SEATTLE SHORELINE MASTER PROGRAM UPDATE

COMPARISON OF LAND SUPPLY AND DEMAND FOR WATER-DEPENDENT AND WATER-RELATED USES

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DECEMBER 2009

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INTRODUCTION AND SUMMARY

INTRODUCTION

The City of Seattle is updating its Shoreline Master Program (SMP) on a comprehensive basis for the first time since 1987. The SMP constitutes the policies and regulations governing development and uses in and adjacent to marine and freshwater shorelines. In Seattle this includes the shorelines of Puget Sound, Lake Washington, Lake Union/Ship Canal, Duwamish River, Green Lake, as well as associated wetlands and floodplains.

Updating the SMP is a requirement of the Washington Shoreline Management Act (SMA). The SMA is generally intended to balance "reasonable and appropriate uses" with adequate protection of shoreline resources. Reasonable and appropriate uses include water-oriented uses, defined to include the following.

- "Water-dependent use" means a use or portion of a use which cannot exist in a location that is not adjacent to the water and which is dependent on the water by reason of the intrinsic nature of its operations.

- "Water-related use" means a use or portion of a use which is not intrinsically dependent on a waterfront location but whose economic viability is dependent on a waterfront location because:

    a) The use has a functional requirement for a waterfront location such as arrival or shipment of materials by water or the need for large quantities of water; or

    b) The use provides a necessary service supportive of the water-dependent uses and the proximity of the use to its customers makes its services less expensive and/or more convenient.

- "Water enjoyment use" means a recreational use or other use that facilitates public access to the shoreline as a primary characteristic of the use, or a use that provides for recreational use or aesthetic enjoyment of the water for a substantial number of people.

To help the City evaluate zoning regulations and policies relating to the protection of water-dependent and water-related uses, the Department of Planning and Development (DPD) sought a market analysis of water-dependent and water-related uses. Stakeholder comments often conflict over land use and real estate trends in Seattle's shoreline jurisdiction. Some property owners complain that non-water-dependent businesses are forcing out marine industrial uses by increasing property values and raising liability issues. Others say that the SMA preference for water-dependent/water-related uses and the City's implementation of this policy make it impossible to find tenants, citing declines in marine industries. Still others say that increased flexibility for non-water-oriented industries could help support remaining water-dependent ones. Key questions that DPD needs to address include:

- Are the current land needs of Seattle's water-dependent and water-related industries being met?

- What are the projected land needs of water-dependent and water-related industries over the next 20 years?

- Are certain shoreline areas more likely than others to experience increased demand?

- Which non-water-dependent and non-water-related uses are most supportive of water-dependent uses?

Property Counselors conducted a study to address these issues. The scope of the study included the following tasks:

1. Identify growth trends for water-dependent and water-related uses through interviews with representatives of businesses and property owners, and secondary sources of data and properties.

2. Work with 2006 inventory of waterfront properties to identify current uses and available properties.

3. Project future land needs based on growth in demand with adjustments for existing unused capacity and increases in productivity.

4. Compare projected increased demand with available land supply.

5. Draw conclusions related to adequacy of land supply and appropriateness of uses.

This report documents the results of the study. It is organized in five sections:

Introduction and Summary

Description of Water-Dependent and Water-Related Uses

Analysis of Land Supply and Demand

Conclusions and Recommendations

Appendices

The major conclusions are summarized in the remainder of this section.

SUMMARY

WATER-DEPENDENT AND WATER-RELATED USES

MARINE CARGO HANDLING

The Port of Seattle owns four container terminals in the Seattle harbor. The outlook for growth in cargo volumes is strong with 20-year growth projected at over 4% per year for Puget Sound ports. The existing terminals have the capacity to accommodate significant increases in throughput with changes in equipment and handling methods.

Breakbulk cargo is transported on both cargo ships and barges, with both scheduled and contract service. Breakbulk service is primarily related to service to Alaska. The fishing industry and construction projects have been the two primary sources of business. The projected growth rate for domestic breakbulk cargo is 0.6% per year. Many breakbulk facilities are operating at capacity.

FISHING INDUSTRY

Seattle is the service center for the North Pacific fishing fleet, which harvests salmon, pollock, cod, halibut, and crab. The American Fisheries Act of 1998 reshaped the structure of the industry, reducing the size of the fleet and specifying a quota system. As a result, the fisheries that the Seattle fleet participates in are considered to be the best managed, and the resource is considered to be healthy. At this time, the industry is considered to be mature with limited opportunities for exceptional growth.

FISH PROCESSING AND COLD STORAGE

Much of the catch of the North Pacific fleet is processed at sea or in shore-based plants in Alaska. There has been a decline in the number of processors in Seattle. Within the remaining plants in Seattle, less than one-half of the product comes over the dock. The prospects for growth are related to niche markets and secondary processing.

SHIPYARDS AND SHIP REPAIR

The shipyard sector in the Seattle area has declined over the past decade with the loss of two prominent shipyards. While work related to the fishing industry has declined precipitously, work for the US Navy, US Coast Guard and Washington State Ferries has supported other yards. Yacht refit, conversion and repair reported steady work until the current recession. The outlook for the industry is mixed. Minimal expansion of facilities is expected.

SHIP EQUIPMENT AND REPAIR

This sector involves generally small firms providing equipment such as engines and propellers, deck machinery, cranes and electrical components. Suppliers include a range of uses from chandlers to bunker fuel suppliers and bilge cleaning services. Their

prospects for growth are tied closely to the shipbuilding and fishing sectors. Many of these businesses are not located on the waterfront, although they benefit from proximity.

HARBOR SERVICES

Harbor services include pilotage, tugboat assistance, and environmental response. Several of these businesses were forced to relocate when the Port expanded Terminal 18 on Harbor Island. With the trend to larger vessels, there are fewer ships in some cases, and less demand for harbor services. Demand for environmental response has increased with additional regulation.

INTERMODAL

Intermodal uses include intermodal yards, container freight stations and warehouses, and container storage and repair. Intermodal freight transportation represents over 70% of the Port's container volume, and will continue to grow as container volumes grow. Off-dock activities don't have to be on the waterfront, but benefit from nearby locations to reduce transportation time.

CONSTRUCTION AND RESOURCES

Marine construction firms require waterfront sites to store and load cranes and barges. Resource firms produce and distribute cement, concrete, aggregate and other construction materials. Most of the material arrives over water. These uses will grow with the construction sector generally, and particularly with bridge and other transportation projects.

RECREATIONAL MARINAS

Occupancy among local marinas has generally remained high, particularly at close-in locations such as Lake Union and the Ship Canal. A slight increase in vacancy has accompanied the economic recession during the past year. Cost increases and subsequent increases in moorage rates have driven some users out of the Seattle area. Dry stacking facilities have multiplied, particularly along the north end of Lake Union and the western end of the Ship Canal. Capabilities of such facilities are limited, as sailboats and larger powerboats cannot be accommodated. Stable operations are forecasted by most marina owners due to the lack of developable sites locally and boat owners' desire for quick access.

PASSENGER TRANSPORTATION

This category includes cruise vessels, ferries, and sightseeing vessels. The largest user is the Port's cruise ship terminals at Pier 66 and Pier 91. Cruise activity grew at explosive rates from 11,000 passengers in 1993 to 890,000 in 2008. With the opening of the Terminal 91 facility, the Port greatly increased its capacity. Existing facilities should be adequate to support future growth.

LAND SUPPLY-DEMAND ANALYSIS

LAND SUPPLY

Based on a 2006 inventory prepared for the City, the supply of land, including dry and submerged lands in the shoreline zone, is estimated to be 314 million square feet, or 7,200 acres. Approximately two-thirds of that total is dry land and the remainder is submerged land. The breakout of the total by dependency designation and shoreline sector is summarized in the following table.

Table 1
Shoreline Inventory 2006
Summary of Dependency Designation and Shoreline Sector
(Square Feet)

	Dry Waterfront	Uplands	Total Land	Submerged	Total Land & Water
Water Dependent	54,711,578	1,216,116	55,927,694	29,253,640	85,181,335
Water-Related	8,522,623	592,971	9,115,595	1,239,971	10,355,566
Water-Enjoyment	-	-	-	-	-
Park	56,316,973	16,552,081	72,869,054	35,865,098	108,734,153
Floating Home	175,532	5,500	181,032	1,122,633	1,303,665
Non Water Dependent	37,088,121	22,549,390	59,637,511	17,943,845	77,581,356
Vacant	2,996,408	2,295,270	5,291,678	25,933,231	31,224,908
Total	159,811,235	43,211,328	203,022,564	111,358,418	314,380,981

	Dry Waterfront	Uplands	Total Land	Submerged	Total Land & Water
Central Waterfront	132,594	888,517	1,021,111	2,421,425	3,442,536
Duwamish	41,441,222	1,102,151	42,543,374	10,164,104	52,707,478
Elliott Bay 1	3,614,985	1,395,090	5,010,075	4,076,088	9,086,163
Elliott Bay 2	4,193,002	11,844	4,204,846	1,001,253	5,206,098
Elliott Bay 3	211,135	193,335	404,469	905,085	1,309,554
Green Lake	2,920,533	4,441,439	7,361,972	504	7,362,476
Lake Union	3,242,486	2,448,476	5,690,963	5,718,276	11,409,239
Lake Washington	57,673,432	10,717,628	68,391,060	19,716,264	88,107,324
Portage Bay	3,511,549	1,140,958	4,652,507	2,656,059	7,308,566
Puget Sound Central	19,170,313	1,121,254	20,291,567	27,046,260	47,337,827
Puget Sound North	2,884,282	10,953,567	13,837,849	6,558,636	20,396,484
Puget Sound South	11,376,181	4,339,426	15,715,607	20,659,287	36,374,893
Shilshole	1,610,919	1,811,495	3,422,414	5,673,052	9,095,466
Ship Canal	7,828,603	2,646,149	10,474,751	4,762,128	15,236,879
Total	159,811,235	43,211,329	203,022,564	111,358,419	314,380,984

LAND DEMAND

The demand for land for water-dependent and water-related uses is estimated using data from the inventory for specific categories of use as a base, and applying a growth rate that reflects both the outlook for increases in activity plus any adjustments for excess capacity or changes in productivity.

Table 2
Projected Increase in Land and Water Demand
2008 to 2030
(Square Feet)

	Current Use	Growth 2008-2030
Seafood Products	688,320	-
Petroleum Refining	799,736	-
Stone Clay and Glass	5,867,939	825,375
Primary Metal	1,101,808	-
Fabricated Metal Marine	80,366	5,475
Commercial Boat Building	56,482	3,848
Ship Building	1,642,073	111,860
Ship Building w/ Drydock	866,498	59,027
Ship Building w/o Drydock	90,453	6,162
Misc. Marine Supply Mfg.	112,094	7,636
Marine Passenger	1,352,620	-
Container Marine Shipping	23,278,130	-
Non-Cont. Marine Shipping	5,949,292	836,817
Business Services	2,880,006	704,783
Contract Construction Marine	242,899	34,166
Education	13,514,478	-
Marine Repair or Service	2,739,621	186,626
Marinas Recreational	20,615,792	2,899,783
Moorage Non-Res/Comm	650,254	91,464
Fishing Acivities/Services	1,174,418	-
Total	83,703,279	5,773,020

Demand for water-dependent and water- related is compared to supply in Table 3.

Table 3
Summary of Supply Demand Comparison
2008 to 2030
(Square Feet)

Primary Uses	Duwamish	Ship Canal	Lake Union	Portage Bay	All Zones
	Resources	Recreational Marina	Recreational Marina	Recreational Marina	
	Business Services	Business Services	Ship Building		
	Non Cont. Shipping	Non Cont. Shipping	Commercial Moorage		
	Recreational Marina	Marine Repair	Business Services		
	Ship Building	Commercial Moorage	Marine Repair		
Demand 2008 to 2030					
Dry Waterfront	1,563,848	575,195	169,590	38,289	2,653,329
Uplands	65,519	50,378	21,930		250,411
Submerged Lands	303,706	475,470	453,920	165,265	2,869,280
Total	1,933,073	1,101,043	645,440	203,554	5,773,020
Vacant Land					
Dry Waterfront	1,019,333	10,606	3,082	17,660	2,996,408
Uplands	-	31,834	155,328		2,295,270
Submerged Lands	2,077,832	6,116	24,884	87,290	25,933,231
Total	3,097,165	48,556	183,294	104,950	31,224,908
Non-Waterdependent Use Land					
Dry Waterfront	8,553,863	1,373,966	624,785	444,178	37,263,653
Uplands	811,776	2,201,909	1,918,208	1,132,666	22,554,890
Submerged Lands	416,359	69,324	1,091,770	540,156	19,066,478
Total	9,781,998	3,645,199	3,634,763	2,117,000	78,885,021

There are several areas in which the demand for land for water-dependent and water-related uses exceeds the amount of vacant land. In particular, the projected demand for dry waterfront land in the Duwamish, Ship Canal, Lake Union, and Portage Bay all greatly exceeds the amount of vacant dry waterfront land. In most cases, the demand is not transferrable to other shoreline sections.

