

Seattle's Maritime Cluster: Characteristics, Trends and Policy Issues

Report for the Seattle Office of Economic Development

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Executive Summary

The City of Seattle's Office of Economic Development commissioned this report to analyze the Maritime Industry in Seattle, an industry selected for its accessible, family-wage job base and its competitive strength in the region.

This study includes the wide range of businesses that are included in, and provide services to, the Maritime Industry in Seattle. The Maritime Industry is called out separately in this report, and is also included in a broader Basic Industries report, which includes all of the industrial jobs in Seattle.

This study relied on many business leaders in the cluster, as well as government statistical employment data. These sources provided the following data:

- **Maritime Employment and Wages:** Across Seattle, the Maritime Cluster employed 22,129 individuals in 2002. These jobs paid an average wage of nearly \$70,000.
- **Business Revenues:** Seattle's Maritime businesses (477 in total), generated nearly \$2.1 billion in output (similar to revenue) in 2002.
- **Multiplier Effects:** When multiplier effects are considered, the Maritime Cluster employed 45,324 across King County, and generated \$4.1 billion in revenues.
- **Key Areas of Concern for Industry Leaders.** Through focus groups and surveys, business leaders indicated the following concerns (which are highlighted in greater detail in the body of the document):
 - Regulatory Pressures
 - Overlapping Environmental Regulations
 - Myriad Fishing Regulations and Rationalization
 - B&O Tax
 - Land use/ Lack of Protection of Industrial Land
 - Lack of Master Plan for the Waterfront
 - Redevelopment of the SODO District
 - Burke Gilman and Other Bike Trails
 - Construction Permits and the Department of Planning and Development
 - Port Access and the Lack of Grade Separation
 - Transportation Inefficiencies and Lack of Affordable Housing
 - Lack of Funding for the Operations of Washington State Ferries

- Market Pressures
 - Aquaculture
 - Railroad Access and Pricing
- **Ideas for City Involvement to Help Support the Maritime Cluster.**

Business leaders suggested the following items for City of Seattle involvement to promote and grow this cluster:

 - Appoint a public/private maritime industry liaison.
 - Streamline and simplify the permit process.
 - Create more efficient environmental regulatory practices.
 - Develop a master plan for the port that will improve outcomes for the maritime cluster.
 - Protect low land rents in industrial areas.
 - Continue to work with other transportation agencies on transportation infrastructure improvement projects like the FAST Corridor Project.
 - Re-route the Burke Gilman bike path in the Ballard area, and take the needs of businesses into account when making new routing decisions.
 - Promote a Viaduct replacement project that will increase the efficiency of transporting goods between the Ballard and the Duwamish Corridor.
 - Protect industrial and manufacturing zones from mixed use redevelopment.
 - Rethink policy that promotes public access to the waterfront at the expense of business access to the waterfront.
 - Promote trade through the Port of Seattle.
 - Promote tourism.

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Project Background

Cluster Theory

This report was prepared with the framework of an industry cluster as suggested by Michael Porter, Stuart Rosenfeld, and other leading scholars. Porter says that:

Clusters are geographic concentrations of interconnected companies, specialized suppliers, service providers, and associated institutions in a particular field... Clusters arise because they increase the productivity with which companies can compete.¹

Project Design

A Maritime Steering Committee of key industry representatives that serve Seattle's Maritime cluster helped advise this study (see Appendix I for the list of Maritime Steering Committee members). A survey and a series of focus groups were used to assess the business situation of the maritime cluster and the views of cluster members concerning major issues affecting the viability and future prospects of these industries.

A mail survey was conducted of maritime businesses in Seattle during August and September 2003. A total of 70 survey responses was received. The survey form, with a summary of quantitative responses, is provided in Appendix VIII of the report.

Focus groups were held with seven different groupings of cluster members, ranging from the owners of companies operating deep draft and shallow draft vessels, to marine construction and tug/tow operators, marine equipment suppliers, and marine business services. The purpose of the focus groups was to:

- understand the competitive state and business outlook of the sub-cluster as well as the maritime cluster more generally
- identify specific issues the sector currently faces
- determine how these issues might be addressed by the city of Seattle.

Upper level management and experts from at least one business within each of these sub-clusters was invited to participate. Each focus group meeting was attended by 6 to 12 participants and the semi-structured meetings lasted about two hours.

Data Sources and Limitations

Data for this study were derived from several sources, including government statistics, a survey of maritime companies, focus groups with various components of the cluster, and prior studies dealing with portions of the cluster.

¹ <http://www.isc.hbs.edu/econ-clusters.htm> (October 2003).

Assessing the economic impact of the maritime cluster requires some complicated arithmetic necessitated by the interconnections among components of the cluster using an input-output model. The multiplier calculations in the input-output model capture the impacts of the maritime industries on other industries that supply goods or services to these industries. Input-output models estimate the multiplier impact of a particular industry that brings in income from outside the region. These models are based on survey data concerning inter-industry production relationships. For example, if more cars are required, more output is required from the metal and rubber sectors, which in turn require more vehicles to haul their supplies, which necessitates further increases in metal and rubber output. Input-output models capture this series of relationships through the concept of multipliers. In addition, the model captures the impact of the payrolls of the industries as these payrolls translate into purchases of goods and services by local households. It should be noted that the input-output model for this report includes economic impact for all of King County, not just Seattle information.

Some data were difficult to derive. In particular, the fishing industry employment and wages are very difficult to estimate since compensation takes the form of crew and vessel owner shares of the catch, and the value of the catch brought home by Seattle-based vessels is not tracked by any reporting agency and must be estimated as an uncertain proportion of the catch landed in the major fishery in the Gulf of Alaska. The wages cited in this study do not include the earnings of self-employed fishing vessel owners. Existing data collection systems simply do not support the construction of definitive estimates. For example, a Port of Seattle survey of vessels moored in Fisherman's Terminal shows a larger number of fish vessel employees than reported later in this report. This may be due to the common practice of vessel owners using their home addresses as business addresses. The employees on the vessel would then show up at the owner's home address, which could be outside Seattle or even outside King county.

Seattle's Maritime Cluster

Seattle's maritime cluster includes many tightly interconnected industries – fishing and seafood processing, waterborne transportation, ship and boat building and repairing, as well as major support industries including cold storage, marinas, marine terminals, fuel, marine construction, specialized wholesale and retail companies supplying marine equipment and supplies, insurance and law. Each of these sectors is described in greater detail later in the report.

Small, privately-held companies with a long history are typical of this cluster. Over 30 percent of the sales of these firms are to customers outside the state of Washington, making the cluster a strong element in the economic base of the

regional economy. Most of these industries are mature; the cruise ship and recreational sectors, however, have expanded in recent years.

