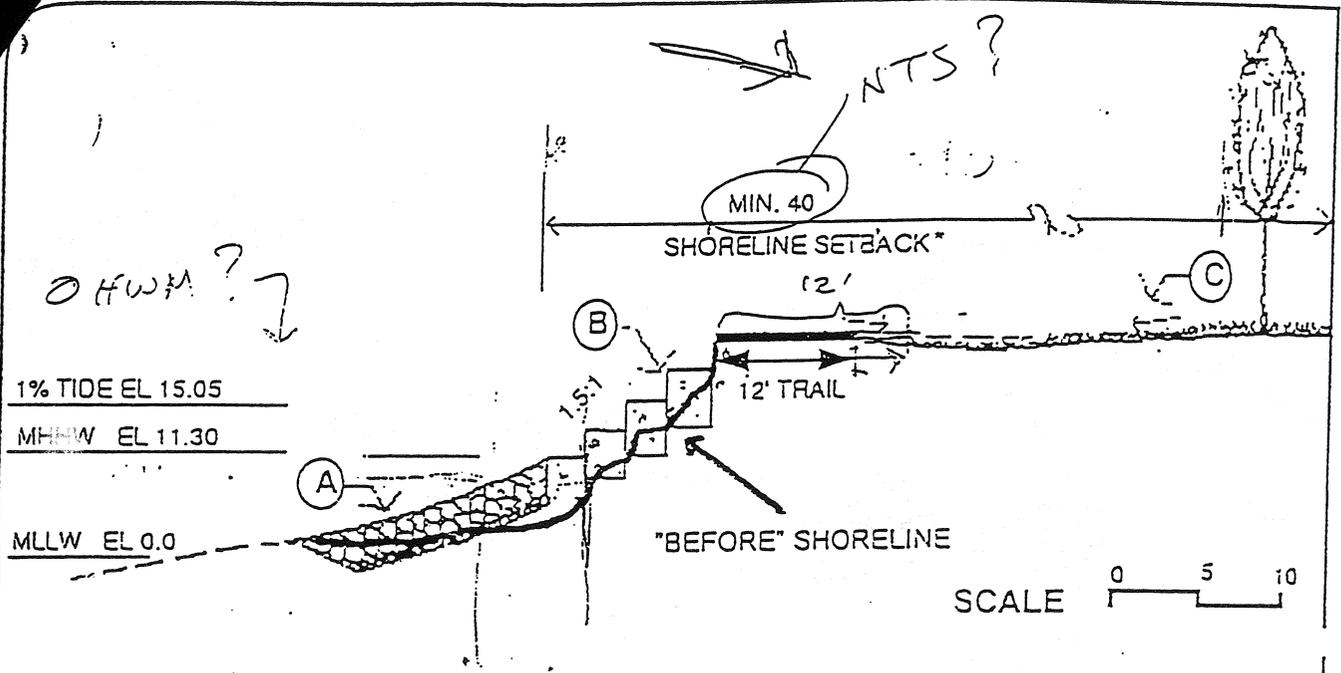


- (A) Riprap
- (B) WETLAND PLANTS
- (C) RIPARIAN PLANTS
- (D) EXISTING GRADE (APPROXIMATE)
- (E) - LOD

Figure 3B. Revised shoreline habitat profile.



MHW - 4.4
(OFW - 4.4) ?