Additionally, there is more land currently in non-water-dependent or non-water-related use than the projected increase in demand by water-dependent and water-related uses. It's not clear from the inventory, the extent to which the non-water-dependent or water-related uses are susceptible to change to alternative uses. In particular, it's not clear which of those lands could be acquired at an affordable price. Further, the individual vacant parcels may not be appropriate in size or offer required adjacencies to meet the needs of the water-dependent and water-related uses. For this reason, the amount of suitable vacant land is overstated.

Finally, projected sea level rise could significantly reduce land supply for water-dependent/water-related businesses. Even in conservative projections, Harbor Island and portions of the Duwamish industrial area are likely to be inundated. Not only will this decrease the supply of land for potential expansion, it is likely to displace existing uses.

OTHER ISSUES

Three issues deserve consideration in this comparison:

1. What is the effect of land price on demand, and how do restrictions on use affect price?

   An analysis of land price trends in Seattle industrial areas indicated that the growth in industrial land prices isn't particularly dramatic when only properties intended to be developed for industrial uses are considered. The properties intended for commercial use supported higher values because those uses could pay more. Thus it's not unreasonable to make demand projections that assume stable prices, but any changes in allowable uses could invalidate those projections.

2. How are uses interrelated and are there uses that are important to support water-dependent and water-related uses?

   Many marine industry participants talk about the importance of the marine business cluster and the availability of goods and services nearby. These relationships are borne out by an analysis of the supply chain for fishing, water transportation and shipbuilding. These results match the responses we received in our interviews. Specifically, interviewees talked about the importance of:

   Material Suppliers
   Repair Services
   Tugboats
   Crane Operators
   Grocery Suppliers
   Hardware Stores
   Yacht Brokers
   Restaurants
   Finance and Insurance
   Machine Shops
   Fuel
   Harbor Assistance
   Government Agencies.
   Cold Storage

Land use policies that encourage these types of businesses to locate near the waterfront will benefit marine industries as a whole.

RECOMMENDATIONS

1. The City should continue to restrict the development of non-water-dependent and water-related uses in the shoreline zones to assure that suitable dry and submerged lands are available for water-dependent and water-related uses.

2. The City should provide greater flexibility for secondary non-water-dependent and non-water-related uses that are important parts of the supply chain for marine businesses, or that do not preclude future use by water dependent businesses to locate within the shoreline zone, but not as a primary use.

3. The City should facilitate the expansion or development of water-dependent and water-related uses by reducing, wherever possible, the period necessary to secure permits.

DESCRIPTION OF WATER-DEPENDENT AND WATER-RELATED USES

An understanding of the various water-dependent and water-related uses provides a basis for projecting future demand for land. The uses considered in this analysis include marine industrial uses and recreational moorage. The uses do not include public access or environmental mitigation sites. The information provided in this section is derived from secondary sources and from a series of interviews with representatives of the various uses. The list of persons interviewed is included in Appendix 1. Each category of use is described in this section in terms of major users, industry trends, growth outlook, and facility use.

CONTAINER LINES AND TERMINALS

Container terminals are a major line of business in the Marine Division of the Port of Seattle and represent a major source of Port investment.

MAJOR USERS

The Port's container facilities are located in the South Harbor of Elliott Bay. The Port owns four container facilities: Terminal 5, Terminal 18, Terminal 30, and Terminal 46. Twenty-one major shipping lines use Port container terminals. The characteristics of the four container terminals are summarized in Table 4.

Table 4
Port of Seattle Container Terminals

	Acres	Berths	Cranes	On-Dock Rail
Terminal 5	182	3	6	Yes
Terminal 18	196	4	7	Yes
Terminal 30	70	2	6	No
Terminal 46	88	2	5	No

Source: Port of Seattle.

The primary trading partners are Asian countries, with China, Japan, Korea and Taiwan representing 77% of dollar volume in 2008.

Most of the shipping lines have joined alliances and share space on their ships with their fellow alliance members. The major alliances are:

New World Alliance: APL, Hyundai, Mitsui, and NOL

Grand Alliance: NYK, Hapag-Lloyd, P&O, Nedlloyd, OOCL, and COSCO

The New World Alliance uses Terminal 5 and the Grand Alliance uses Terminal 18. China Shipping occupies Terminal 30. Hanjin occupies Terminal 46.

INDUSTRY TRENDS

Four major trends will continue to affect the amount of container trade through Port of Seattle facilities:

Alliances. With alliance members sharing space on ships with fellow members, utilization of individual ships should increase, and reduce operating costs.

Larger Vessels. The newest container ships can handle over 10,000 TEUs (20-foot equivalent units) versus 6,000 20 years ago. The same number of containers requires fewer calls. At the same time, terminals must be larger and equipment upgraded.

Increase in All Water Routes to U.S. East Coast. With planned expansion of Panama Canal, this trend will continue, but the relatively shallow East Coast harbors will need to be dredged to fully capitalize on this opportunity.

Intermodal. A large share of container traffic, currently 70%, is bound for or originates at points inland. On-dock rail is increasingly important to facilitate freight movement.

Load Centering. As a result of larger vessels and alliances, lines can accommodate their operations with fewer ports of call.

Cargo volume trends at Seattle terminals are summarized in Table 5.

Table 5
Seattle Harbor History of Cargo Volumes Handled: 1999–2008

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Containerized Cargo in TEUs										
Total International TEUs	1,195,150	1,201,841	1,052,789	1,173,251	1,184,698	1,466,251	1,745,798	1,636,261	1,628,494	1,376,496
Total Domestic TEUs	294,899	286,427	262,320	265,625	301,684	309,607	342,131	351,099	345,010	327,996
Combined Total TEUS	1,490,048	1,488,267	1,315,109	1,438,872	1,486,382	1,775,858	2,087,929	1,987,360	1,973,504	1,704,492
Metric Tons										
Total Containerized Metric Tons	10,717,745	11,664,031	9,941,504	9,704,293	9,790,946	11,767,710	14,460,124	13,713,700	14,584,816	12,466,101
Non-Containerized Breakbulk	474,464	449,183	220,429	174,778	117,925	149,750	144,280	131,984	116,571	106,854
Bulk										
Grain	1,878,344	2,131,622	2,714,874	1,676,820	3,107,732	3,898,491	5,049,107	5,901,821	5,333,018	6,400,778
Petroleum	1,995,932	1,914,201	1,591,481	1,098,352	909,879	853,756	874,475	976,526	1,064,744	938,463
Molasses	29,804	37,152	52,918	53,350	46,814	43,541	36,874	45,103	46,648	65,019
Grand Total Tonnage	**15,178,939**	**16,280,821**	**14,573,379**	**12,707,593**	**13,973,296**	**16,713,248**	**20,564,860**	**20,769,134**	**21,145,797**	**19,977,215**

Source: Port of Seattle Container and Tonnage Statistics Reporting System.

In the short term, the economic downturn in Asia in 2008 and 2009 has affected Port container activity. Port container volumes were down 14% from 2007 to 2008 and an additional 16% in 2009 to date. Beyond the short term, the Asian economies are expected to recover, and container activity should return to normal growth trends.

OUTLOOK

The long-term growth outlook for container trade at the Port of Seattle is strong, as reflected in the Washington Public Ports Association (WPPA) cargo projections.

2008–2010	-0.5%
2010–2015	5.3%
2015–2020	4.9%
2020–2025	4.6%
2025–2030	4.5%

LAND AND FACILITY USE

Use of container terminals can be characterized by several key factors.

- The Port has recently expanded Terminals 18 and 30. Current capacity exceeds container volumes.

- There is the potential for significant increases in container throughput. Peak container volumes in 2005 were equivalent to 3,900 TEUs per acre. According to BST, the lead consultant on the WPPA cargo projections, productivity in Puget Sound container terminals could increase to 7,700 TEUs per acre by 2028.

BREAKBULK FREIGHT

Breakbulk service includes both general cargo on small carriers, as well as equipment and some commodities. Breakbulk service is provided by both cargo ships as well as barges.

MAJOR USERS

Coastal Transport is the only remaining company in the area operating cargo ships to Alaska. At one time there were five carriers on the Ship Canal. Coastal operates seven vessels, each providing weekly service to Western Alaska. There are also several barge services to communities in Alaska. Alaska Marine Lines provides twice-weekly service to Southeast Alaska, weekly service to Whittier, and weekly service on a combined container/rail barge to Whittier. Northland operates barge service to Southeast Alaska, Anchorage, and Dutch Harbor. It serves small Alaskan communities with landing craft. It also serves Honolulu every three weeks. Crowley Marine Services, Sea-Tac Marine Services, and K-Sea Transportation provide barge service on a contract basis.

Cargo includes palletized freight, containers, construction materials, vehicles, and modular buildings. The fishing industry and construction projects are the two primary sources of business.

INDUSTRY TRENDS

Alaska activity has varied with the amount of construction activity in the state and conditions in the fishing industry. Fishing-related activity has been good recently, but there haven't been major construction projects in the state. The largest potential project in Alaska is the long-discussed gas pipeline. While many feel this project is becoming closer to reality, there is no firm schedule in place at this time.

There is a general trend to larger barges. However, larger barges have a higher minimum threshold for efficient sailing. When cargo volumes are down, there is pressure to reduce frequency of service.

GROWTH OUTLOOK

The WPPA cargo forecasts identify the following growth rates for domestic breakbulk cargo in Puget Sound ports.

2007–2010	-0.2%
2010–2015	1.5%
2015–2020	1.2%
2020–2025	0.9%
2025–2030	0.8%

The operators we interviewed generally concur with the near-term forecasts.

LAND AND FACILITY USE

Coastal Transportation is the only breakbulk freight company left on the Ship Canal. They own their site and are comfortable with their location. The barge services, however, prefer Duwamish locations because they aren't restricted by the Government Locks.

Breakbulk terminals are land intensive businesses. The Northland site is 60 acres at T-115. The Coastal site east of the Ballard Bridge is 20 acres, but one-third of the site is occupied by non-marine businesses. The Alaska Marine Lines site is only 18 acres. They have purchased the adjacent Duwamish Shipyard site. With expansion to that site, they will have capacity to moor two barges at one time.

The barge transportation companies seek to keep their barges in service. However, there is a shortage of moorage for barges that aren't in service.

FISHING INDUSTRY

Commercial fishing has long been an important sector in the local economy. Seattle is the service center for the Northern Pacific fishing fleet. Salmon, pollock, cod, halibut, and crab are the primary species harvested in Washington and Alaska coastal waters. While the vessels spend much of their time at sea, the vessels use Seattle as a homeport for service and repair, provisioning, and in many cases offloading product for processing.

MAJOR USERS

The largest companies in the industry are integrated with both harvesting and processing operations. These companies operate catcher processors and processing motherships. Harvesting is also provided by their own vessels as well as independent vessels. Much of the product is frozen at sea. The major companies in this area are Trident, American Seafoods, Icicle Seafood, Ocean Beauty and Peter Pan. Other major vessel types and fisheries include halibut and cod longliners, and crabbing vessels. Smaller vessels participate in Alaskan salmon fishing.

Headquarter offices for fishing companies are located in office buildings throughout the Seattle area. The fleets themselves are also moored throughout the area. The large processing vessels are often moored at Terminal 91 or the Maritime Industrial Center on the Ship Canal, and at Fishermen's Terminal. Many of the companies do not have permanent moorage for their vessels and moor them on a short-term basis at shipyards, facilities like Ballard Oil, and other docks in the area. Peak moorage needs are in the spring and late fall.