Total Cluster Activity Levels

The maritime cluster in Seattle includes 477 businesses which directly employed 22,129 workers in 2002. This industry pays high wages, averaging nearly \$70,000. Wages range from \$45,000 in boat dealers to \$79,000 in water transportation.

The maritime industry produced an output (similar to revenue) of just under \$2.1 billion per year. The maritime cluster has multiplier impacts on the rest of the local economy resulting from purchases by the maritime industries from other local companies, as well as the payroll spending of both the maritime industries and those impacted by purchases of these industries. Taking the multiplier impact into account, the total impact of the maritime cluster across King County is \$4.1 billion in annual revenues, supporting a county – wide employment base of just under 45,324.

Table 1: Estimated Impact of Maritime Industries in Seattle

	Seattle Output (millions)	Number of Establishments	Seattle Employment	Average Wages
Fishing	\$512	170	1,009	\$74,646
Shipbuilding	\$245	59	2,314	\$76,322
Water Transportation	\$534	127	10,700	\$79,261
Seafood Processing	\$717	57	6,133	\$54,752
Cruise Ship Business	\$75	22	1,622	\$59,227
Boat Dealers/Suppliers	\$11	42	351	\$44,955
Total	\$2,094	477	22,129	\$69,938
Total Impact on King County	\$4,148		45,324	

Geographic Concentration and Waterfront Usage

The maritime cluster is strongly represented along the waterways of the city, including Lake Union, the Lake Washington Ship Canal, Elliott Bay, and the Harbor Island/Duwamish river area. Maritime industries are water dependent businesses requiring a waterfront location, and many of the support industries are located nearby. Vessel owners prefer the Ship Canal and lake marinas due to lower hull maintenance costs associated with a freshwater berth. Currently there are 9,300⁺ maritime workers at 275 worksites located near the waterfront.

Water dependent businesses obviously need a waterfront location to carry out their business. However, many other businesses and residents in Seattle value

the waterfront as an amenity. Nearly 1,200 other employers are doing business in the waterfront zones, with a total employment of almost 24,600. These businesses are in diverse industries pretty much spanning the entire range of industries in the local economy. Waterfront views command high prices for either residential or business use. While zoning and other public policies assist water dependent businesses in a battle to stay on the waterfront, real estate prices for waterfront locations have soared in recent years.

Seattle Competitiveness in Maritime

An analysis of the competitive status of the maritime cluster vis a vis other West Coast cities shows a higher density for the maritime cluster in Seattle than in Los Angeles or the Bay Area. The cluster is larger than in these competitor cities, with a more complete range of core and support industries than the other cities. As a consequence, marine construction, tug/tow operations, and marine business service companies based in Seattle find business opportunities up and down the West Coast. The Puget Sound container shipping industry faces strong competition from other ports.

The strength of the Seattle maritime cluster is seen in the Location Quotients (LQ) in Table 2. LQs are tools used by regional economists to measure regional competitive advantage. LQs measure the relative concentration of a given cluster in a region as compared to the nation. LQs greater than one indicate a local concentration more dense than the national concentration of the industry, evidence of regional competitive advantage. An industry with a high LQ is likely to be an exporter of goods or services to customers outside the region, thereby bringing income into the region.

Seattle (King County) has LQs of 1.5 to 1.9 for shipbuilding, depending on whether the calculation is done using establishment counts, employment levels, or total annual wage payments. LQs in excess of 1 are indicative of competitive advantage in an industry, and Seattle shows considerable strength in shipbuilding. In Los Angeles and Oakland, the comparable LQs are very small, 0.1 to 0.3, indicating a lack of competitive advantage in shipbuilding. In water transportation, the LQs for Seattle are even higher, 4.3 to 8.9, as compared to 0.9 to 1.1 in Los Angeles and 1.2 to 6.2 in Oakland. These comparisons demonstrate that Seattle's economy is uniquely strong and specialized in the maritime cluster, as well as simply having larger employment levels in these industries.

Seattle has the largest and strongest maritime cluster on the west coast, as shown by metropolitan area statistics compiled by the U.S. Department of Labor, Bureau of Labor Statistics. According to BLS, King County, Washington has over 2,000 workers employed in ship building, and over 2,500 in water transportation. By comparison, Los Angeles County in California, home of two major competitors to the Port of Seattle, provides employment to fewer than 400 individuals in shipbuilding at an average wage very close to the industry figure in Seattle, and

1,250 workers in water transportation. Alameda County (the Oakland, California area) has just 82 individuals employed in shipbuilding, and 775 in water transportation. Across the Bay, San Francisco does not show any shipbuilding or water transportation employment at present despite its long history in these industries. Other industries have displaced the maritime cluster that existed in years past in San Francisco.

Table 2: Characteristics of Ship Building and Water Transportation Industries by Region, 2002

County (City)	Industry	LQ- Establishments	LQ- Employment	LQ- Annual Wages	Annual Average Establishment Count	Annual Average Employment	Annual Average Pay
King (Seattle)	Shipbuilding	1.9	1.6	1.5	41	2,043	48,722
	Water Transportation	4.3	8.9	6.8	39	2,563	58,282
	All Industries				83,567	951,346	48,665
Los Angeles (Los Angeles)	Shipbuilding	0.2	0.1	0.1	17	379	42,363
	Water Transportation	1.1	1.2	0.9	38	1,252	50,442
	All Industries				325,999	3,471,930	40,928
Alameda (Oakland)	Shipbuilding	0.3	0.1	0.1	4	82	48,009
	Water Transportation	1.2	4.5	6.2	6	775	100,464
	All Industries				45,607	570,549	46,150

Source: U.S. Department of Labor, Bureau of Labor Statistics, Covered Employment series

Seattle's Strengths

Queries about business conditions revealed modestly favorable views of local business conditions including transportation systems and quality of life; and very favorable views of other cluster members, a tendency to source inputs locally, and at the same time a sense that competition is quite strong in product markets. While some portions of the cluster could relocate to other cities such as Tacoma or Bellingham, most cluster members feel that Seattle is a superior location for their businesses.

Focus group participants indicated that geography plays an important role in establishing the competitive advantage of the maritime cluster. Seattle offers a combination of fresh water berths and deep water access that is unmatched anywhere on the West Coast. It is also closer to Asia and to Alaska than competitive ports, making it a natural location for commerce with these key markets. Geographic advantages include:

- Port of Seattle is buffered from high seas and storms
- Naturally deep waters of the Puget Sound eliminate costly dredging operations
- Vessel access to a freshwater lake

The physical characteristics of the area allow savings to be realized in a number of areas including transportation costs and maintenance costs. Additionally, the longtime maritime presence and the diversity of the maritime-specific goods and services available in the area allow economies of scale and external economies of agglomeration to be realized. Because much of the maritime industry is concentrated in Seattle, businesses realize transportation savings in their operations. It was pointed out by multiple focus groups that Seattle serves as a “one-stop shopping area” for vessels of all types and this is the *single* biggest reason that vessels continue to come here for service.