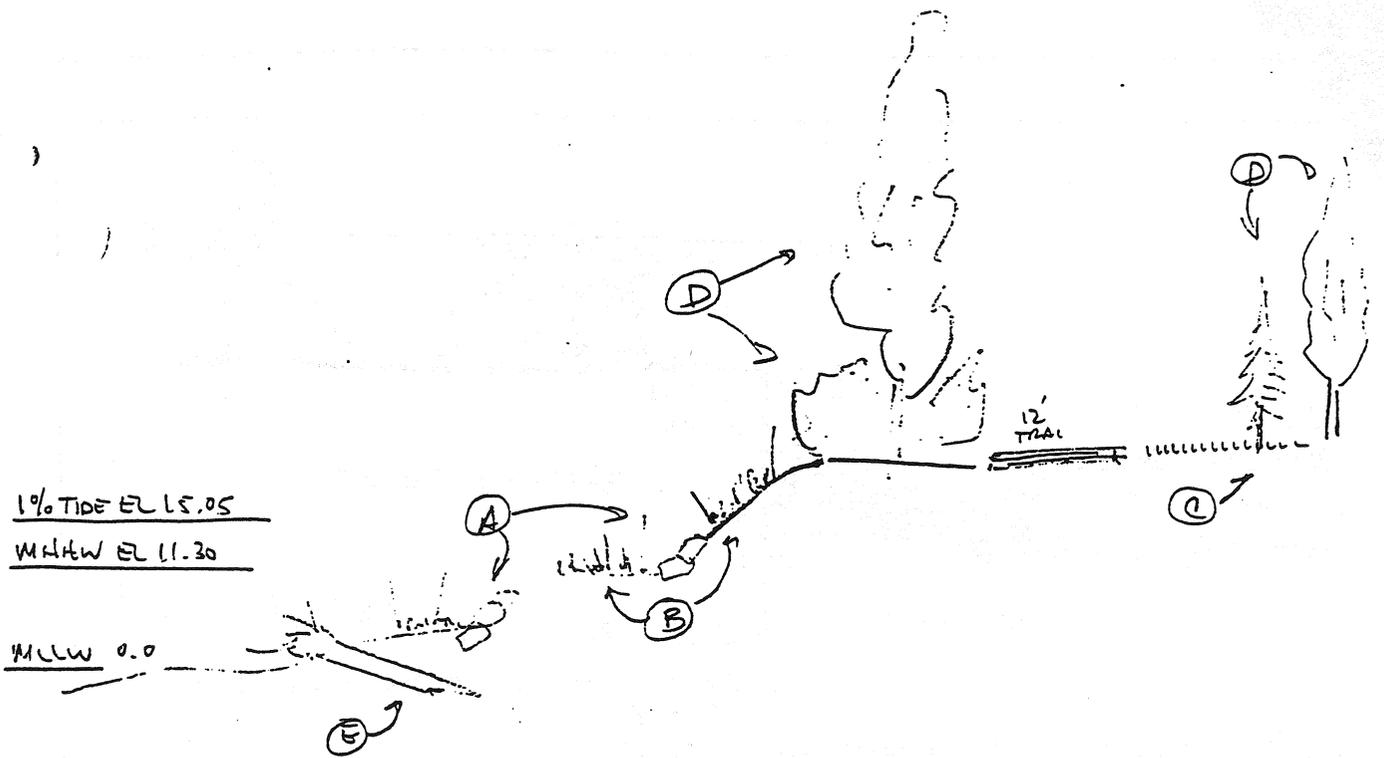
- (A) Riprap
- (B) Concrete / Timber Steps
- (C) Grass Swale

(Trail Location Optional)

Measured from Ordinary High Water Line ELEV = ?