INDUSTRY TRENDS

The American Fisheries Act of 1998 reshaped the structure of the fishing industry in the Alaskan ground fishery. The major provisions of the Act were to require 75% minimum ownership of vessels; allocation of the catch among motherships, offshore and onshore processors; buyout of catcher and catcher processor vessels; setting of Individual Fish Quotas (IFQ); and provision for fisheries cooperatives. The result of the Act has been to reduce the size of the fleet, but also protect the health of the resource and the quality of the product. The West Coast fisheries will be increasingly quota-shared as well.

Generally, the fisheries that the Seattle fleet participates in are considered to be the best managed and the resources are considered to be quite healthy.

INDUSTRY OUTLOOK

Participants in the Alaska fisheries are optimistic about the future. With the rationalization of the industry, it's possible to plan and invest in improvements in methods and equipment. At the same time, fishing is considered to be a mature industry, with limited opportunities for exceptional growth.

LAND AND FACILITY USE

The facility needs of the fishing companies are quite diverse. American Seafoods has offices in downtown Seattle, with leased moorage at Terminal 91. Trident Seafoods leases office space on the Ship Canal, owns shipyard facilities in Seattle and Tacoma, and operates processing plants in Seattle and Anacortes. Aleutian Spray is seeking permits to develop a headquarters complex on Lake Union with offices, moorage, and warehouse space. Ocean Beauty has processing, office and moorage facilities at their site on the Ship Canal, but representatives indicate that they no longer need to be on the waterfront. There is no consensus on the need for a waterfront location, co-location of functions, or geographic location.

FISH PROCESSING AND COLD STORAGE

MAJOR USERS

Seafood processing has shown strong growth as an industry in the state as shown in Table 6. However, there has been a decline in the number of processors on waterfront sites in Seattle. Of the major fishing companies in Seattle, only Ocean Beauty has a processing facility on the water, and representatives indicate that they don't need to be on the water and would move if they could sell their property. Royal Seafood on Elliott Bay and Wards Cove on Lake Union both closed their facilities and their sites have been redeveloped. Some processors have chosen to move to inland sites in places like Redmond and Monroe.

Table 6
Gross Business Income Trends
Seafood Products

	Seafood Canning	Fresh & Frozen Seafood Processing	Total
1994	$191,701,715	$702,465,312	$894,167,027
1995	270,491,143	933,923,044	1,204,414,187
1996	265,621,884	960,490,124	1,226,112,008
1997	304,523,160	883,931,297	1,188,454,457
1998	240,204,380	777,559,892	1,017,764,272
1999	259,343,205	853,078,477	1,112,421,682
2000	325,241,075	915,418,295	1,240,659,370
2001	381,592,761	1,037,127,390	1,418,720,151
2002	383,468,121	1,119,604,219	1,503,072,340
2003	316,377,458	1,197,493,149	1,513,870,607
2004	291,315,417	1,540,869,222	1,832,184,639
2005	290,621,477	1,143,891,529	1,434,513,006
2006	270,436,894	1,689,291,134	1,959,728,028
2007	315,462,679	1,890,417,552	2,205,880,231
2008	364,295,099	1,954,970,619	2,319,265,718
Avg. Ann. Growth	4.7%	7.6%	7.0%

Source: Washington Department of Revenue, *Quarterly Business Review.*

The number of cold storage facilities has declined as well, with Rainier Cold Storage vacating its aging facility at Terminal 25. Other facilities in the area continue to operate, including Seafreeze at Terminal 115, City Ice at Terminal 91, SCS Refrigerated Services on the Duwamish, and Nordic Cold Storage near Qwest Field.

INDUSTRY TRENDS

As presented in the earlier table, seafood processing has shown strong growth in the state as a whole. There are several trends that affect the demand for waterfront land. First, product continues to be shipped directly from Alaska or through Seattle via containers, and isn't processed here. China has captured a significant amount of primary processing. Second, with less product offloaded at the dock, it is cost-effective to process at less expensive inland locations. On the positive side, there are opportunities for growth in specialty processing. Further, while only a portion of the seafood that is processed at a facility may come over the dock; the fish company may want to consolidate the product from several sources at a single processing location.

OUTLOOK

The seafood industry is considered a mature industry, and any growth will be limited to the expansion of selected facilities.

LAND AND FACILITY USE

Of the four processing companies that we talked to, Trident Seafood expressed interest in expanding their processing facilities in the future. The other companies either don't have processing facilities on the Seattle waterfront or could relocate elsewhere.

SHIPYARDS AND SHIP REPAIR

MAJOR USERS

The shipyard and ship repair businesses vary considerably in the Seattle area in terms of size and capability. Major companies such as Todd, Lake Union Drydock, and Foss have their own drydocks and/or graving yards. Several smaller yards have marine railways or travel lifts.

Shipyards and their drydock capacities are summarized in the table below.

Name	Location	Drydocks	Capacity (tons)
Todd	Harbor Island	3	48,000
Lake Union Drydock	Lake Union	3	4,500
Foss	Ship Canal	3	2,000
Pacific Fisherman	Ship Canal	1	600
Stabbert Maritime	Ship Canal	1	1,100

Source: Company websites; Marine Exchange of Puget sound Pacific Northwest Ports Handbook 2008

INDUSTRY TRENDS

With a few exceptions, the shipyard/ship repair sector in the local area has been declining during the past decade. Two long-term, prominent shipyards in Seattle, Marco and Duwamish Shipyard, closed in recent years. Marco shut down operations in 2005 following a prolonged slump in the fish vessel building business. As new regulations created an oversupply of fishing boats and equipment, work shifted to tugboat construction and repair work on existing vessels. Duwamish Shipyard, which specialized in overhauls of barges, tugboats, and fishing vessels, closed in 2007, leaving Todd Shipyards as the only industrial shipyard along the Duwamish waterway. Todd has experienced cyclical business and employment in the past decade, but has been on an upswing in recent years. The company has substantial work underway or scheduled constructing ferries for Washington State, and additional projects for the Navy and Coast Guard. Kvichak Marine Industries, which manufactures aluminum vessels, also reports growth with numerous federal contracts in hand with Homeland Security and other agencies.

In the ship repair/maintenance realm, yacht refit, conversion and repair services have been growing led by firms such as Stabbert Maritime and Salmon Bay Marine Center, the latter redeveloping the former Marco site on the Ship Canal. Most other businesses that have traditionally focused on repair/maintenance of fishing vessels, tugboats and other

craft have experienced reduced workloads due to decline of the fishing industry and foreign competition. Smaller companies in the pleasure craft segment reported stable operations until the recent economic recession.

Table 7
Gross Business Income Trends
Ship Building and Repair

	Ship Building and Repair	Boat Building	Total
1994	$168,472,080	$289,372,741	$457,844,821
1995	201,049,517	367,675,610	568,725,127
1996	225,227,167	391,509,280	616,736,447
1997	219,845,120	421,122,669	640,967,789
1998	193,411,545	446,387,687	639,799,232
1999	269,821,119	522,736,759	792,557,878
2000	270,017,223	570,561,074	840,578,297
2001	239,883,584	502,899,599	742,783,183
2002	274,299,746	586,989,727	861,289,473
2003	260,046,079	669,670,246	929,716,325
2004	332,693,024	1,085,409,212	1,418,102,236
2005	426,853,291	1,018,947,959	1,445,801,250
2006	348,517,558	1,184,200,018	1,532,717,576
2007	420,321,506	1,294,036,562	1,714,358,068
2008	494,118,719	1,193,406,792	1,687,525,511
Avg. Ann. Growth	8.0%	10.7%	9.8%

Source: Washington Department of Revenue, *Quarterly Business Review.*

INDUSTRY OUTLOOK

The outlook for the industry is mixed, with large established firms like Todd and Foss anticipating growth due to state and federal work, while other companies face uncertain futures due to decline in the fishing industry and out-of-area competition. The yacht segment is a growing segment, although employment needs are significantly lower than historical shipbuilding manpower requirements.

LAND AND FACILITY USE

Consolidation in the Seattle area has somewhat reduced excess capacity which prevailed in the 1990s, although minimal expansion of existing shipyards is expected. Cost of new facilities is significant due to long permitting times and substantial environmental regulations.

SHIP EQUIPMENT/SUPPLY/SERVICE

MAJOR USERS

Ship equipment businesses are typically smaller firms providing engines, generators, propellers, deck machinery, cranes, and electronic components. Many of these businesses are not located on the waterfront, but deliver and install their products at shipyards or dockside. Major firms include Northern Lights, Sound Propeller Services, Cascade Machinery and Electric, and Lindmark Machine Works.

Ship supply and service businesses are purveyors of fuel, maritime supplies, bilge cleaning services, etc. Firms like Ballard Oil on the Ship Canal and Rainier Petroleum on Harbor Island offer service at their docks or by fuel barge. Most equipment, supply, and service companies are located in relatively close proximity of the Ship Canal or Duwamish waterway.

INDUSTRY TRENDS

Local ship equipment firms experienced robust business operations in recent years (prior to the recession) fueled by shipbuilding activity. Sound Propeller reports a significant portion of their business has been due to boat-building in the Gulf area and expansion/rebuilding of older fleets in the Midwest. The Alaskan trade, fishing industry, and Hawaiian exports have all helped bolster Seattle companies.

INDUSTRY OUTLOOK

Concern exists regarding future business volume, since the current recession has impacted the shipbuilding industry. Tighter financing and greater competition are cited as challenges facing ship equipment firms.

LAND AND FACILITY USE

Ship equipment businesses are typically not located on the water as their products are transported by truck. Nonetheless, most are positioned near the water as their primary customers occupy shoreline locations, and close proximity to their clients is an advantage. Although challenges exist in regard to truck access and traffic congestion, expansion of current sites and facilities are not planned in the near term due mainly to uncertain business volume in the future.

HARBOR SERVICES

MAJOR USERS

Harbor services include pilotage, tugboat assistance, and environmental response. Major tugboat companies include Crowley and Olympic Tug on Harbor Island and Foss and

Western Towboat on the Ship Canal. NRC Environmental provides environmental response services.

INDUSTRY TRENDS

The major trends in this sector are the increase in ship size and regulation. With larger vessels, there are fewer ships and larger tugs required.

With increasing attention to potential environmental consequences, the level of resources and the sophistication of response efforts have increased.

Several businesses in this sector were displaced in the past when the Port expanded Terminal 18 on Harbor Island. Most of these businesses have relocated within the area.

INDUSTRY OUTLOOK

Harbor Service activities are directly related to the amount of large vessel traffic in the area. Container freight volumes are projected to experience strong growth rates, but the size of vessels is growing as well. The amount of vessel traffic will not change significantly. The State of Washington has funded the operation of an emergency escort tug at Neah Bay since 1999. Beginning in 2010, the funding of that tug will be the responsibility of the marine industry. While the major oil companies have sought to eliminate or reduce the tanker escort requirement for modern tankers, the requirement remains for two escort vessels east of Port Angeles.

LAND AND FACILITY USE

Businesses in this sector are generally satisfied with their sites and have no needs for expansion.

INTERMODAL

MAJOR USERS

Intermodal users include the intermodal yards, container freight stations and warehouses, container storage and repair, and central examining stations. In addition to on-dock intermodal yards at the Port's terminals, Burlington Northern/Santa Fe operates the Seattle International Gateway (SIG) yard north of Spokane Street, and Union Pacific operates the Argo yard south of Spokane Street just east of the study area. MacMillan Piper is the Northwest's largest container freight station operator and has four locations in this area. Many container freight stations in the area are located in industrial areas away from the waterfront. Northwest Container Services moves containers between Portland and Seattle via truck and rail. Con Global provides container storage at a site at East Marginal Way.

INDUSTRY TRENDS

As described under marine transportation, intermodal freight transportation represents 70% of the Port's container volume and will continue to grow. With that growth, all subsectors will grow as well, even with growth in on-dock intermodal. The SIG and Argo rail yards will continue to be heavily utilized. Sometimes there are not enough rail cars to handle all on-dock volumes, and the containers can be cleared and consolidated at the off-dock yard. Even when cars are available, it is necessary to store or stage cars off-dock.

Currently, the gates at the container terminals are open only during the day, thereby limiting the movement of containers from the terminals. With longer gate hours the effective capacity of the terminals could be increased.

INDUSTRY OUTLOOK

The outlook for intermodal mirrors the outlook for container activity in general, with long-term growth rates similar to cargo volumes generally.

LAND AND FACILITY USE

With growth in intermodal traffic, there will be needs for expansion throughout the sector. This does not need to be provided near the terminal. Additional warehouse and container freight station capacity will be required. These facilities are served by truck and can be located away from the water but preferably nearby.