Key Issues Identified by Industry Leaders

Survey and focus group respondents highlighted a number of key issues they face, primarily from regulatory and market pressures. Nearly all maritime businesses share a high level of frustration. They feel that the needs of the maritime industry are not considered by the City, and they feel that the bureaucracy of the City is difficult and costly to navigate. These issues are highlighted briefly below, and in more depth in the appendix of survey response.

Regulatory Pressures

Environmental

Focus group participants felt that regulatory pressures to maintain or enhance water quality have produced a maze of overlapping and conflicting regulations from many levels of government. These business managers feel that regulators do not have a sense of where the most significant problems are; they pressure

the maritime industries to further reduce what is perceived as nearly negligible pollution from maritime industries while seemingly ignoring runoff from highways and streets. Monitoring of storm water runoff costs both time and money, as does the construction of storm water routing systems. While the federal government sets the standards, it is up to state agencies to enforce them. The particular methods that individual states use to enforce these regulations are not mandated by the federal government which results in multiple systems that unevenly burden businesses.

Myriad Fishing Regulations and Rationalization

The fishing industry is one of the most heavily regulated industries in the U.S. Currently, each fishing vessel must apply for 25 to 30 separate operating permits each year and pay an application fee in order to have each of these processed. Regulations on the industry are severe, expensive, and often involve costly fees and record keeping according to focus group participants.

B&O Tax

Another regulatory pressure felt by the maritime cluster is what is perceived as an onerous B&O tax. Many of the businesses in the maritime cluster work with large volumes and razor thin margins, and therefore have to pay a great deal in taxes compared to the revenues that they gain from their operations.

Land use/ Lack of Protection of Industrial Land

Focus group respondents also felt that land use regulations appear to be administered without regard to impacts on business costs and without making any attempt to coordinate with other agencies. Bicycle trails and condominiums are invading industrial neighborhoods without consideration of liability and insurance issues, or the need of businesses to operate around the clock. The largest conflicts arise when waterfront or near waterfront property is rezoned to residential/mixed use. Due to rezoning, it is also increasingly difficult for land intensive maritime industrial businesses to expand. In addition to a general lack of land upon which the maritime firms can grow, rezoning has driven land rents on waterfront parcels to a level that makes expansion uneconomical.

Lack of Master Plan for the Waterfront

Focus group and survey respondents perceive that the City and the Port do not seem to coordinate policies with each other. There is no current master plan for the waterfront. Many industry members feel they have no workable alternative locations and are concerned by future uncertainty for how waterfront land will be used.

Redevelopment of the SODO District

In addition to losing waterfront property to competing, non-industrial uses, the maritime cluster is threatened by the redevelopment of the SODO district. Mixed-use land use planning allows competing, non-complementary demands to be

created in this former industrial area. Conflicts between trucks, trains, and commuter vehicles arise as traffic congestion increases in the area.

Burke Gilman and Other Bike Trails

Cluster members believe that the choice to run the route along Shilshole Avenue and NW 45th Street could potentially devastate the marine industries located there. Several focus group participants felt that putting a bike trail between their facilities and the nearest arterial will eventually result in a collision between a bicyclist and a delivery truck. Should this happen, these companies' insurance costs would skyrocket to a price that would eventually drive them out of business.

Construction Permits and the Department of Planning and Development

One of the greatest pressures felt by the Shipbuilding and Boatyard sub-cluster and the Marine Construction and Terminal Operations sub-cluster has to do with the permit process for construction projects. Permits for construction along the waterfront are costly, complicated, and tedious to acquire. The general consensus among the focus group attendees is that the city is difficult to work with.

Port Access and the Lack of Grade Separation

Because the Port of Seattle and the harbor are located in such close proximity to downtown Seattle, cargo carriers are faced with overcoming congestion on the access points to the port and the harbor. Industry leaders indicated that many of the grades of roads and railways are not separated in the downtown area, and huge delays occur every day as a result.

Transportation Inefficiencies and Lack of Affordable Housing

One of the most common pressures felt by maritime businesses is traffic congestion. The linkages between maritime businesses necessitate frequent trips between South End facilities and North End facilities, and the 99 Corridor is the route of choice for these trips. For this reason, extreme concern has been expressed over plans to rebuild the aging and damaged Viaduct, and where traffic will be routed during construction. Because of the housing situation, many of the employees – especially the laborers – of the maritime cluster commute from points outside of the city boundary. As traffic congestion builds, maritime businesses are having an increasingly difficult time attracting workers that could otherwise work at manufacturing facilities outside Seattle. To combat this problem, many maritime businesses have changed their hours of operation, but traffic congestion is becoming increasingly difficult to outmaneuver.

Monorail

The final decision on where the proposed monorail will be built could have potentially negative impacts on the maritime cluster. Should the green line to Ballard be erected, the land one shipyard uses will be acquired, and this company will likely go out of business as their location is one of the firm's strategic advantages.

Lack of Funding for the Operations of Washington State Ferries

Due to recent changes in the tax structure, Washington State Ferries have lost some of their funding. This negatively impacts the maritime cluster in two distinct ways. First, less maintenance is required by the ferries as the total number of miles traveled per year decreases. This has a direct impact on the boatyards and the suppliers of marine equipment. Second, fewer new vessels are added to the fleet, and many of the existing vessels were constructed in local shipyards.

Market Pressures

Aquaculture

Increasing competition from fish farms is a market pressure strongly impacting the fishing industry in Seattle.

Railroad Access and Pricing

When considering the movement of cargo through the Port of Seattle, access to and the pricing of rail services must be taken into consideration. Seattle is perceived to be at a considerable disadvantage on both of these fronts.

Suggestions for City of Seattle Involvement

Suggestions for public actions that could improve business conditions for the maritime cluster include the following ideas from focus group participants and survey respondents:

- Appoint a public/private maritime industry liaison.
- Streamline and simplify the permit process.
- Create more efficient environmental regulatory practices.
- Develop a master plan for the port that will improve outcomes for the maritime cluster.
- Protect low land rents in industrial areas.
- Continue to work with other transportation agencies on transportation infrastructure improvement projects like the FAST Corridor Project.
- Re-route the Burke Gilman bike path in the Ballard area, and take the needs of businesses into account when making new routing decisions.
- Promote a Viaduct replacement project that will increase the efficiency of transporting goods between the Ballard and the Duwamish Corridor.
- Protect industrial and manufacturing zones from mixed use redevelopment.
- Rethink policy that promotes public access to the waterfront at the expense of business access to the waterfront.
- Promote trade through the Port of Seattle.
- Promote tourism.