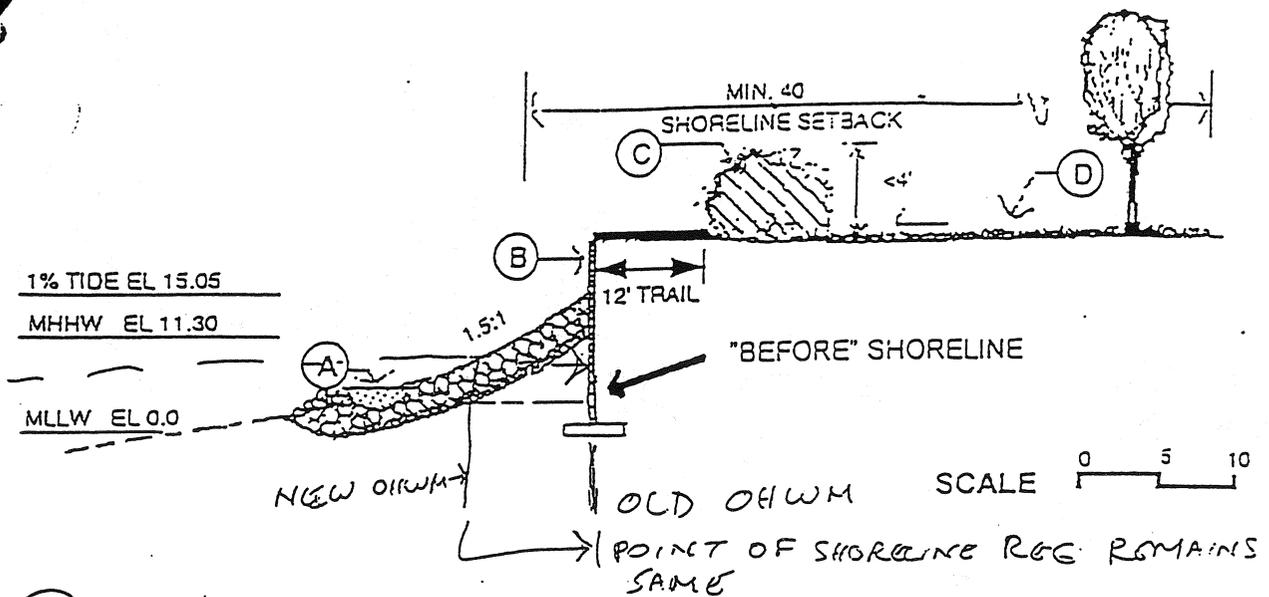
Figure 4A. Shoreline habitat profile.

Steps to shoreline. Standard also shows how bio-filtration swales can be incorporated into setback area.



- (A) Riprap
- (B) INTENTIONAL VEGETATION