CONSTRUCTION AND RESOURCES

MAJOR USERS

Manson Construction and General Construction, both located on the Duwamish, represent marine construction companies in the area with waterfront sites used to store and load barges and cranes. Such companies are involved in building piers, bridges, breakwaters, seawalls, and marinas, as well as dredging operations. Resource firms produce and distribute cement, concrete, aggregate, and similar construction materials. Most of these companies are also located primarily on the Duwamish and include LaFarge, Ashgrove Cement, and Glacier Northwest. Salmon Bay Sand and Gravel and Lakeside Industries are positioned adjacent to the Ship Canal.

INDUSTRY TRENDS

Manson Construction reports business has increased 10% annually in recent years as they gain a larger share of the market. Marine construction in general has been healthy, with some recent drop off resulting from the recession.

Resource companies like Lafarge, which brings in cement by barge or ship, has experienced stable business volume over the past five years, with a decline during the

most recent year in concert with the economic recession affecting most businesses. For the most part, business activity of resource companies varies with general construction activity in the region.

INDUSTRY OUTLOOK

Level business volumes are anticipated in the construction and resource industries, with government work providing some stability.

LAND AND FACILITY USE

Construction firms indicate their Duwamish locations are good in terms of waterfront and shore transportation access as well as proximity to customers, although upland area size is inadequate in some cases. Expanded operations and larger equipment are forcing firms to seek more upland area.

RECREATION/MARINA

MAJOR USERS

Prominent marinas in the Seattle area mooring primarily recreational boats include Marina Mart, Salmon Bay Marina, Shilshole Bay Marina, Elliott Bay Marina, Seattle Boat Company, and Jacobson Terminals.

INDUSTRY TRENDS

Occupancy among local marinas has generally remained high, particularly at close-in locations such as Lake Union and the Ship Canal. A slight increase in vacancy has accompanied the economic recession during the past year. Cost increases and subsequent increases in moorage rates have driven some users out of the Seattle area. Dry stacking facilities have multiplied, particularly along the north end of Lake Union and the western end of the Ship Canal. Capabilities of such facilities are limited as sailboats and larger powerboats cannot be accommodated.

Table 8
Recreational Boat Registration Trends
Washington 1998–2007

		% Growth
1998	249,968	—
1999	250,606	0.3%
2000	257,625	2.8%
2001	260,335	1.1%
2002	266,717	2.5%
2003	265,717	-0.4%
2004	266,056	0.1%
2005	267,793	0.6%
2006	270,627	1.1%
2007	270,789	0.1%
Avg. Annual Growth		**0.9%**

Source: National Marine Manufacturers Association, *2008 Recreational Boating Statistical Abstract.*

INDUSTRY OUTLOOK

Stable operations are forecasted by most marina owners due to the lack of developable sites locally and boat owners' desire for quick access. The increase in dry stack facilities could capture demand from in-water facilities.

LAND AND FACILITY USE

The limited number of vacant or redevelopable sites, as well as permit/development regulations have restricted the increase in the supply of in-water moorage. These same factors as well as the increased cost of land have encouraged the development of dry stack boat storage. Historic lack of large yacht slips has led to new facilities, although this is small segment of moorage market.

PASSENGER AND OTHER WATER-DEPENDENT USES

MAJOR USERS

This sector includes passenger transportation and such water-dependent uses as government and research. Major passenger facilities are located on Elliott Bay and Lake Union, providing cruise and sightseeing services in the Puget Sound area as well as Alaska and British Columbia.

Major passenger facilities are located at:

Terminal 91 (Smith Cove):	Cruise Ship Terminal – Two ship berths
Pier 66 (Bell Street Pier):	Cruise Ship Terminal – One ship berth
Pier 69:	Victoria Clipper (Passengers only)
Pier 55:	Argosy Cruises (Also operates out of Lake Union)
Pier 52:	Washington State Ferry (Passengers and Cars)

Examples of government vessels include the Coast Guard (Pier 36) and the Seattle Fire Department, while the National Oceanographic and Atmospheric Administration (NOAA), operating out of Lake Union, represents a research vessel facility. NOAA recently announced plans to move their operations to Newport, Oregon.

INDUSTRY TRENDS

The cruise ship industry in Seattle has grown substantially since the late 1990s. In 1999, six vessel trips transported a total of 6,600 passengers. In 2004, 148 vessel trips transported 562,000 passengers, following the addition of two additional cruise berths. In 2009, a total of 218 vessel trips are scheduled with a total passenger count estimated at more than 800,000. The industry's growth is attributed to economies of scale associated with larger ships which has resulted in price reductions and made cruises affordable to more people. In addition, demographics, specifically the baby boomer surge, has led to increased passenger counts.

Table 9
Cruise Passenger Volume Trends
1993–2008

Year	Total Passengers
1993	10,820
1994	13,887
1995	9,518
1996	10,398
1997	7,152
1998	8,783
1999	6,615
2000	119,002
2001	170,495
2002	244,905
2003	345,000
2004	563,000
2005	686,357
2006	751,000
2007	780,593
2008	886,039

Source: Port of Seattle Records.

Major developments in the local cruise industry include the opening of the Smith Cove Cruise Terminal (Terminal 91) on the north end of Elliott Bay in April 2009. Cruise lines operating out of Smith Cove as well as Pier 66 are summarized as follows:

Name	Departure Location	Destination
Celebrity Cruises	Pier 66	Alaska and Pacific NW
Holland America Line	Terminal 91	Alaska
Norwegian Cruise Line	Pier 66	Alaska
Princess Cruises	Terminal 91	Alaska
Royal Caribbean	Terminal 91	Alaska

The estimated local economic impact of the cruise industry in 2008 includes $312.5 million in annual business revenue, $16.1 million in annual state and local taxes, and 3,781 jobs.

Argosy Cruises has 11 vessels ranging in size from 35 to 280 lineal feet operating in Elliott Bay, the Ship Canal, Lake Union, and Lake Washington. They offer public and private sightseeing tours and host weddings, corporate events, and community activities on their vessels. Business grew steadily between 2004 and 2007, before dropping off in 2008 and drastically declining in 2009. The tourist business has remained stable, but charter/corporate entertainment business is down sharply due to the economic recession. Argosy also operates the water taxi service between Elliott Bay and West Seattle for King

County, and took over Tillicum Village in 2009, a Native cultural experience/dinner on Blake Island.

Victoria Clipper operates three vessels providing passenger service between Seattle, Friday Harbor, and Victoria. Vessels range from 114 to 132 lineal feet and carry passenger loads of 239 to 330. Car ferry service previously offered by the company is no longer available; passengers with cars now utilize the Washington State ferry from Anacortes to Sydney, British Columbia, or the Coho ferry out of Port Angeles to Victoria.

INDUSTRY OUTLOOK

Continued growth in the passenger transportation sector is anticipated in the future, particularly in the large cruise ship segment. Size efficiencies resulting in price declines is expected to draw more passengers in the coming years.

LAND AND FACILITY USE

Terminal 91 and Pier 66 can accommodate growth in the large cruise ship segment, and with improvements to the passenger terminals, they can meet many of the land side needs as well. Additional parking capacity will be necessary as this sector expands and passenger totals increase. Although the majority of passengers are transported to the departure/arrival terminals by buses, shuttles, and taxis, parking space for passengers' private vehicles is an ongoing need.

Concerns exist among the cruise operators in regard to future efficiency and adequacy of passenger loading/unloading when the Alaska Way Viaduct is replaced. A tunnel and periphery development could impact the amount of local parking capacity, as well as bus loading zones, that consequently have an effect on the passenger industry business.

LAND SUPPLY-DEMAND ANALYSIS

Future demand for water-dependent and water-related uses can be compared to the estimated supply of waterfront land to identify whether there are surpluses or deficits that can be addressed by provisions in the Shoreline Master Program. The supply-demand comparison is presented in this section along with a discussion of issues that affect the comparison or should be considered in evaluating the results.

SUPPLY OF WATERFRONT LAND

Estimates of the supply of waterfront land are derived from a land use inventory prepared by City staff in 2006. The methods and findings of the inventory were documented in a report, *Seattle's Shorelines Today and Tomorrow.* The results were used to identify changes since a previous inventory in 1982; and to identify current land use, public access, historic and archeological resources, transportation infrastructure, and public utilities.

Data for the inventory were obtained through field surveys, aerial photography, and informal interviews. The inventory addresses 4,294 parcels. An electronic database was created, providing a wealth of information for the current analysis. Key items used in this analysis are summarized below.

- "Water-dependent use" means a use or portion of a use which cannot exist in a location that is not adjacent to the water and which is dependent on the water by reason of the intrinsic nature of its operations.

- "Water-related use" means a use or portion of a use which is not intrinsically dependent on a waterfront location but whose economic viability is dependent on a waterfront location because:

    a) The use has a functional requirement for a waterfront location such as arrival or shipment of materials by water or the need for large quantities of water; or

    b) The use provides a necessary service supportive of the water-dependent uses and the proximity of the use to its customers makes its services less expensive and/or more convenient.

- "Water enjoyment use" means a recreational use or other use that facilitates public access to the shoreline as a primary characteristic of the use, or a use that provides for recreational use or aesthetic enjoyment of the water for a substantial number of people.

While the first two designations above are the focus of this analysis, the inventory has four other possible designations for a parcel: Floating Home, Park, Non-Water-Dependent, Vacant.

SHORELINE SECTIONS

Fourteen geographical areas are designated as shown in Figure 1, including:

Central Waterfront
Duwamish (Harbor Island and Terminals 5, 25 and 30)
Elliott Bay 1 (including Terminal 91)
Elliott Bay 2 (including Terminal 46)
Elliott Bay 3 (east of Duwamish Head)
Green Lake
Lake Union
Lake Washington
Portage Bay
Puget Sound Central (Ship Canal to Smith Cove)
Puget Sound North (north of Shilshole)
Puget Sound South (west of Duwamish Head)
Shilshole
Ship Canal

SITE TYPES

Dry Waterfront – areas landward of ordinary high water (OHW) mark, and not separated from the water by street, arterial, highway, rail right-of-way.

Upland – areas landward of OHW which are separated from the water.

Submerged Waterfront – areas waterward of OHW.

USE TYPES

Eighty-two land use types were used to designate the primary, secondary, and other uses on the site. The data identify whether there is more than one use, but don't break out the area by uses. However, 89% of sites had one use; 98% had one or two, and 99.5% had three or fewer designated uses. For purposes of the analysis, the current use and demand factors are based on the primary use designated for each parcel in the inventory.

The relationships between water dependency and site type are summarized in Table 10. Land and water area total 314 million square feet or 7,200 acres. Dry waterfront represents 51% of total land and water area, while uplands and submerged areas represent 14% and 35% respectively. Water-dependent and water-related uses represent 95.5 million square feet of land and water area, while 78.9 million square feet are in non-water-dependent or water-related, and 31.2 million square feet of land and water area are vacant. Only 5.3 million square feet of dry lands are vacant.

The relationship between site type and shoreline sector is summarized in Table 11. The largest zone in terms of land and water area is Lake Washington, followed by Duwamish, Puget Sound Central, Puget Sound South, Puget Sound North, and Ship Canal.

Figure 1: Shoreline Land Use Sections

The data are further broken out by shoreline section, dependency designation, and site type in Appendix 2.