Maritime Cluster Industries

Fishing

The Lake Washington Ship Canal and other waterfront locations in Seattle house a commercial fishing fleet of approximately 230 fishing vessels. The largest concentration of these vessels can be seen during the off season at Fisherman's Terminal in the Ship Canal. Large processing vessels also are part of the fishing fleet. Some of these vessels catch fish by trawling, while others buy fish at sea from fishing vessels and perform some primary processing at sea before delivering the catch to shore-side cold storage facilities, many of them in Seattle.

Prior to each fishing season, vessel owners typically spend upwards of 25 percent of their annual budget of \$1-2 million on repair and maintenance activity that often takes place in local shipyards. They buy fishing gear, bait, groceries and fuel for the trip to the Gulf of Alaska, and often fly crew up to Dutch Harbor to meet the boat. These expenditures account for at least another 25 percent of the vessel's annual budget. When they return to a Seattle berth, local cold storage facilities take delivery of the cargo valued at over \$1 million. The vessel owners also pay for a variety of services including insurance, accounting, consulting, and legal services amounting to about 20% of the annual budget, and crew and skipper/owner shares that account for the remaining 30% of the budget. The crew and skipper shares are a form of wage compensation that is typical in this industry; crew shares in the risk and reward of the fishing enterprise in a way that is usually reserved for owners of a business. This income goes to households located in Seattle (25-50 percent of crew live in Seattle) and surrounding communities, and in turn flows into mortgage and consumer loan payments, grocery stores, clothing and entertainment outlets in the Seattle area.²

Fishing brings in 4.5 to 5 million pounds of seafood each year; a catch usually valued in excess of \$1 billion. Some of the Seattle based vessels fish in the waters off the coast of Washington or Oregon, but most of the vessels make an annual migration to Alaska where the bulk of the fishing is done. Fish caught off Alaska may be processed in shore-side facilities in Alaska or on at-sea processors that also come up from Seattle for the fishing season. Seafood is shipped from these shore-side or floating facilities directly to customers in the U.S. or Asia by air, or iced down and taken by vessel back to Seattle cold storage facilities for later distribution.

The fishing industry is currently undergoing significant structural changes as more and more fisheries are moving from temporal based regulatory control to a quota based system. The process of moving from a temporal based system to a quota system, including buying out excess licenses, is known as "rationalization."

² This example is based on 2002 profit and loss statements of several local fishing companies that were provided to the authors on a confidential basis.

Currently the entire fishing industry is making the move towards rationalization as the dominant form of regulatory control. Rationalization of fisheries by regulatory authorities is expected to reduce the number of operating vessels and surviving fishing companies; it is widely believed that the entire industry will be rationalized in the next 10 years

Water Transportation

Waterborne transportation includes passenger transportation and moving cargo along the west coast of North America, including extensive barge traffic within the Puget Sound and to/from Alaska, and in terminal operations including trans-oceanic cargo. The water transportation industries include vessels transporting manufactured goods and bulk cargos (e.g., grain and petroleum products), as well as passenger transportation vessels including the Washington State Ferries, small local cruise ships and vessel charter companies, and large cruise ships traveling international routes are all included in the waterborne transportation industries.

Deep Draft Vessels

The deep draft vessels sub-cluster includes two distinct types of businesses:

- large international firms that mainly focus on the international delivery of containerized cargo, e.g., the Seattle operations of COSCO (China Ocean Shipping Company), Hanjin, and APL (American President Lines), and
- smaller businesses that focus mainly on the transport and delivery of cargo destined for, or coming from, the Alaskan market, e.g., Crowley, Foss, and Western Towboat.

While these two types of firms have a distinct structure, they share a need for a deep water port that has rail connections to the rest of the country.

Larger International Firms:

The large international shipping businesses are all well established. COSCO has been doing business since 1961. This shipping company was the carrier that delivered the first Chinese goods to the U.S. in April of 1979 after trade negotiations liberalized trade between the U.S. and China. The Port of Seattle was the first port of call on this historic voyage.

The international shipping lines move a large amount of goods through the Port of Seattle, although Seattle's share is small compared the quantity of goods shipped through the combined ports of Los Angeles and Long Beach. The amount of business that goes through Port of Seattle docks depends on a number of factors, including the relative size of local and distant markets that can be served from a given port, and the order of port calls on the west coast. Of the goods that these shippers carry, only 30 percent are destined for the local market which they define as Washington, Oregon, Idaho, Montana, and British Columbia. This is relatively small market compared to Southern California, which serves a large population base. The bulk of the remaining 70 percent of Seattle

traffic is delivered by rail to Chicago, where it is routed to multiple points along the East Coast and in the Midwest. The export side is in a similar state, with the great majority of the exports shipped out of the Port of Seattle arriving from out of state locations.

International containerized cargo carriers have linkages to local stevedoring companies, trucking companies, warehousing companies, and rail companies. Some of these carriers are located locally, while others and their crews for the vessels are foreign. And some of the vessels themselves are built and maintained by foreign shipyards in order to take advantage of lower wage rates and less onerous environmental regulations.

Tug/Tow Operators

The second sub-category of deep draft vessels are the tug/tow operators. Crowley, Foss and Western Towboat transport non-containerized cargo among west coast ports, with the Alaskan market being the primary focus. In addition, these companies also transport oil products via barge from Puget Sound refineries to major distribution centers in the urban area. These companies also provide local transportation services, such as moving aggregates from mines into the urban construction market. Compared to the international cargo carriers, these companies have stronger ties to other maritime businesses in Seattle. Many of these companies build their own vessels and purchase supplies, insurance, and professional services almost exclusively from local vendors. Additionally most of the employees of these companies live in King County although a substantial proportion of them live outside the city of Seattle. These businesses also have strong linkages to the local bunker, fuel, and lubricants providers which are classified in the Marine Equipment sub-cluster. This deep draft vessels subcategory also assist the large container and cruise ships upon entering Puget Sound and help guide them safely to the Port of Seattle terminals.

Both of these categories of deep draft vessels have a great deal of resources tied up in capital investments, and both require access to deep water terminals. Whereas the containerized cargo carriers use the deep water terminals as a place to load and unload containers, the smaller barge companies that service Alaska and the local market also utilize the terminals for longer term moorage for the barges as well as maintenance and construction services.

Shallow Draft Vessels

Another element in the water transportation industry is domestic cargo shipments on smaller vessels and barges. These vessels are often called “shallow draft” vessels within the maritime cluster. Much of this traffic goes between points within the Puget Sound, or to and from Alaska since a majority of goods used by businesses and consumers in Alaska come through Puget Sound ports. Seattle has been known as “Alaska’s wholesaler and grocer” for many decades. A large portion of the Alaskan fish catch is shipped to the Puget Sound and stored in

Seattle cold storage facilities before secondary processing is performed and final products are shipped out to domestic and foreign markets.