- (C) BUISWALL
- (D) Riprap and Vegetation
- (E) LOD

Figure 4B. Revised shoreline habitat profile.



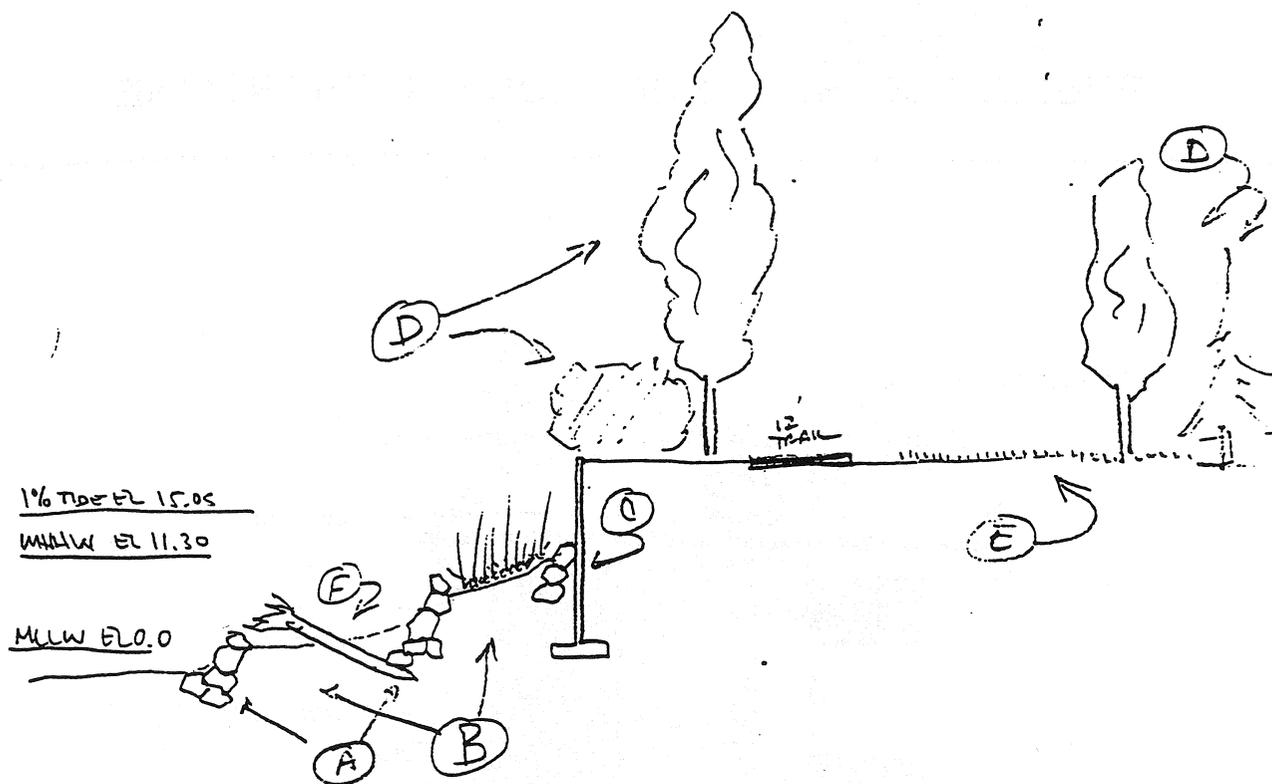
- (A) Riprap with intertidal bench
- (B) Bulkhead
- (C) Riparian Plants
- (D) Grass Swale