Table 10
Shoreline Inventory 2006
Summary of Dependency Designation and Site Type
(Square Feet)

	Dry Waterfront	Uplands	Total Land	Submerged	Total Land & Water
Water Dependent	54,711,578	1,216,116	55,927,694	29,253,640	85,181,334
Water Related	8,522,623	592,971	9,115,595	1,239,971	10,355,565
Water Enjoyment	-	-	-	-	-
Park	56,316,973	16,552,081	72,869,054	35,865,098	108,734,152
Floating Home	175,532	5,500	181,032	1,122,633	1,303,665
Non WD	37,088,121	22,549,390	59,637,511	17,943,845	77,581,356
Vacant	2,996,408	2,295,270	5,291,678	25,933,231	31,224,909
	159,811,235	43,211,328	203,022,564	111,358,418	314,380,981

Table 11
Shoreline Inventory 2006
Site Type Designation and Shoreline Section
(Square Feet)

	Dry Waterfront	Uplands	Total Land	Submerged	Total Land & Water
Central Waterfront	132,594	888,517	1,021,111	2,421,425	3,442,536
Duwamish	41,441,222	1,102,151	42,543,374	10,164,104	52,707,478
Elliott Bay 1	3,614,985	1,395,090	5,010,075	4,076,088	9,086,163
Elliott Bay 2	4,193,002	11,844	4,204,846	1,001,253	5,206,098
Elliott Bay 3	211,135	193,335	404,469	905,085	1,309,554
Green Lake	2,920,533	4,441,439	7,361,972	504	7,362,476
Lake Union	3,242,486	2,448,476	5,690,963	5,718,276	11,409,239
Lake Washington	57,673,432	10,717,628	68,391,060	19,716,264	88,107,324
Portage Bay	3,511,549	1,140,958	4,652,507	2,656,059	7,308,566
Puget Sound Central	19,170,313	1,121,254	20,291,567	27,046,260	47,337,827
Puget Sound North	2,884,282	10,953,567	13,837,849	6,558,636	20,396,484
Puget Sound South	11,376,181	4,339,426	15,715,607	20,659,287	36,374,893
Shilshole	1,610,919	1,811,495	3,422,414	5,673,052	9,095,466
Ship Canal	7,828,603	2,646,149	10,474,751	4,762,128	15,236,879
Total	159,811,235	43,211,329	203,022,564	111,358,419	314,380,984

The relationship between land uses is summarized in Table 12. The land use categories selected are those that are intuitively water-dependent and water-related, and also those that were classified in the inventory as primarily water-dependent or water-related. As shown, the total land and water area is 84 million square feet. This total is approximately 10 million square feet less than the total shown in Table 10. The difference is primarily related to the following sectors that are excluded.

General Office	5.0 million square feet
Railroads, Transit, Streets	1.3 million square feet
Cargo Airport	1.5 million square feet
Governmental Services	1.9 million square feet

Of the uses shown in the Table 12, the largest current uses are Container Marine Shipping, Recreational Marinas, Education (primarily University of Washington), Non-Container Shipping, and Stone/Clay/Glass.

Table 12
Shoreline Inventory 2006
Summary of Water-Dependent and Water-Related Land Uses
(Square Feet)

	Dry Waterfront	Uplands	Total Land	Submerged	Total Land & Water
Seafood Products	610,106	-	610,106	78,214	688,320
Petroleum Refining	621,103	-	621,103	178,633	799,736
Stone Clay and Glass	5,030,109	109,535	5,139,643	728,296	5,867,939
Primary Metal	891,243	-	891,243	210,565	1,101,808
Fabricated Metal Marine	13,619	34,405	48,024	32,342	80,366
Commercial Boat Building	11,428	-	11,428	45,054	56,482
Ship Building	1,113,559	-	1,113,559	528,514	1,642,073
Ship Building w/ Drydock	212,452	-	212,452	654,045	866,498
Ship Building w/o Drydock	90,318	-	90,318	135	90,453
Misc. Marine Supply Mfg.	80,303	-	80,303	31,792	112,094
Marine Passenger	1,221,830	-	1,221,830	130,790	1,352,620
Container Marine Shipping	20,727,530	-	20,727,530	2,550,599	23,278,130
Non-Cont. Marine Shipping	2,592,865	741,053	3,333,917	2,615,374	5,949,292
Business Services	2,142,103	489,572	2,631,675	248,331	2,880,006
Contract Construction Marine	134,631	3,935	138,566	104,333	242,899
Education	11,619,902	1,151,097	12,770,999	743,478	13,514,478
Marine Repair or Service	1,379,864	118,405	1,498,270	1,241,351	2,739,621
Marinas Recreational	5,909,176	-	5,909,176	14,706,616	20,615,792
Moorage Non-Res/Comm	64,836	-	64,836	585,418	650,254
Fishing Acivities/Services	632,420	-	632,420	541,998	1,174,418
Total	55,099,397	2,648,002	57,747,398	25,955,881	83,703,279

The use classifications are based on the primary use designated for each parcel in the inventory.

The current use figures are shown by use and shoreline sector in Appendices 3, 4, and 5.

PROJECTED DEMAND FOR WATERFRONT LAND

OVERVIEW

The estimated demand for land and water for water-dependent and water-related uses is derived from applying growth factors for each use sector to the quantity of land in current use by each of the 20 relevant land use categories listed in Table 12. The growth factors are intended to reflect two elements: the growth in activity for each use and the change in

rates of utilization. The utilization rate in turn reflects any unused capacity plus any changes in productivity. For example, in the case of container terminals, terminal operations can increase throughput until terminal capacity is reached, and continue to increase throughput with changes in productivity related to technology. In 2008, the Port of Seattle's container terminals handled the equivalent of 3,200 TEUs per acre, compared to 3,900 TEUs per acre in 2005. The terminals were operating below capacity in 2008. BST, the consultant who prepared the cargo forecasts for Washington Public Ports Association, projects utilization of 7,700 TEUs per acre for Puget Sound terminals by 2030. (In this case, the decision on whether to invest in such technology is a joint one between the Port and terminal operators, and is based on market and financial considerations in addition to purely operational ones.)

The assumptions regarding growth rates and utilization adjustments is subjective in many cases. Where possible, the assumptions are based on third-party projections, but in all cases the assumptions reflect information derived from interviews with users.

ASSUMPTIONS

The assumptions are specific to categories of water-dependent and water-related uses. The relevant categories are discussed below.

MARINE SHIPPING

The projections for marine shipping rely on the *2009 Marine Cargo Forecast* prepared by the Washington Public Ports Association. This report is prepared every five years and is an authoritative source of data on marine cargo trends. The projected growth rates by type of cargo are summarized in Table 13. The geographic area shown is Puget Sound. This growth will be shared among Puget Sound ports, but the growth trends are relevant for Seattle shorelines.

Table 13
Washington Ports Forecast – 2009
Puget Sound Ports
Projected Annual Growth 2007–2030

Containers (TEU's)	4.1%
Breakbulk	
Foreign	1.1%
Domestic	0.6%
Dry Bulk	1.5%
Grain Export	0.3%
Liquid Bulk	0.3%

Source: BST Associates, *2009 Marine Cargo Forecast,* Technical Report.

The strongest growth is projected for containerized cargo, at an average annual rate of 4.1% over the period 2007 through 2030. Growth rates are actually low or negative through 2010, highest through 2020, and falling somewhat thereafter.

Breakbulk is projected to grow at a much lower rate. Much of the freight activity along the Duwamish River and Ship Canal is domestic breakbulk cargo to Alaska.

In the case of containerized cargo, much of the growth in Seattle will be accommodated in the existing terminals. The Port of Seattle has developed much of the suitable property for such use. Further, there is potential for increases in activity at the existing terminals. For purposes of this analysis, the growth in demand for additional land is assumed to be nominal.

The demand for non-containerized land uses is projected to grow at 0.6% per year, the projected rate for domestic breakbulk cargo. Based on our interviews with users, we did not identify much excess capacity in this use category.

SHIPBUILDING AND SHIP REPAIR

This use category has experienced a mixed performance over the past decade. While the value of output has grown throughout the period as shown in an earlier table, several boatyards have gone out of business. The Washington State Department of Employment Security projects employment statewide in the "other transportation equipment" sector to decline by 2.1% per year from 2007 to 2012 and increase at only 0.5% per year between 2012 and 2017. Our interviews with users generally indicated growth outlook from "going out of business" to "solid future."

For purposes of this analysis, we project a long-term growth rate of 0.3% per year, reflecting continued activity in government work and tugboats. We project a similar rate for marine repair and services.

FISHING AND FISH PROCESSING

The outlook for the local fishing industry is generally considered to be stable. The Seattle-based fishing industry is involved largely in the Alaska fisheries and to a lesser extent the Washington coastal waters. The key fisheries, particularly groundfish, are considered to be the best-managed fisheries. The resource is managed on a sustainable basis, and the participants well established. The size and makeup of the fleet isn't likely to change.

The processing sector is somewhat less certain. Increasingly, raw product is shipped to Asia for primary processing. In some cases it is returned to this country for secondary processing. Most participants indicate that the only prospects for growth are niche markets and specialty processing.

Some companies have moved their processing operations off the waterfront since the amount of product offloaded at the dock is minor. Other companies indicate that even though more than one-half of the product might arrive at the plant by truck, it is convenient to process all product at a waterfront location.

For purposes of this analysis, we project that there will continue to be demand for waterfront sites for the fishing industry and fish processors, but that there will not be growth.

CONSTRUCTION AND RESOURCE ACTIVITY

Marine construction activity has been strong in recent years, particularly with large transportation projects. While there is likely to be additional major government construction projects, our interviews indicated that the outlook was flat. Department of Employment Security employment projections estimate growth in the general construction sector to be 0.7% per year between 2007 and 2012. For this analysis, we used a rate of 0.6% to reflect the cautious outlook of users.

The resource users on the waterfront are primarily sand and gravel and concrete companies. The resource itself is part of the dry bulk commodity group. While this cargo type is projected to grow at 1.5% per year, it includes various other commodities. It's unlikely that the resource uses will grow any faster than the construction sector. We apply a 0.6% growth rate to this use as well.

PASSENGER TRANSPORTATION

This category includes cruise vessels, ferries, and sightseeing vessels. The largest user is the Port's cruise ship terminals at Pier 66 and Pier 91. Cruise activity grew at explosive rates from 11,000 passengers in 1993 to 890,000 in 2008. With the opening of the Terminal 91 facility, the Port greatly increased its capacity. The potential for further growth isn't clear at this time. It is assumed that the existing facilities are adequate to support future growth, and that the effective growth rate in land demand is nominal.

RECREATIONAL MOORAGE

Recreational boating generally, and the demand for vessels and moorage, is closely tied to the state of the economy. When the economy is strong, boat sales are strong and demand for moorage increases. When the economy is distressed, boat sales decline significantly, and smaller vessels are often taken out of the water and stored in back yards. As presented earlier, boat registrations in Washington increased at an average rate of 0.9% per year from 1998 to 2008. Trends in boat registration and moorage indicate that there is increasing demand for larger slips. At the same time, many smaller boats are being stored on land in dry stacked facilities. Current economic conditions will likely suppress demand for many years to come. The overall growth in demand is likely to fall short of the historical growth rate. For purposes of this analysis, we use a growth rate of 0.6% per year.

INSTITUTIONAL

The major institution on the waterfront is the University of Washington and its research and recreational activities. The University has plans and policies in place for its waterfront properties. The University intends to phase out its non-water-dependent uses and replace them with oceanography and fisheries uses. The overall growth in demand for University waterfront land will not change.

BUSINESS SERVICES

Business services generally have grown at a rate greater than the general economy. This is likely to be true for services to marine businesses as well. Business services employment in the State are projected to grow at a rate of 2% for Washington State, while employment as a whole is projected to grow at a rate of 1%.

Given the modest growth rates projected for marine businesses as a whole, a growth rate for marine-related business services is assumed as 1% per year.

COMPARISON OF PROJECTED SUPPLY AND DEMAND

The growth in demand for water-dependent and water-related uses is summarized in Table 14. The land demand projections are compared to available land supply by shoreline sector and land type in Table 15. The land demand is calculated as the sum of demands across uses. The increased demand by use is shown in more detail in Appendices 6, 7 and 8. The supply totals are shown for vacant land and non-water-dependent land.