An impact study conducted for the Seattle and Tacoma Chambers of Commerce indicates that 3 percent of Puget Sound jobs depend on the two-way trade with Alaska. This study concludes that if Alaska were a separate nation, it would be Washington's third largest export market excluding aerospace exports. A substantial portion of the water transportation industry based in Seattle serves the Alaskan market using barges towed to and from Alaska by local towing companies.³ In addition, smaller ships and tug/barge operations move a variety of "break bulk" cargos including aggregates to cement plants and wood chips to pulp mills.

Cruise Ships

Large cruise ships have added a new element to the waterfront scene in the last several years. About 345,000 passengers visited Seattle during 100 cruise ship calls in 2003 (Table 3), and it is estimated that they spent \$124 million on goods and services during their visits. Another increase is expected this year. These vessels tie up at the Bell Harbor cruise ship terminal and a newer facility south of downtown. Port-of-call passengers shop, eat and drink, and seek shore-side entertainment during their visits. These cruise ship passengers have added a new market to retail businesses in downtown, estimated to generate \$124 million in revenues and \$3.8 million in state and local taxes in 2003.⁴ Smaller cruise ships offer local harbor tours, cruises to Alaska through the Inside Passage, and charter engagements used by many organizations to entertain their employees or clients. No estimates are available of the local purchases for larger and smaller cruise ships, but in addition to paying local moorage fees, these vessels require fuel, parts, provisions for passengers, and other commodities and services purchased locally.

Table 3: Cruise Ship Passengers Visiting Seattle by Year

Year	No. of 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

³ Chase, Robert A. and Glenn Pascall. *Jobs today—jobs tomorrow: The Puget Sound—Alaska partnership*. Report for Tacoma-Pierce County Chamber of Commerce and Greater Seattle Chamber of Commerce, February 1996.

⁴ Fact sheet from Port of Seattle

Source: Port of Seattle

Recreational Boating

Recreational boaters occupy a significant position in the maritime cluster. Their numbers are growing. The 64,000 boat owners in King County represent a substantial market for the more than 800 businesses that serve this consumer market. Other studies estimate that boat owners spend an average of \$3800 to \$5100 per year on their boats.⁵ Applying these estimates to the 64,000 King County registered boat owners implies a recreational boater market with a transaction value of \$244 million to \$328 million annually.

Other businesses serving this market segment include marinas, marine oriented retailers, and on-the-water fuel stations.

Ship Building and Repair

Ship building and repair businesses build new vessels and performing extensive maintenance on existing vessels. Many of the vessels used by the water transportation and fishing industries are built in local ship and boat yards (not including the large deep draft vessels). The medium sized and smaller vessels built in local yards are also maintained locally, and many of the maintenance and repair activities take place in shipyards. One large shipyard with a Harbor Island drydock performs maintenance on large ships that are not built locally. The mid-1990s saw a burst of activity in the local shipyards due to changed regulations on tugboat design that led many companies to build new vessels. As this new fleet came into service, activity in the shipyards has settled down into a new equilibrium based on on-going repair and maintenance activity and a lower rate of new construction to replace older vessels.

The ship and boat yard industry also includes independent craftsmen (known as “tailgaters” or “mobile shipyards” as many operate out of pickup trucks) who carry out repairs and modifications on board vessels. The statistics in this study do not include the tailgaters, most of who are self-employed business persons and are not included in employment statistics. In some ways these two aspects of the shipbuilding/repair industry complement each other by adding flexibility and depth of expertise through the independent, roving businesses, and the ability to tackle major repairs or new vessel construction at the shipyards. At the same time, the shipyards definitely perceive these roving businesses as competitors that do not have to cover the fixed overhead shipyards face.

Support Industries (Marine Goods and Services)

The Maritime sector is supported by a number of additional industries. These industries include manufacturers of marine gear and equipment such as large winches and reels for working nets and long fishing lines, anchoring gear, and

⁵ <http://www.dnr.state.oh.us/news/jan00/boatingstudy.html>;
<http://www.mdsg.umd.edu/Extension/recboat93.html> (October 2003).

instruments, as well as wholesalers and retailers of marine gear whether made locally or in other regions, marine fuel stations capable of supplying large quantities of fuel to vessels, and marine service providers including financing, insurance, legal, surveying, naval architects, consultants, and boat brokerage services. For example, Seattle has over 100 practicing attorneys specializing in marine legal issues. This is the largest aggregation of marine law experts on the west coast. Very large cases such as the Exxon Valdez oil spill can have implications for so many parties that virtually every firm in Seattle with a maritime practice will end up involved in some way. In other service fields such as marine insurance or vessel surveying, the concentration of expertise in Seattle cannot be matched in any other West Coast city.

Many of the vessels are tied up in public or private marinas along the Ship Canal during the off season, or on the Duwamish River, or in the case of the largest vessels, in Port of Seattle facilities in Elliott Bay. A second tier of support industries exists including marine construction companies that build and repair marinas and marine terminals.

Water Related Industries

Other industries are linked to the maritime industries and often located on the waterfront because they depend heavily on water transportation. The most notable examples in Seattle are cold storage, seafood processing, cement plants, and marine construction. From a technical point of view, these facilities could be located away from the waterfront, but a waterfront location provides a more efficient solution for owners of these businesses. A waterfront location for businesses that receive shipments from ships or barges also minimizes use of Seattle's already congested roadways. The Pacific Northwest Ports Handbook lists 6 waterfront cold storage facilities in Seattle.⁶

These three water-related industries are likely to be enduring features on the Seattle waterfront. Each of them uses water transportation in a significant way for inputs or products. The marine construction industry is essential to the entire marine cluster since it builds and repairs the piers and other facilities in marine terminals and marinas, as well as the facilities used by millions of passengers on the Washington State Ferry system.

Other Industries Linked to the Maritime Cluster

Many other industries have strong linkages to the maritime cluster although they do not necessarily locate in the waterfront zone. The diversity and depth of expertise related to maritime issues is evident in the list of industries in Table 7. In addition, Seattle houses many maritime-oriented professional and trade associations (see a list of 30 associations in Appendix IX), and marine

⁶ *Pacific Northwest Ports Handbook, 2001-2002*. Marine Digest, Seattle (p. 197-8).

publications such as *National Fisherman* and *Pacific Maritime Magazine*. These linked industries are parts of larger industries whose maritime specialists are not reported separately by Employment Security or other government data sources. An input-output analysis reported below is used to roughly estimate the size of these linked industry components of the maritime cluster.