(Trail Location Optional)

* Measured from Ordinary High Water Line

Figure 5A. Shoreline habitat profile.

Riprap with vertical bulkhead, swale and landscaping behind.



- (A) RIPRAP TERRACE
- (B) INTERTIDAL BENCH
- (C) BULKHEAD
- (D) RIPARIAN PLANTS
- (E) GRASS/BIO SWALE
- (F) LOD

Figure 5B. Revised shoreline habitat profile.

Private

PUBLIC ACCESS CONNECTIONS TO SHORELINE

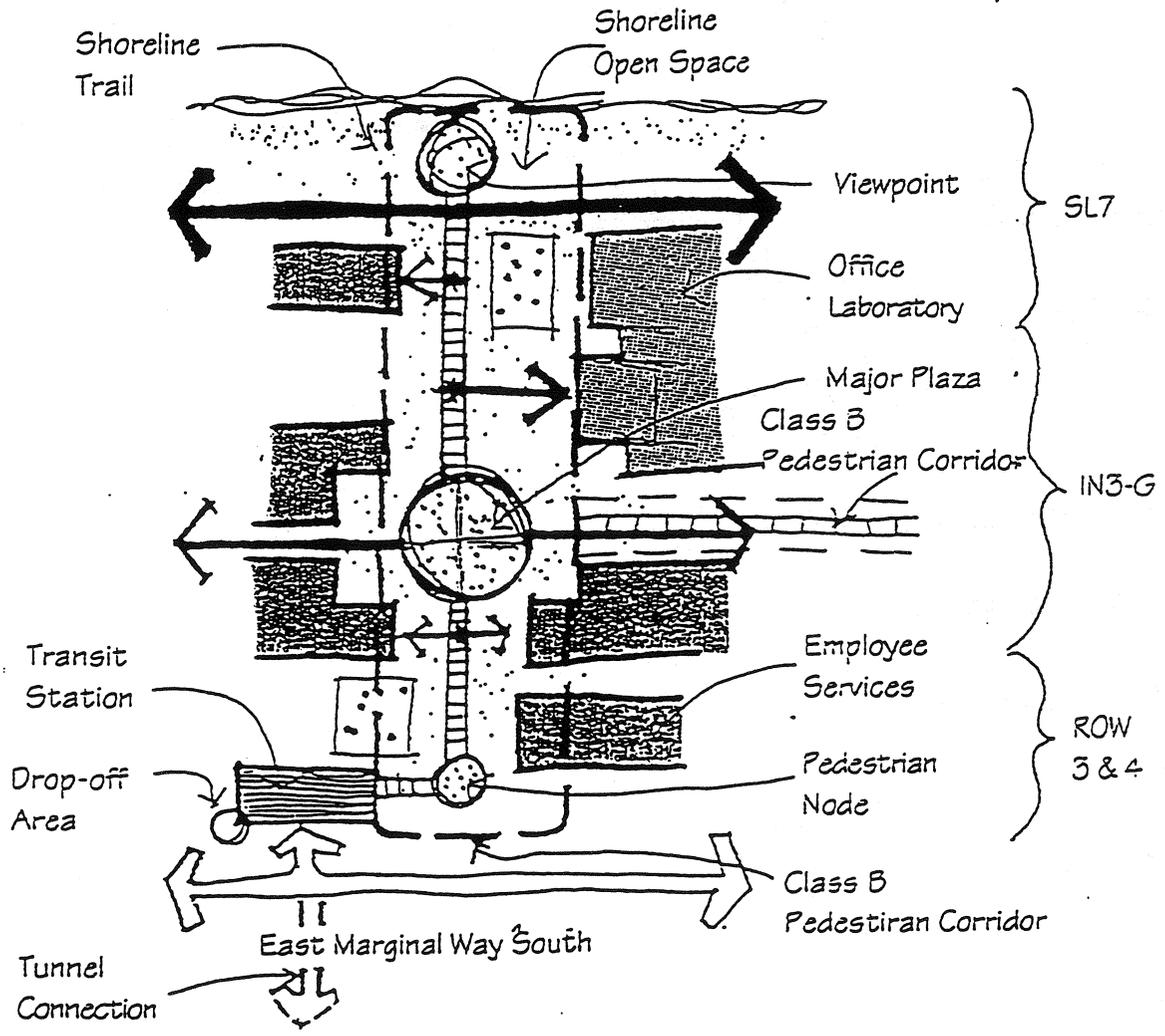


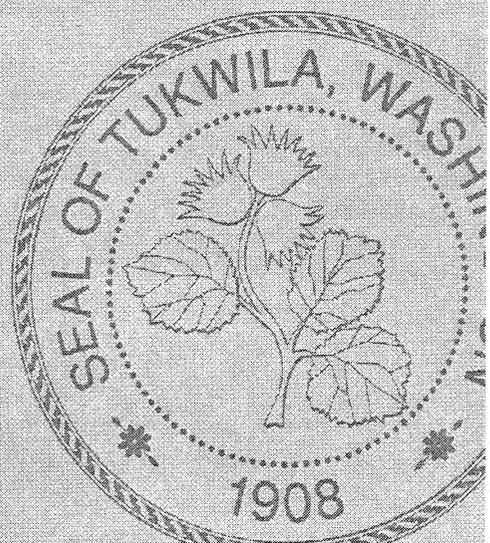
Figure 6. Public access connections to the shoreline.