Table 14
Projected Increase in Water-dependent and Water-related Land and Water Demand
2008 to 2030
(Square Feet)

	Dry Waterfront		Uplands		Submerged Lands	
	Current Use	Growth 2008-2030	Current Use	Growth 2008-2030	Current Use	Growth 2008-2030
Seafood Products	610,106	-	-	-	78,214	-
Petroleum Refining	621,103	-	-	-	178,633	-
Stone Clay and Glass	5,030,109	707,527	109,535	15,407	728,296	102,441
Primary Metal	891,243	-	(0)	-	210,565	-
Fabricated Metal Marine	13,619	928	34,405	2,344	32,342	2,203
Commercial Boat Building	11,428	779	-	-	45,054	3,069
Ship Building	1,113,559	75,857	-	-	528,514	36,003
Ship Building w/ Drydock	212,452	14,473	-	-	654,045	44,554
Ship Building w/o Drydock	90,318	6,153	-	-	135	9
Misc. Marine Supply Mfg.	80,303	5,470	-	-	31,792	2,166
Marine Passenger	1,221,830	-	-	-	130,790	-
Container Marine Shipping	20,727,530	-	-	-	2,550,599	-
Non-Cont. Marine Shipping	2,592,865	364,708	741,053	104,235	2,615,374	367,874
Business Services	2,142,103	524,206	489,572	119,806	248,331	60,771
Contract Construction Marine	134,631	18,937	3,935	554	104,333	14,675
Education	11,619,902	-	1,151,097	-	743,478	-
Marine Repair or Service	1,379,864	93,998	118,405	8,066	1,241,351	84,562
Marinas Recreational	5,909,176	831,175	-	-	14,706,616	2,068,608
Moorage Non-Res/Comm	64,836	9,120	-	-	585,418	82,344
Fishing Acivities/Services	632,420	-	-	-	541,998	-
Total	55,099,397	2,653,329	2,648,002	250,411	25,955,881	2,869,280

Table 15
Comparison of Supply and Demand by Shoreline Sector
2008–2030
(Square Feet)

	Duwamish	Ship Canal	Lake Union	Portage Bay	All Zones
Primary Uses	Resources Business Services Non Cont. Shipping Recreational Marina Ship Building	Recreational Marina Business Services Non Cont. Shipping Marine Repair Commercial Moorage	Recreational Marina Ship Building Commercial Moorage Business Services Marine Repair	Recreational Marina	
Demand 2008 to 2030					
Dry Waterfront	1,563,848	575,195	169,590	38,289	2,653,329
Uplands	65,519	50,378	21,930		250,411
Submerged Lands	303,706	475,470	453,920	165,265	2,869,280
Total	1,933,073	1,101,043	645,440	203,554	5,773,020
Vacant Land					
Dry Waterfront	1,019,333	10,606	3,082	17,660	2,996,408
Uplands	-	31,834	155,328		2,295,270
Submerged Lands	2,077,832	6,116	24,884	87,290	25,933,231
Total	3,097,165	48,556	183,294	104,950	31,224,908
Non-Waterdependent Use Land					
Dry Waterfront	8,553,863	1,373,966	624,785	444,178	37,263,653
Uplands	811,776	2,201,909	1,918,208	1,132,666	22,554,890
Submerged Lands	416,359	69,324	1,091,770	540,156	19,066,478
Total	9,781,998	3,645,199	3,634,763	2,117,000	78,885,021

The key findings of the comparison are the following:

- There are several areas in which the demand for land for water-dependent and water-related uses exceeds the amount of vacant land. In particular, the projected demand for total Dry Waterfront, Uplands and Submerged land in Ship Canal, Lake Union, and Portage Bay all greatly exceed the amount of total vacant land. The demand for Dry Waterfront land in the Duwamish also exceeds the amount of vacant land.

- While the total projected growth in demand for land and water in the shoreline zone of 5.8 million square feet is less than the total amount of vacant land and water, the demand in certain sections is not transferrable to other shoreline sections.

- There is far more land in non-water-dependent or water-related use than the projected increase in demand. However, it's not clear from the inventory, the extent to which the non-water-dependent or non-water-related uses are susceptible to change to alternative uses. In particular, it's not clear which of those lands could be acquired at an affordable price.

- Further, there are secondary uses on many waterfront sites that are not water-dependent or water-related. According to our interviews with representatives of selected marine businesses, 10% to 20% of the activity on many of their sites is non water-dependent or water-related. The land for these uses could be utilized if demand for the primary use justified expansion.

- The individual vacant parcels may not be appropriate in size or offer required adjacencies to meet the needs of the water-dependent and water-related uses. For this reason, the amount of suitable vacant land is overstated.

- Finally, projected sea level rise could significantly reduce land supply for water-dependent/water-related businesses. Even in conservative projections, Harbor Island and portions of the Duwamish industrial area are likely to be inundated. Not only will this decrease the supply of land for potential expansion, it is likely to displace existing uses

There are additional issues that are difficult to incorporate explicitly into the supply and demand analysis but should be understood in preparing policies for the Master Plan update.

1. How does land price affect demand, and how do restrictions on use affect price?

2. How are the uses interrelated, and are there uses which are important to support the water-dependent and water-related uses?

Each of these questions is considered in the remainder of this section

EFFECT OF LAND PRICES

It's impossible to separate the concept of demand from price. By definition, demand represents a quantity at a specified price. The demand analysis in this study implicitly assumes that price levels are effectively unchanged over the forecast period. Land prices reflect pressures for competing uses. To what extent will these pressures affect the demand by water-dependent and water-related uses? The issue of industrial land price impacts was addressed in a report by Property Counselors on *Economic Impacts of Seattle Industrial Area Zoning Changes* in May 2008. The specific issue in that report was the impact of increased restrictions on commercial uses in industrial zones.

Previous analyses by City staff had documented a pattern of industrial land prices in Seattle that were generally stable from 1982 through 2000, with rapid increases thereafter. The analysis in the 2008 report focused on the period 1998 to early 2008. There were 65 industrial-zoned land sales (IG-1 and IG-2) in South Seattle and Interbay during this period, as reported by Co-Star. The average sale prices increased by 60% in IG-1 zones in South Seattle to approximately $26.00 per square foot. There were too few sales to draw definitive conclusions in the Ballard/Interbay areas. Price increases were modest, although the average prices of Ballard/Interbay IG-2 lands are $30.00 to $45.00 per square foot. The small number of sales in IG-2 zones in South Seattle obscures any trends.

Ten specific sales were analyzed in Interbay and South Seattle during the period 2004 to 2008. Of the 10 sales, only one was based on an intended industrial use. Five sales were acquired for commercial purposes, with development plans vested. These sales were relatively older, but the land price per square foot was higher than the average sale price in the Seattle area.

These results are directly relevant to the current demand projections.

1. The growth in industrial land prices isn't particularly dramatic if only properties intended to be developed for industrial uses are considered.

2. The properties intended to include commercial uses, either because they were allowed outright or were vested, reflect higher prices related to the ability of some non-industrial uses to pay more.

For purposes of this study, the conclusions mean that:

- It's not unreasonable to make demand projections that assume stable prices, and

- Any changes in allowable uses could invalidate that assumption.

These findings are consistent with evidence from our interviews. Property owners expressed concern that restrictions on use have limited their ability to market their property. At the same time, businesses indicated that rents and taxes were jeopardizing their ability to remain profitable. Both arguments are true, as property owners and user businesses have economic interests that sometimes are in conflict. The strength of demand is relatively modest; not all underutilized properties meet the specific needs of expanding marine business; and property owners may find few potential tenants for their sites. At the same time, those businesses that are located on non-industrial zoned sites may well be experiencing pressures on rents.

MUTUALLY SUPPORTIVE USES

Many people we interviewed talked about the importance of the marine business cluster, particularly in Ballard Interbay, but along the Duwamish as well. All the goods and services that a business might require are available in the nearby community. The fishing industry is centered in Ballard Interbay at least partly because of the local business infrastructure. If those goods and services weren't available, other port cities with lower land prices would become more attractive. While many of these businesses are not water-dependent or water-related, their location affects water-dependent and water-related businesses.

The interrelationship of these businesses is quantified in the Washington Input Output Model 2002. The supply chain for the Fishing Industry, Water Transportation and Ship and Boat Building were summarized in a report *Seattle's Maritime Cluster* prepared for Seattle Office of Economic Development by Paul Sommers of Seattle University in March 2009. The top 10 supply industries for each industry are shown in Table 16.

The largest purchases for the three activities combined are transportation services, petroleum products, financial services, and various products supplied by wholesalers.

Table 16
Top 10 Supply Industries for Washington

	% of All Purchases
Supply Chain for the Fishing Industry	
Petroleum Products	22.5%
Construction	17.6%
Wholesale	14.3%
Credit Intermediation and Related Activities	9.5%
Waste Management/Other, and Agriculture Services	4.5%
Truck Transportation	4.3%
Other Finance and Insurance	4.2%
Ship and Boat Building	2.7%
Legal/Accounting and Bookkeeping/Management Services	2.7%
Educational Services	2.4%
Total	**100.0%**
Supply Chain for Water Transportation	
Support Activities for Transportation, Warehousing and Storage	20.4%
Other Transportation/Postal Offices	15.5%
Other Finance and Insurance	13.0%
Waste Management/Other, and Agriculture Services	11.8%
Real Estate and Rental and Leasing	8.7%
Administrative/Employment Support Services	6.5%
Fabricated Metals	4.6%
Ship and Boat Building	3.7%
Legal/Accounting and Bookkeeping/Management Services	3.5%
Telecommunications	2.1%
Total	**100.0%**
Supply Chain for Ship and Boat Building	
Wholesale	14.3%
Retail	12.0%
Legal/Accounting and Bookkeeping/Management Services	8.0%
Machinery Manufacturing	7.3%
Credit Intermediation and Related Activities	6.9%
Waste Management/Other, and Agriculture Services	5.6%
Construction	5.4%
Administrative/Employment Support Services	4.8%
Other Information	4.5%
Other Finance and Insurance	3.9%
Total	**100.0%**

These results match the responses we received in our interviews. More specifically, interviewees talked about the importance of:

Material Suppliers
Repair Services
Tugboats
Crane Operators
Grocery Suppliers
Hardware Stores
Yacht Brokers
Restaurants
Finance and Insurance
Machine Shops
Fuel
Harbor Assistance
Government Agencies
Cold Storage

Land use policies that encourage these types of businesses to locate near the waterfront will benefit marine industries as a whole.

FINDINGS AND RECOMMENDATIONS

The analysis presented in the previous sections supports several key findings and associated recommendations.

CONCLUSIONS

1. Adequacy of Land Supply to Meet Future Demand for Water-Dependent and Water-Related Uses

The amount of vacant submerged and dry waterfront land is greater in total than the projected increase in demand for the period 2008 to 2030. However, the comparison doesn't reflect three significant market realities:

- The vacant land may not be in the correct location to meet the needs of an expanding business.
- The vacant land may not be available at a supportable price.
- The vacant land may not match the size and condition requirements of potential users.

One hundred acres of land supply may not be enough to accommodate 100 acres of aggregate demand. Often, a market factor can be applied to increase the nominal demand to account for these factors. For example, a market factor of 1.25 would indicate that 125 acres of land supply would be required to meet 100 acres of aggregate demand.

2. Adequacy of Land in Specific Geographic Areas

While the vacant land supply appears adequate in total, it falls well short of projected demand in Duwamish, Lake Union, Portage Bay, and Ship Canal. The increased demand in Portage Bay and Lake Union is primarily related to recreational moorage. The increased demand in Duwamish is due to resource industries, marine shipping, and business services, while the increase in demand in the Ship Canal is due to recreational moorage, marine repairs, and business services. The geographic areas with vacant land generally aren't ideally suited to the growing uses, either because of lack of weather protection for recreational moorage, or the non-industrial character for resource uses and marine transportation.

In order for the increased demand to be met in these areas, existing non-water-dependent or water-related uses would have to be redeveloped. While there may be developed sites that are susceptible to redevelopment, economics generally won't support the replacement of a revenue-producing non-water-dependent use with a new water-dependent use, particularly one with special facility requirements.

3. Conversion of Waterfront Sites to Non-Water-Dependent or Water-Related Uses

Conversion of waterfront sites to non-water-dependent or water-related uses will exacerbate the deficit of land for water-dependent and water-related uses. However, there are non-water-dependent and non-water-related uses that are important to the local marine community. If those uses could be accommodated in addition to, but not in place of water-dependent and water-related uses, there would not be a loss of the dependent and related uses, and there would be benefits to the local economy.

4. Restrictions on Uses

Restrictions on permitted uses relieve pressure on water-dependent and water-related businesses in two ways: they reduce the competition for specific sites, and they reduce pressure for general land price increases. However, the subset of non-water-dependent and non-water-related uses that are an important part of the marine community could be treated differently.

5. Assistance in Meeting Regulatory Requirements

Development and operation in the waterfront environment is subject to review by a variety of regulatory agencies. In the course of our interviews, we spoke to several water-dependent users who were interested in expanding their businesses. The regulatory process is daunting with development approvals requiring five years or more. In a world where these users are already facing economic pressures, this outlook can discourage expansion of their uses. It's important that regulations that are intended to protect water-dependent and water-related uses not impede their ability to expand. While the City is just one of the jurisdictions with authority over the process, it should evaluate its role.

RECOMMENDATIONS

1. The City should continue to restrict the development of non-water-dependent and water-related uses in the shoreline zones to assure that suitable dry and submerged lands are available for water-dependent and water-related uses.

2. Allow non-water-dependent and water-related uses that are important parts of the supply chain for marine businesses to locate within the shoreline zone, but not as a primary use.