Table 7: Industries Linked to the Maritime Cluster

Harbor Services	Shipyard Suppliers	Intermodal	Professional Services
Chandlers	Marine repair	Forwarders & brokers	Naval architects
Line handling	Engines & propellers	Air, rail, and truck transportation services	Surveyors
Launches	Electrical	Container freight stations	Training & education
Ship Assist	Electronics	Centralized examination stations	Classification societies
Stevedores & Terminal Services	Deck machinery	Cold storage	Consultants-contingency planning
Union Offices	anchors, chain, & deck fittings	Container sales, storage & repair	Consulting engineers
Bunkering/Lubricants	Cargo gear, lashing & rigging		Consultants - other
Towing, salvage, diving			Professional services – other
Marine			Attorneys
Construction/Dredging			Insurance companies, adjusters & brokers
Tank & bilge cleaning			Seaman's centers
Environmental services			Employment services
Pilots & VTS			

Source: Pacific Northwest Ports Handbook, 2001-2002, p. 2.

APPENDICES

Appendix I: Steering Committee

The steering committee met several times during the course of the study and provided guidance to the authors on study design issues, as well as insights on particular issues, data sources, and characteristics of the maritime industries. Many committee members were instrumental in setting up, and in some cases hosting, focus groups. The assistance of these individuals was invaluable and is gratefully acknowledged. However, the findings reported in the study are sole responsibility of the authors and should not be attributed to any steering committee members of funding organizations.

Warren Aakervik, Ballard Oil

Richard Berkowitz, Transportation Institute

John Blackman, Argosy Cruises

Wayne Bouck, Coastal Transportation

Darrel Bryan, Clipper Navigation

David Harsila, Excel Seafoods

Steve Hughes, Natural Resource Consultants

Steve Isaacson, GE Capital

Bruce King, Garvey Shubert Barer

Sam Kuntz, Washington State Ferries

Pat McGarry, Manson Construction

Mike Moore, Puget Sound Steam Operators

Peter Philips, RH Philips Publishing Group

Ric Shrewsbury, Western Towboat

Eric Smith, GE Capital

Peter Strong, Coastal Transportation

Kim Suelzle, City Ice

Dick Sundholm, Harris Electric

Brian Thomas, Kvichak Marine Industries

Sue Williams, Jensen Maritime

Appendix II: Data Sources and Limitations

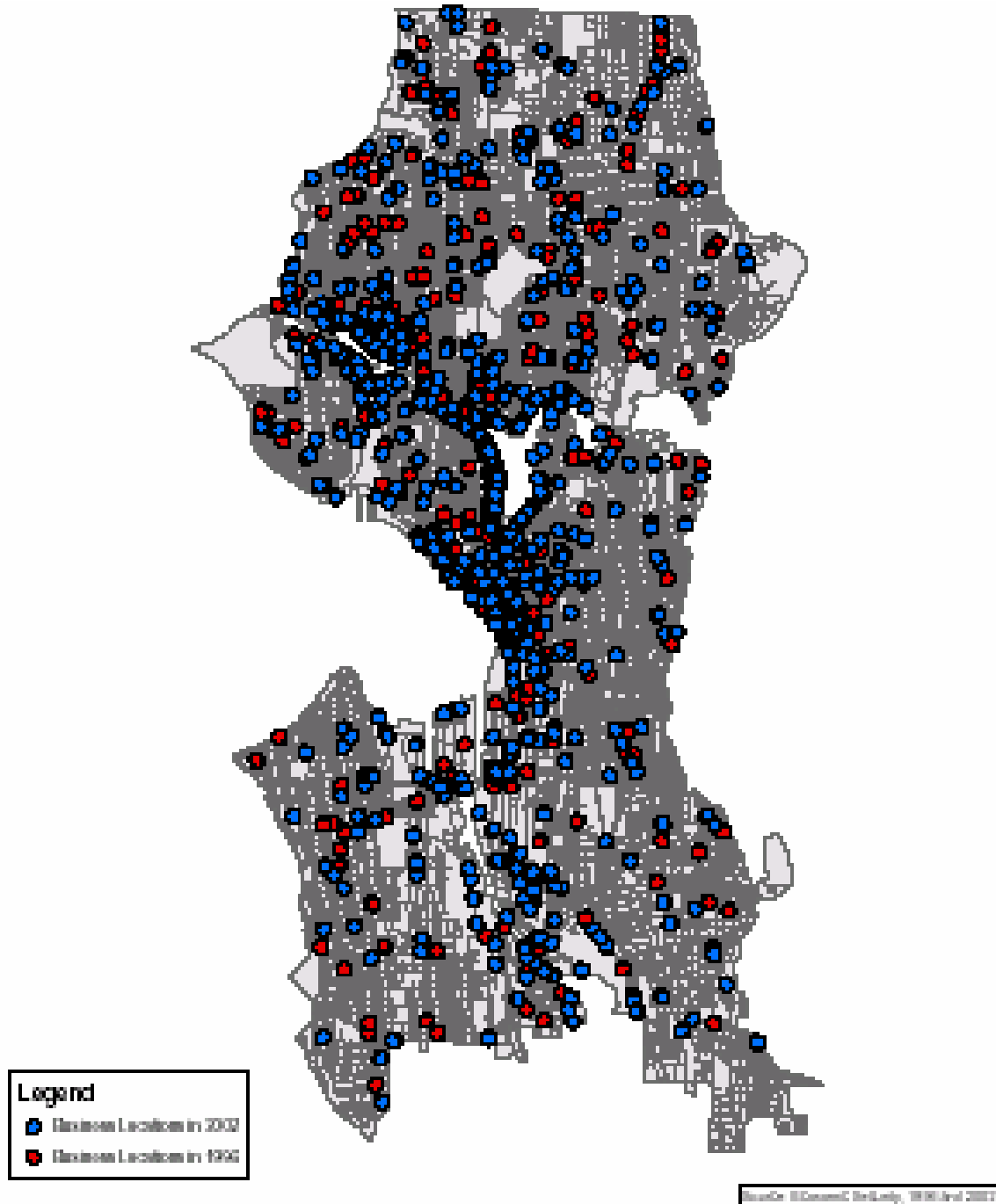
A King County specific version of the Washington State Input Output model constructs the economic impact estimates are using the data provided on the following core maritime industries.

Maritime Cluster SIC Codes

SIC	Industry	SIC	Industry
0912	Finfish	4482	Ferries
0913	Shellfish	4489	Water Transportation of Passengers, NEC
3731	Ship Building and Repairing	4491	Marine Cargo Handling
3732	Boat Building and Repairing	4492	Towing and Tugboat Services
4412	Deep Sea Foreign Transportation of Freight	4493	Marinas
4424	Deep Sea Domestic Transportation of Freight	4499	Water Transportation Services
4449	Water Transportation of Freight, NEC	5541	Retail Trade: Service Stations
4481	Deep Sea Transportation of Passengers, except by Ferry	5551	Retail Trade: Boat Dealers

Appendix III: Waterfront Usage

Figure 1 shows the location of maritime businesses in 1996 and 2002. The clustering of these businesses along the Ship Canal, Elliott Bay, and the Duwamish/Harbor Island is evident. The 2002 data overlay the 1996 data, obscuring most of the 1996 observations but making the important point that the location of these industries has not shifted much over this time period.