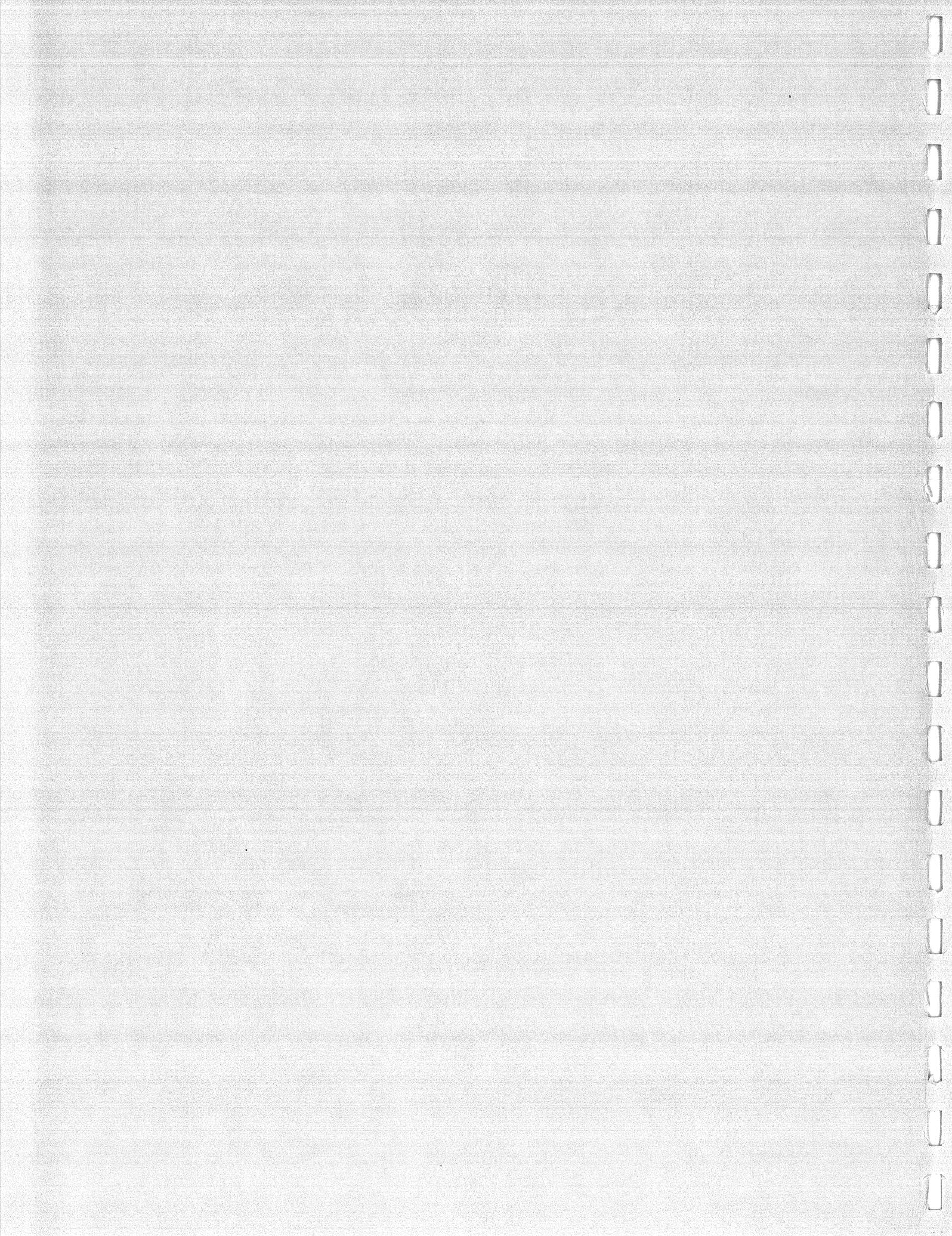
Public access required only where shoreline it links to the ~~Boeing~~ Duwamish River Trail.

to originally

adopted

Appendix C





Summary of Laws and Regulations Affecting Regulated Materials

Federal Laws and Regulations

Emergency Planning and Right to Know Act (SARA Title III)

SARA (Superfund Amendments and Reauthorization Act) Title III was promulgated in 1986 and establishes requirements for federal, state, and local governments and industry regarding emergency planning and community right-to-know reporting on hazardous chemicals. The act is designed to help "first response units" (e.g., Fire Departments of local communities) respond to accidental releases of hazardous chemicals. The act is also intended to increase the public's knowledge of, and access to, information regarding the presence, storage, and use of hazardous chemicals in their communities and releases of these chemicals into the environment.

Facilities that store specific quantities of chemicals designated under SARA Title III as "extremely hazardous substances" (EHS) are required to notify the State Emergency Response Commission (SERC) that they are subject to emergency planning requirements of SARA Title III, designate a facility emergency coordinator, and notify the Local Emergency Planning Committee (LEPC) of the designation. Facilities that store hazardous chemicals above specified threshold quantities must submit Material Safety Data Sheets (MSDSs) and inventory reports for the hazardous chemicals that exceed the threshold quantities. The MSDSs and inventory reports are submitted to the SERC, the LEPC, and the local fire department. The inventory reports must include information pertaining to the quantities of the hazardous chemicals stored, locations, type of storage, and the chemicals' associated health and physical hazards. The LEPC can also require that the facility prepare an emergency response plan.