3. Facilitate the expansion or development of water-dependent and water-related uses by reducing, wherever possible, the period necessary to secure permits.

APPENDICES

Appendix 1. List of Persons Interviewed

Appendix2. Summary of Supply by Type and Zone (Square Feet)

Appendix 3. Current Use by Zone, Dry Waterfront (Square Feet)

Appendix 4. Current Use by Zone, Uplands (Square Feet)

Appendix 5. Current Use by Zone, Submerged Lands (Square Feet)

Appendix 6. Projected Growth 2008-2030, Dry Waterfront (Square Feet)

Appendix 7. Projected Growth 2008-2030, Uplands (Square Feet)

Appendix 8. Projected Growth 2008-2030, Submerged Lands (Square Feet)

Appendix 9. Demand Supply Comparison by Zone (Square Feet)

APPENDIX 1: LIST OF PERSONS INTERVIEWED

Marine Terminal

Eric Hanson	Port of Seattle
Peter/Elliot Strong	Coastal Transport
Barry Hachler	Northland Barge

Fishing/Fish Processing/Cold Storage

Bob Alverson	Fishing Vessels Owners
Tony Ross	Ocean Beauty
Jim McManus	Trident Seafood
Jan Jacobs	American Seafood
Chris Swason	Aleutian Spray
Kim Suelzle	City Ice

Shipbuilding/Repair

Carl Miller	Miller and Miller
Peter Proctor	Jensen Motor Boat
Brian Thomas	Kvichak Marine
Paul Torrey	Todd Pacific Shipyard
Doug Dixon	Pacific Fisherman
Jim Francis	Lake Union Drydock
Andy Stevens	Foss Shipyard
Ron Pauley	Stabbert Yacht

Ship Supply/Service

Warren Aakervik	Ballard Oil
Tom Delius/	Seattle Marine Supply
Larry Repman	Northern Lights

Harbor Services

Rick Shrewsbury	Western Towboat
Jim Reidell	NRC Environmental
Dave Hill	Foss Maritime
Margie Freeman	Fremont Tugboat
Brad Roberson	Rainier Petroleum

Intermodal

Steve Stivala	McMillan Piper
Art Scheuneman	Northwest Container
Kent Christopher	Western Ports Transp.
Jimmy Banks	Con Global

Construction/Resources

Mike Shaw	General Construction
Pat McGarry	Manson Construction

Passenger Terminal

Kevin Clark	Argosy Cruise
Marie Fritz	Port of Seattle

Recreational Moorage

Greg Youell	Hidden Harbor Yachts
Chuck Draper	Salmon Bay Marina
Brooke Stabbert	Salmon Bay Marine Ctr.
Martin Nelson	Marina Mart
Jake Beattie	Ctr. For Wooden Boats

Commercial Vessel Moorage

Jim Ferguson	Ferguson Terminal
Scott Pattison	Port of Seattle
Kenny Lyles	Port of Seattle
Brian Jacobson	Jacobson Terminals

Institutional

Jan Arntz	Univ. of Washington

Other

Marty Oppenheimer	Friends of Street Ends
Bob Allison	Property Owner
Cyrilla Cook	People for Puget Sound
Vince O'Halloran	Sailor's Union of Pacific
Bob Bowman, et al.	Floating Homes Assoc.

APPENDIX 2. SUMMARY OF SUPPLY BY TYPE AND ZONE (SQUARE FEET)

Dry Waterfront	Central Watefront	Duwamish	Elliott Bay 1	Elliott Bay 2	Elliott Bay 3	Green Lake	Lake Union	Lake Washington	Portage Bay	Puget Sound Central	Puget Sound North	Puget Sound South	Shilshole	Ship Canal	Grand Total
Water Dependent	112,985	22,319,984	1,857,872	4,082,470	141,153	-	1,718,359	14,974,553	2,280,276	400,243	-	78,936	691,653	6,053,093	54,711,577
Water Related	-	8,341,801	-	-	-	-	21,671	-	-	-	-	-	50,655	108,496	8,522,623
Water Enjoyment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Park	-	1,206,242	328,669	-	-	2,920,533	874,590	28,580,971	769,434	14,313,243	990,845	6,050,005	-	282,441	56,316,973
Floating Home	-	-	-	-	-	-	17,871		157,220		-	-	-	441	175,532
Non WD	19,609	8,553,863	1,350,447	110,531	68,041	-	606,914	13,273,919	286,958	3,876,487	1,857,557	4,863,285	846,984	1,373,525	37,088,120
Vacant	-	1,019,333	77,996	-	1,941	-	3,082	843,989	17,660	580,341	35,880	383,955	21,626	10,606	2,996,409
Total	132,594	41,441,223	3,614,984	4,193,001	211,135	2,920,533	3,242,487	57,673,432	3,511,548	19,170,314	2,884,282	11,376,181	1,610,918	7,828,602	159,811,234
Uplands															
Water Dependent	-	27,257	741,053	-	-	-	78,761	346,234	-	-	-	-	-	22,811	1,216,116
Water Related	-	158,147	-	-	-	-	39,989	-	8,292	-	-	-	3,481	383,064	592,973
Water Enjoyment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Park	78,213	104,972	122,198	-	43,098	4,086,315	256,190	2,620,122	-	546,259	7,448,717	1,022,775	216,689	6,531	16,552,079
Floating Home	-	-	-	-	-	-	-	-	5,500	-	-	-	-	-	5,500
Non WD	810,304	811,776	437,892	11,844	131,865	355,124	1,918,208	7,195,426	1,127,166	459,917	2,642,214	2,873,532	1,572,214	2,201,909	22,549,391
Vacant	-	-	93,947	-	18,372	-	155,328	555,846	-	115,077	862,635	443,119	19,112	31,834	2,295,270
Total	888,517	1,102,152	1,395,090	11,844	193,335	4,441,439	2,448,476	10,717,628	1,140,958	1,121,253	10,953,566	4,339,426	1,811,496	2,646,149	43,211,329
Submerged Lands															
Water Dependent	1,251,374	3,798,742	2,943,085	674,896	218,882	-	4,380,802	2,868,867	1,527,315	2,965,137	-	374,043	3,639,967	4,610,531	29,253,641
Water Related	-	1,161,924	-	-	-	-	66,962	-	-	-	-	-	-	11,085	1,239,971
Water Enjoyment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Park	189,416	2,709,247	38,848	-	-	504	153,857	8,774,164	501,299	14,306,334	2,064,473	6,708,810	353,073	65,072	35,865,097
Floating Home	-	-	-	-	-	-	726,513	-	385,956	-	-	-	-	10,164	1,122,633
Non WD	564,988	416,359	14,725	326,356	20,958	-	365,257	7,323,015	154,200	562,742	584,135	7,213,898	338,052	59,160	17,943,845
Vacant	415,647	2,077,832	1,079,430	-	665,244		24,884	750,217	87,290	9,212,047	3,910,027	6,362,535	1,341,961	6,116	25,933,230
Total	2,421,425	10,164,104	4,076,088	1,001,252	905,084	504	5,718,275	19,716,263	2,656,060	27,046,260	6,558,635	20,659,286	5,673,053	4,762,128	111,358,417
Total Land and Water															
Water Dependent	1,364,359	26,145,983	5,542,010	4,757,367	360,036	-	6,177,922	18,189,654	3,807,591	3,365,379	-	452,980	4,331,620	10,686,435	85,181,336
Water Related	-	9,661,871	-	-	-	-	128,622	-	8,292	-	-	-	54,136	502,645	10,355,566
Water Enjoyment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Park	267,629	4,020,461	489,716	-	43,098	7,007,352	1,284,638	39,975,257	1,270,734	29,165,836	10,504,036	13,781,591	569,761	354,044	108,734,153
Floating Home	-	-	-	-	-	-	744,384	-	548,676	-	-	-	-	10,605	1,303,665
Non WD	1,394,900	9,781,998	1,803,065	448,732	220,864	355,124	2,890,379	27,792,360	1,568,324	4,899,147	5,083,906	14,950,715	2,757,250	3,634,594	77,581,358
Vacant	415,647	3,097,165	1,251,373	-	685,557	-	183,294	2,150,052	104,950	9,907,465	4,808,542	7,189,608	1,382,699	48,556	31,224,908
Total	3,442,535	52,707,478	9,086,164	5,206,099	1,309,555	7,362,476	11,409,239	88,107,323	7,308,567	47,337,827	20,396,484	36,374,894	9,095,466	15,236,879	314,380,986

APPENDIX 3: CURRENT USE BY ZONE, DRY WATERFRONT (SQUARE FEET)

	Central Waterfront	Duwamish	Elliott Bay 1	Elliott Bay 2	Elliott Bay 3	Green Lake	Lake Union	Lake Washington	Portage Bay	Puget Sound Central	Puget Sound North	Puget Sound South	Shilshole	Ship Canal	Grand Total
Seafood Products 20	-	52,628	-	-	-	-	48,204	-	-	-	-	-	-	509,274	610,106
Petroleum Refining 29		621,103													621,103
Stone Clay and Glass 32		4,882,748												147,361	5,030,109
Primary Metal 33		891,243													891,243
Fabricated Metal Marine 34.1	-	-	-	-	-	-	-	-	13,619	-	-	-	-	-	13,619
Commercial Boat Building 37	-	-	-	-	-	-	-	-	-	-	-	-	-	11,428	11,428
Ship Building 38	-	1,113,559	-	-	-	-	-	-	-	-	-	-	-	-	1,113,559
Ship Building w/ Drydock 38.1	-	-	-	-	-	-	116,033	-	-	-	-	-	-	96,419	212,452
Ship Building w/o Drydock 38.2	-	-	-	-	-	-	-	-	-	-	-	-	-	90,318	90,318
Misc. Marine Supply Mfg. 39.1	-	4,463	-	-	-	-	-	-	-	-	-	-	-	75,839	80,303
Marine Passenger 44	-	1,221,830	-	-	-	-	-	-	-	-	-	-	-	-	1,221,830
Container Marine Shipping 50.1	-	16,615,415	-	4,082,470	-	-	-	-	-	-	-	-	-	29,644	20,727,530
Non-Cont. Marine Shipping 50.2	-	1,866,431	535,612	-	-	-	-	-	-	-	-	-	-	190,821	2,592,865
Business Services 63		1,827,231					13,666							301,206	2,142,103
Contract Construction Marine 66.1		60,519												74,112	134,631
Education 68							5,344	9,686,735	1,850,376					77,447	11,619,902
Marine Repair or Service 70	-	429,959	-	-	-	-	102,314	-	-	-	-	-	-	847,592	1,379,864
Marinas Recreational 77	99,597	379,677	-	-	263	-	1,048,848	451,008	265,620	400,243	-	-	691,653	2,572,266	5,909,176
Moorage Non-Res/Comm 78	-	-	-	-	-	-	27,316	-	-	-	-	-	-	37,520	64,836
Fishing Acivities/Services 84	-	83,279	-	-	-	-	21,471	-	-	-	-	-	-	527,670	632,420
Total	99,597	30,050,086	535,612	4,082,470	263	-	1,383,196	10,137,743	2,129,615	400,243	-	-	691,653	5,588,917	55,099,397

APPENDIX 4. CURRENT USE BY ZONE, UPLANDS (SQUARE FEET)

	Central Waterfront	Duwamish	Elliott Bay 1	Elliott Bay 2	Elliott Bay 3	Green Lake	Lake Union	Lake Washington	Portage Bay	Puget Sound Central	Puget Sound North	Puget Sound South	Shilshole	Ship Canal	Grand Total
Seafood Products 20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Refining 29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stone Clay and Glass 32	-	109,535	-	-	-	-	-	-	-	-	-	-	-	-	109,535
Primary Metal 33	-	(0)	-	-	-	-	-	-	-	-	-	-	-	-	(0)
Fabricated Metal Marine 34.1	-	21,194	-	-	-	-	-	-	-	-	-	-	-	13,211	34,405
Commercial Boat Building 37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ship Building 38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ship Building w/ Drydock 38.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ship Building w/o Drydock 38.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Marine Supply Mfg. 39.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Marine Passenger 44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Marine Shipping 50.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-Cont. Marine Shipping 50.2	-	-	741,053	-	-	-	-	-	-	-	-	-	-	-	741,053
Business Services 63	34,117	191,288	-	-	-	-	89,615	-	-	-	-	-	-	174,552	489,572
Contract Construction Marine 66.1	-	-	-	-	-	-	-	-	-	-	-	-	-	3,935	3,935
Education 68	128,307	-	-	-	-	-	143,394	-	717,755	-	-	-	-	161,640	1,151,097
Marine Repair or Service 70	-	27,257	-	-	-	-	-	-	-	-	-	-	-	91,148	118,405
Marinas Recreational 77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moorage Non-Res/Comm 78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fishing Acivities/Services 84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	162,425	349,274	741,053	-	-	-	233,009	-	717,755	-	-	-	-	444,487	2,648,002