The table below provides a closer look at the maritime cluster businesses that are located within the waterfront zones of Seattle. In 2002, a total of 275 businesses with 9,349 employees were located along the waterfront. These figures underestimate employment and employers in fishing since many of the fishing vessel owners use their homes as business addresses. These 9,349 employees earned an annual average of \$58,399 in 2002.

Maritime Employers in the Waterfront Zone of Seattle, 2002

	Employment	1 st Quarter Payroll	No. of Establishments
Fishing	216	3,630,900	25
Water transportation	4202	73,142,739	50
Ship & boat building & repair	1510	17,580,552	46
Marine goods and services	2272	26,680,025	124
Water related industries	1149	15,458,414	30
Total	9349	136,492,630	275
Estimated Average Annual Wage, All Maritime Industries		\$58,399	

Appendix IV: Fishing Industry (Additional Information)

As shown in the table below, the size and value of the Alaskan catch is much larger than that reported in Washington, but industry sources indicate that approximately 80 percent of the Alaskan catch is carried out by Washington-based vessels, and much of it ends up in Seattle cold storage facilities by the end of the fishing season unless it is shipped out directly by air from Alaska as a fresh product. Note that there is some variation from year to year in the number of pounds and the total value of the fish catch, but there is no clear upward or downward trend.

	Pounds		Value (000s)	
	Alaska	Washington	Alaska	Washington
1996	5,012,875	391,741	\$1,141,000	\$148,285
1997	4,765,002	438,567	\$1,113,800	\$139,648
1998	4,858,052	418,985	\$950,200	\$123,223
1999	4,495,649	392,555	\$1,210,300	\$98,471
2000	4,465,987	380,223	\$1,126,400	\$145,311
2001	5,036,338	377,231	\$974,300	\$134,454

Sources: NOAA, Fisheries of the U.S. and NMFS Alaska Fisheries Science Center for the North Pacific Management Council, Stock Assessment and Fishery Evaluation

Employment levels and local payroll impacts of the Seattle-based fleet are difficult to estimate. Washington Employment Security Department data show a total of 962 persons employed at 170 Seattle business locations in the fishing industry March of 2002, out of a total of 568 fishing business establishments employing 1863 workers statewide. A total of 56 vessels are registered to owners in Snohomish County or in King County outside of Seattle. Comparing the number fishing establishments registered with Employment Security to the number vessels moored in Seattle as shown above suggests that some vessels moored in Seattle are owned by businesses listed at non-Seattle locations in Snohomish County or in King County outside Seattle. The combined number of King and Snohomish County fishing establishments is 226 – very close to the North Pacific Fishing Vessel Owners Association estimate of 233 vessels moored in Seattle. The combined two-county employment total is 1,009, a reasonable estimate of the total number of employees on vessels moored in Seattle. The comparable two-county employee payroll is \$80.7 million, attributable to vessels moored in Seattle. A Port of Seattle survey of vessels moored in Fisherman’s Terminal shows a larger number of fish vessel employees. This may be due to the common practice of vessel owners using their home addresses as business addresses. The employees on the vessel would then show up at the owner’s home address, which could be outside Seattle or even outside King county. The following table provides a broader look at fishing employment by county in Washington. Fishing businesses registered at addresses in Seattle accounted for 51 percent of statewide employment and 63 percent of the statewide payroll

in 2002. The NPFVOA data suggest that many of the vessels associated with businesses registered in King County outside Seattle and in Snohomish County are in fact moored in Seattle and use Seattle based maritime services. Since the larger multi-vessel companies and the very large deep draft vessels are all located in Seattle, some independent single vessel owners may be mooring vessels outside Seattle in ports such as Des Moines, Edmonds, and Everett.

Fishing Industry Employment and Payrolls, 2002

	Establishments		Employment		Estimated Annual Wage	Payroll	
	Number	Percent	Number	Percent		Value	Percent
Seattle	170	30%	960	51%	77,168	\$74,081,324	63%
Snohomish + King County (outside Seattle)	56	9%	49	3%	124,242	6,584,804	6%
Pierce	43	8%	122	7%	33,291	4,061,552	3%
Grays Harbor	78	14%	170	9%	45,262	7,694,472	7%
Pacific	70	12%	260	14%	32,654	8,489,968	7%
Whatcom	54	10%	39	2%	36,768	1,433,964	1%
All Other Counties	99	17%	260	14%	55,396	14,403,016	12%
Total	568	100%	1,863	100%		116,749,100	100%

Source: Tabulations prepared by authors from establishment files provided by the Washington Employment Security Department

Industry sources suggest that a crew of 5-6 persons is required for any commercial fishing vessel, but the larger vessels have substantially larger crews, especially the processing vessels. In addition, some workers are hired as independent contractors rather than employees, and many vessel owners may be self employed business owners rather than employees. Contractors and self-employed persons are not included in the employment tallies from Employment Security. If we assume that the 233 vessels moored in Seattle have an average crew size of 5.66 (the average for the 170 fishing businesses reported in Seattle), then a total workforce of 1318 is implied for the 233 Seattle-based vessels. If we add 233 self-employed captains to the total, the total workforce implied is 1551. The difference between the Employment Security figure of 962 and the modified estimate of 1551 could be explained by vessel owners who use non-Seattle addresses even though they moor the vessel in Seattle (many vessel owners use their homes as business addresses), and non-reported self employment.

To construct a high end estimate of the impact of the fishing industry on the Seattle area, the estimate of total employment for Seattle-based vessels (1551) is divided by estimated statewide employment in fishing (1863 plus 568 self employed vessel owners). This procedure suggests a total employment share

for Seattle of 64 percent of statewide fishing employment. If 80 percent of a typical \$1 billion catch in Washington and Alaska combined is attributed to Washington vessels, and 64 percent of the Washington vessel catch is assigned to Seattle-moored vessels, then the direct impact on Seattle is \$512 million. A crew (including self-employed captains) share of 45 percent of the \$512 million implies a payroll impact of \$229 million. If these estimates are correct, the average crew member, including vessel owners, earns \$98,904 per year. This is a high end estimate of the impacts. If as an alternative, the Employment Security reported payroll data for Seattle-based vessels is used, then the employment estimate drops to 1,009 with a payroll of \$80.7 million, implying a total value of the catch attributable to Seattle fishing businesses of \$163 million. These figures are used in the economic impact analysis below.