Manufacturing facilities that manufacture, process, or otherwise use specified quantities of chemicals designated under SARA Title III as "toxic" must submit an annual report to the EPA and to the State regarding the discharge of these chemicals into the environment. If a facility has a release of an extremely hazardous substance or a CERCLA (discussed below) hazardous substance above reportable quantities, specific notification procedures must be followed that include notifying state and local authorities.

RCRA, Subtitle C--Hazardous Waste Management

The Resource Conservation and Recovery Act (RCRA) was promulgated in 1976 to promote the protection of health and the environment and to conserve valuable material and energy resources. RCRA has been amended twice, most recently in 1984.

Subtitle C of RCRA regulates the management of hazardous waste through a 3-step process that identifies wastes that must be regulated as hazardous; tracks the waste through its generation, storage, or disposal ("cradle to grave"); and controls practices used during

management of the waste by establishing technical and performance standards and permitting requirements.

EPA has promulgated regulations identifying the characteristics of hazardous waste and has established standards for hazardous waste generators, transporters, and treatment, storage, and disposal facilities regarding record keeping, manifesting, reporting, and permitting. In Washington, most of the RCRA program is administered by the Department of Ecology. Authorization for administration of some portions of the program has not yet been granted to the State, and EPA is responsible for these portions.

RCRA, Subtitle I--Underground Storage Tanks

These regulations apply to underground storage tanks (UST) containing petroleum or substances defined as hazardous under CERCLA (discussed below), with the exception of substances regulated as hazardous wastes under RCRA. The regulations require underground storage tanks to comply with national industry design, construction, installation, maintenance, and closure standards. UST systems are required to have spill and overfill prevention, leak detection systems, and tank and piping corrosion protection. The regulation also includes specific release monitoring, reporting, corrective action, and inventory control requirements.

Hazardous Materials Transportation Act

The United States Department of Transportation (DOT) administers the regulations promulgated under the Hazardous Materials Transportation Act, which are designed to protect the public from the mishandling of hazardous materials. The regulations require proper hazard classifications, packaging, labeling, placarding, and shipping papers for the transport of hazardous materials. Hazardous materials are classified in the DOT regulations according to their chemical and physical properties or their relative hazard to health. The transportation of hazardous wastes (as defined by RCRA) is also regulated by these laws. The regulations include specific reporting requirements in the event of an incident involving hazardous materials or wastes during transport.

Clean Water Act

The Clean Water Act regulates the treatment and discharge of wastewater into surface waters and publicly owned sewage treatment plants. The Clean Water Act also requires facilities that store specified volumes of oil products to take measures to prevent spills and to prepare a Spill Prevention Control and Countermeasure (SPCC) Plan. The purpose of the plan is to identify and establish procedures, methods, and equipment to prevent the discharge of oil to navigable waters. Under the act, secondary containment is required for aboveground tanks that store oil products.

The Clean Air Act

The Clean Air Act regulates the control and discharge of contaminants into the air; applicable portions are discussed in Chapter 6, Air.

Comprehensive Environmental Response, Compensation And Liability Act of 1980 (CERCLA Or Superfund)

CERCLA was promulgated in 1980. It requires facilities to notify the National Response Center of the releases of hazardous substances exceeding reportable quantities into the environment. The term "environment" includes navigable waters, groundwater, surface drinking water, land, and air. The definition of hazardous substances includes hazardous substances and toxic pollutants listed in the Clean Air Act, and any hazardous wastes having the characteristics described in RCRA. CERCLA also known as Superfund, also regulates the investigation and cleanup of sites with past hazardous chemicals disposal problems.