APPENDIX 5. CURRENT USE BY ZONE, SUBMERGED LANDS (SQUARE FEET)

	Central Waterfront	Duwamish	Elliott Bay 1	Elliott Bay 2	Elliott Bay 3	Green Lake	Lake Union	Lake Washington	Portage Bay	Puget Sound Central	Puget Sound North	Puget Sound South	Shilshole	Ship Canal	Grand Total
Seafood Products 20	-	5,607	-	-	-	-	5,994	-	-	-	-	-	-	66,613	78,214
Petroleum Refining 29	-	178,633	-	-	-	-	-	-	-	-	-	-	-	-	178,633
Stone Clay and Glass 32	-	717,211	-	-	-	-	-	-	-	-	-	-	-	11,085	728,296
Primary Metal 33	-	210,565	-	-	-	-	-	-	-	-	-	-	-	-	210,565
Fabricated Metal Marine 34.1	-	-	-	-	-	-	-	-	32,342	-	-	-	-	-	32,342
Commercial Boat Building 37	-	-	-	-	-	-	-	-	-	-	-	-	-	45,054	45,054
Ship Building 38	-	528,514	-	-	-	-	-	-	-	-	-	-	-	-	528,514
Ship Building w/ Drydock 38.1	-	-	-	-	-	-	581,627	-	-	-	-	-	-	72,418	654,045
Ship Building w/o Drydock 38.2	-	-	-	-	-	-	-	-	-	-	-	-	-	135	135
Misc. Marine Supply Mfg. 39.1	-	-	-	-	-	-	-	-	-	-	-	-	-	31,792	31,792
Marine Passenger 44	-	130,776	-	-	-	-	-	-	-	-	-	-	-	13	130,790
Container Marine Shipping 50.1	-	1,863,969	-	674,896	-	-	-	-	-	-	-	-	-	11,734	2,550,599
Non-Cont. Marine Shipping 50.2	-	157,905	2,226,682	-	-	-	-	-	-	-	-	-	-	230,787	2,615,374
Business Services 63	-	211,357	-	-	-	-	12	-	-	-	-	-	-	36,963	248,331
Contract Construction Marine 66.1	-	93,237	-	-	-	-	-	-	-	-	-	-	-	11,097	104,333
Education 68	-	-	-	-	-	-	43,533	494,412	168,424	-	-	-	-	37,110	743,478
Marine Repair or Service 70	-	206,666	-	-	-	-	184,143	-	-	-	-	-	-	850,542	1,241,351
Marinas Recreational 77	371,751	442,021	-	-	28,802	-	2,682,474	1,171,567	1,159,275	2,965,137	-	-	3,639,967	2,245,622	14,706,616
Moorage Non-Res/Comm 78	53,485	25,036	-	-	-	-	173,753	-	-	-	-	-	-	333,144	585,418
Fishing Acivities/Services 84	-	126,339	-	-	-	-	12,385	-	-	-	-	-	-	403,274	541,998
Total	425,236	4,897,837	2,226,682	674,896	28,802	-	3,683,921	1,665,979	1,360,041	2,965,137	-	-	3,639,967	4,387,382	25,955,881

APPENDIX 6. PROJECTED GROWTH 2008-2030, DRY WATERFRONT (SQUARE FEET)

	Central Waterfront	Duwamish	Elliott Bay 1	Elliott Bay 2	Elliott Bay 3	Green Lake	Lake Union	Lake Washington	Portage Bay	Puget Sound Central	Puget Sound North	Puget Sound South	Shilshole	Ship Canal	Grand Total
Seafood Products 20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Refining 29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stone Clay and Glass 32	-	686,799	-	-	-	-	-	-	-	-	-	-	-	20,728	707,527
Primary Metal 33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fabricated Metal Marine 34.1	-	-	-	-	-	-	-	-	928	-	-	-	-	-	928
Commercial Boat Building 37	-	-	-	-	-	-	-	-	-	-	-	-	-	779	779
Ship Building 38	-	75,857	-	-	-	-	-	-	-	-	-	-	-	-	75,857
Ship Building w/ Drydock 38.1	-	-	-	-	-	-	7,904	-	-	-	-	-	-	6,568	14,473
Ship Building w/o Drydock 38.2	-	-	-	-	-	-	-	-	-	-	-	-	-	6,153	6,153
Misc. Marine Supply Mfg. 39.1	-	304	-	-	-	-	-	-	-	-	-	-	-	5,166	5,470
Marine Passenger 44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Marine Shipping 50.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-Cont. Marine Shipping 50.2	-	262,529	75,338	-	-	-	-	-	-	-	-	-	-	26,841	364,708
Business Services 63	-	447,152	-	-	-	-	3,344	-	-	-	-	-	-	73,710	524,206
Contract Construction Marine 66.1	-	8,513	-	-	-	-	-	-	-	-	-	-	-	10,424	18,937
Education 68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Marine Repair or Service 70	-	29,289	-	-	-	-	6,970	-	-	-	-	-	-	57,739	93,998
Marinas Recreational 77	14,009	53,405	-	-	37	-	147,529	63,438	37,362	56,297	-	-	97,287	361,811	831,175
Moorage Non-Res/Comm 78	-	-	-	-	-	-	3,842	-	-	-	-	-	-	5,277	9,120
Fishing Acivities/Services 84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	14,009	1,563,848	75,338	-	37	-	169,590	63,438	38,289	56,297	-	-	97,287	575,195	2,653,329

APPENDIX 7. PROJECTED GROWTH 2008-2030, UPLANDS (SQUARE FEET)

	Central Waterfront	Duwamish	Elliott Bay 1	Elliott Bay 2	Elliott Bay 3	Green Lake	Lake Union	Lake Washington	Portage Bay	Puget Sound Central	Puget Sound North	Puget Sound South	Shilshole	Ship Canal	Grand Total
Seafood Products 20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Refining 29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stone Clay and Glass 32	-	15,407	-	-	-	-	-	-	-	-	-	-	-	-	15,407
Primary Metal 33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fabricated Metal Marine 34.1	-	1,444	-	-	-	-	-	-	-	-	-	-	-	900	2,344
Commercial Boat Building 37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ship Building 38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ship Building w/ Drydock 38.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ship Building w/o Drydock 38.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Marine Supply Mfg. 39.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Marine Passenger 44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Marine Shipping 50.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-Cont. Marine Shipping 50.2	-	-	104,235	-	-	-	-	-	-	-	-	-	-	-	104,235
Business Services 63	8,349	46,811	-	-	-	-	21,930	-	-	-	-	-	-	42,716	119,806
Contract Construction Marine 66.1	-	-	-	-	-	-	-	-	-	-	-	-	-	554	554
Education 68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Marine Repair or Service 70	-	1,857	-	-	-	-	-	-	-	-	-	-	-	6,209	8,066
Marinas Recreational 77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moorage Non-Res/Comm 78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fishing Acivities/Services 84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	8,349	65,519	104,235	-	-	-	21,930	-	-	-	-	-	-	50,378	250,411

APPENDIX 8. PROJECTED GROWTH 2008-2030, SUBMERGED LANDS (SQUARE FEET)

	Central Waterfront	Duwamish	Elliott Bay 1	Elliott Bay 2	Elliott Bay 3	Green Lake	Lake Union	Lake Washington	Portage Bay	Puget Sound Central	Puget Sound North	Puget Sound South	Shilshole	Ship Canal	Grand Total
Seafood Products 20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Refining 29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stone Clay and Glass 32	-	100,882	-	-	-	-	-	-	-	-	-	-	-	1,559	102,441
Primary Metal 33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fabricated Metal Marine 34.1	-	-	-	-	-	-	-	-	2,203	-	-	-	-	-	2,203
Commercial Boat Building 37	-	-	-	-	-	-	-	-	-	-	-	-	-	3,069	3,069
Ship Building 38	-	36,003	-	-	-	-	-	-	-	-	-	-	-	-	36,003
Ship Building w/ Drydock 38.1	-	-	-	-	-	-	39,621	-	-	-	-	-	-	4,933	44,554
Ship Building w/o Drydock 38.2	-	-	-	-	-	-	-	-	-	-	-	-	-	9	9
Misc. Marine Supply Mfg. 39.1	-	-	-	-	-	-	-	-	-	-	-	-	-	2,166	2,166
Marine Passenger 44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Container Marine Shipping 50.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-Cont. Marine Shipping 50.2	-	22,211	313,201	-	-	-	-	-	-	-	-	-	-	32,462	367,874
Business Services 63	-	51,722	-	-	-	-	3	-	-	-	-	-	-	9,045	60,771
Contract Construction Marine 66.1	-	13,115	-	-	-	-	-	-	-	-	-	-	-	1,561	14,675
Education 68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Marine Repair or Service 70	-	14,078	-	-	-	-	12,544	-	-	-	-	-	-	57,940	84,562
Marinas Recreational 77	52,290	62,174	-	-	4,051	-	377,312	164,791	163,062	417,071	-	-	511,992	315,866	2,068,608
Moorage Non-Res/Comm 78	7,523	3,522	-	-	-	-	24,440	-	-	-	-	-	-	46,859	82,344
Fishing Acivities/Services 84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	59,813	303,706	313,201	-	4,051	-	453,920	164,791	165,265	417,071	-	-	511,992	475,470	2,869,280

APPENDIX 9. DEMAND SUPPLY COMPARISON BY ZONE (SQUARE FEET)

	Central Waterfront	Duwamish	Elliott Bay 1	Elliott Bay 2	Elliott Bay 3	Green Lake	Lake Union	Lake Washington	Portage Bay	Puget Sound Central	Puget Sound North	Puget Sound South	Shilshole	Ship Canal	Grand Total
Total Dry Waterfront															
Projected Demand Growth	14,009	1,563,848	75,338	-	37	-	169,590	63,438	38,289	56,297	-	-	97,287	575,195	2,653,329
Supply															
Vacant	-	1,019,333	77,996	-	1,941	-	3,082	843,989	17,660	580,341	35,880	383,955	21,626	10,606	2,996,408
Non Water Dependent	19,609	8,553,863	1,350,447	110,531	68,041	-	624,785	13,273,919	444,178	3,876,487	1,857,557	4,863,285	846,984	1,373,966	37,263,653
Uplands															
Projected Demand Growth	8,349	65,519	104,235	-	-	-	21,930	-	-	-	-	-	-	50,378	250,411
Supply															
Vacant	-	-	93,947	-	18,372	-	155,328	555,846	-	115,077	862,635	443,119	19,112	31,834	2,295,270
Non Water Dependent	810,304	811,776	437,892	11,844	131,865	355,124	1,918,208	7,195,426	1,132,666	459,917	2,642,214	2,873,532	1,572,214	2,201,909	22,554,890
Submerged Lands															
Projected Demand Growth	59,813	303,706	313,201	-	4,051	-	453,920	164,791	165,265	417,071	-	-	511,992	475,470	2,869,280
Supply															
Vacant	415,647	2,077,832	1,079,430	-	665,244	-	24,884	750,217	87,290	9,212,047	3,910,027	6,362,535	1,341,961	6,116	25,933,231
Non Water Dependent	564,988	416,359	14,725	326,356	20,958	-	1,091,770	7,323,015	540,156	562,742	584,135	7,213,898	338,052	69,324	19,066,478
Total Land and Water															
Projected Demand Growth	82,171	1,933,073	492,775	-	4,088	-	645,440	228,229	203,554	473,369	-	-	609,278	1,101,043	5,773,020
Supply															
Vacant	415,647	3,097,165	1,251,373	-	685,557	-	183,294	2,150,052	104,950	9,907,465	4,808,542	7,189,608	1,382,699	48,556	31,224,908
Non Water Dependent	1,394,900	9,781,998	1,803,065	448,732	220,864	355,124	3,634,763	27,792,360	2,117,000	4,899,147	5,083,906	14,950,715	2,757,250	3,645,199	78,885,021