State Laws And Regulations

Hazardous Waste Disposal Act (70.105 RCW)

Regulations under this law are referenced as the Dangerous Waste Regulations (Chapter 173-303 WAC). These regulations incorporate portions of federal RCRA regulations and contain additional regulations pertaining to dangerous waste identification and management.

These regulations designate solid wastes that are dangerous or acutely hazardous to the public health and environment; provide for surveillance and monitoring of these wastes from "cradle to grave"; establish specific requirements for generators of dangerous wastes and transfer, storage, and disposal (TSD) facilities; and encourage recycling, reuse, reclamation, and recovery to the maximum extent possible. Requirements for generators and TSD facilities address permitting, record keeping, waste manifesting, facility operations and closure, and groundwater protection.

Waste Reduction Act (70.95C RCW)

The Waste Reduction Act requires hazardous waste generators who generate more than 2,640 pounds of hazardous waste per year and companies that use hazardous substances to prepare hazardous substance and waste reduction plans. Regulations under this act are referenced as the Hazardous Waste Planning Regulations (Chapter 173-307 WAC). The plan must include the following components, in order of priority: hazardous substance use reduction, waste reduction, recycling, and treatment. The act also establishes new hazardous waste fees. Rules to implement these fees are referenced as the Hazardous Waste Fees Regulations (Chapter 173-305 WAC).

Water Pollution Control Act (90.48 RCW)

This law regulates the discharge of contaminants into the waters of the state, which include lakes, rivers, streams, inland waters, underground waters, salt waters, and all other surface waters within the jurisdiction of the state. Special provisions are in the law to regulate the discharge of oil into waters of the state and to establish reporting requirements for oil discharge and the obligation to collect and remove or contain, treat, and dispose of the discharged oil.

Washington Industrial Safety And Health Act (WISHA)

Under the Occupational Safety and Health Act (OSHA) passed in 1970, individual states are allowed to administer their own employee safety and health plans and programs. WISHA passed in 1973, and in 1976 Washington created the first fully operational state safety and health plan approved by the Federal Government. The regulations (Chapter 296-24 and 296-62 WAC) give the Washington State Department of Labor and Industry the primary responsibility for worker health and safety in Washington. Employers are required to comply with employee health and safety standards and requirements including standards for equipment, exposure to hazards, hazard communication and training programs, and accident prevention programs, as well as maintain records of accidents. Facility compliance is monitored through routine and event-specific inspections.

Model Toxics Control Act

The Model Toxics Control Act (MTCA) (Initiative 97), passed in 1988, requires the Department of Ecology to clean up sites where releases of hazardous substances that may present a threat to human health or the environment have occurred. The regulations (WAC 173-340) to implement MTCA took effect in May 1990. These regulations provide the framework for identifying, investigating, and selecting cleanup actions at hazardous substance sites in Washington. Cleanup standards were proposed as an amendment to the overall cleanup regulation (August 1, 1990, State Register (90,15)). The amendments were finalized in January 1991 and became effective in February 1991. The act also imposes a 0.7 percent tax on the wholesale value of hazardous substances, including petroleum, to fund cleanup, regulatory, and citizen involvement programs.

Local Laws and Regulations

The primary local law and regulation that affects hazardous materials and waste management is the Uniform Fire Code.

1988 Uniform Fire Code

The 1988 UFC is much more detailed than earlier fire codes regarding hazardous materials. Article 80 of the UFC establishes requirements for the prevention, control, and mitigation of dangerous conditions related to hazardous materials (including wastes) and for providing information needed by emergency response personnel. Requirements for the storage, dispensing, use, and handling of hazardous materials, as well as recording and notification requirements when an unauthorized discharge becomes reportable under federal, state, or local regulations, are also addressed in Article 80.

In addition, under the 1988 UFC the Fire Marshall can require Hazardous Materials Inventory Statements (HMIS) for each building in which hazardous materials are stored, and a Hazardous Materials Management Plan (HMMP), which describe the hazardous materials operations at a facility, including monitoring, security, labeling, training, inspections, record keeping, and emergency equipment.