The available data suggest that the fishing industry provides a stable input to the regional economy valued at approximately \$512 million per year. Of that total, two thirds or more stays in Seattle due to expenditures on vessel maintenance and re-stocking, crew compensation, and services required by fishing businesses. This substantial economic impact is likely to continue, although regulatory changes are expected to affect the number of commercial fishing vessels that remain in the area.

Summary of Fishing Industry Characteristics, 2002

	<i>Seattle-moored vessels</i>	<i>Washington</i>	<i>Seattle as percent of Washington</i>
No. of employees	1,009	1,863	54%
No. of establishments	226	568	40%
No. of vessels moored in Seattle	233		
Payroll impact	\$80 million	\$117 million	68%
Estimated value of catch	\$512 million		
Crew share, including self-employed captains	\$229 million		

Rationalization

The North Pacific Fishery Management Council was created by the Magnuson Act passed by the U.S. Congress in 1976 to regulate the fisheries in the Gulf of Alaska, the primary area fished by Seattle-based vessels. This Council has historically regulated fisheries by mandating seasons for each fishery. A free-for-all involving any boat with a fishing license resulted, with over capitalization, substantial by-catch problems, and high enforcement costs involving, among other costs, the need for observers on the vessels. The salaries of these observers are paid by the fishing companies. Current plans are to “rationalize” the fisheries by switching to a system with a limited number of licenses but no time limits on the license holders. The fleet will shrink to a smaller number of vessels that will be active for a larger time period. Catch levels and employment may not change much, but the number of vessels will go down. Impacts on

support industries such as shipyards and equipment vendors are not clear, since the more intensively-operated vessels may have higher maintenance costs, thereby offsetting a reduction in the number of vessels needing annual haulouts, painting, and so forth. Some fisheries, e.g., halibut, have gone through this process, but it is just beginning for crab and has not been completed for salmon.

Appendix V: Water Transportation (Additional Information)

Employment data for these water transportation industries are arrayed in slightly different categories as shown in the table below. While industry sources distinguish deep and shallow draft vessels, the industry typology used in the employment reports distinguish water transportation services, passenger transportation services, on-shore cargo handling, and marinas rather than the industry distinctions based on the draft of vessels. A single category, boat dealers, captures all boat related retail spending of recreational boaters.

Water transportation employs nearly 11,000 workers are found at 169 establishments with an aggregate quarterly payroll of \$219 million. These figures imply an estimated annual wage of approximately \$79,300, with marine cargo handling having the highest wages in this group of industries and marinas having the lowest.

Employment in Seattle's Water Transportation Industries, 2002

	<i>Employment</i>	<i>Establishments</i>	<i>1st Quarter Payroll</i>	<i>Estimated Annual Average Wage</i>
Water transportation: freight	731	18	11,632,544	63,653
Water transportation: passengers	4448	20	65,860,859	59,227
Water transportation: marine cargo handling	5098	37	132,527,943	103,984
Water transportation: towing and tugboat services	271	12	3,944,816	58,226
Water transportation: marinas	76	21	541,435	28,497
Water transportation services nec	76	19	606,687	31,931
Boat dealers (called out separately in the main report)	351	42	3,944,816	44,955
Total, Water Transportation Industries	11051	169	219,059,100	79,290

Source: Tabulations prepared by authors from establishment files provided by the Washington Employment Security Department

Deep Draft Vessels – Additional Information

The amount of business that goes through Port of Seattle docks depends on a number of factors, including the relative size of local and distant markets that can be served from a given port, and the order of port calls on the west coast.

Due to the nature of the business, international containerized cargo carriers have linkages to locally-located international companies, trucking companies,

warehousing companies, and rail companies. However, the crews for the vessels are foreign, and the vessels themselves are built and maintained by foreign shipyards in order to take advantage of lower wage rates and less onerous environmental regulations.

The second sub-category of deep draft vessels are the tug/tow operators. Crowley, Foss and Western Tug transport non-containerized cargo among west coast ports, with the Alaskan market being the primary focus. In addition, these companies also transport oil products via barge from Puget Sound refineries to major distribution centers in the urban area. In addition, these companies provide local transportation services, such as moving aggregates from mines into the urban construction market. Compared to the international cargo carriers, these companies have stronger linkages to other maritime businesses in Seattle. Many of these companies build their own vessels and purchase supplies, insurance, and professional services almost exclusively from local vendors. Additionally most of the employees of these companies live in King County although a substantial proportion of them live outside of Seattle. Just as importantly, these businesses have strong forward linkages to the local bunker, fuel, and lubricants providers which are classified in the Marine Equipment sub-cluster. This second sub-category of deep draft vessels also perform a second function; they assist the large container and cruise ships upon entering Puget Sound and help guide them safely to the Port of Seattle terminals.

Both of these categories of deep draft vessels have a great deal of resources tied up in capital investments, and both require access to deep water terminals. Whereas the containerized cargo carriers use the deep water terminals as a place to load and unload containers, the smaller barge companies that service Alaska and the local market also utilize the terminals for longer term moorage for the barges as well as maintenance and construction services.

Trends in this sub-cluster are shown below. Nearly 1.5 million TEUs⁷ of containers were handled at Port of Seattle terminals in 2003. Frequent calls by the ships of these companies provide business opportunities for vessel assist (tugboat) companies, railroads and trucking companies, freight forwarders, customs house brokers, insurers, and bankers, among many other types of businesses. Ship calls, TEUs, and containerized tonnage declined after 2000, but according to the Port, TEU's began to recover in 2003. Recovery may be aided by increased traffic from China and other parts of Asia, although the Port of Seattle remains in competition with other West Coast ports.

Cargo Handled at Port of Seattle Terminals by Year

⁷ A TEU is a standardized measure of container volume; it refers to a Twenty foot Equivalent container Unit, although most modern containers are 40 feet in length. A single 40-foot container counts as two TEUs. Shipping volumes are also sometimes reported in metric tons. A west-bound container vessel crossing the Pacific Ocean is likely to be transporting more metric tons than an eastbound one because some containers are sent back to Asian ports empty. Non-containerized freight is usually measured in metric tons.

Year	TEUs	% Ch	Total Containerized Metric Tons	% Ch	Break bulk Metric Tons	% Ch	Vessel Calls	% Ch
1992	1,151,261		8,413,728		492,707		1023	
1993	1,151,405	0.0%	8,605,623	2.3%	558,280	13.3%	963	-5.9%
1994	1,414,950	22.9%	10,532,643	22.4%	706,929	26.6%	1081	12.3%
1995	1,479,076	4.5%	11,233,190	6.7%	774,207	9.5%	1202	11.2%
1996	1,473,561	-0.4%	11,181,854	-0.5%	716,196	-7.5%	1150	-4.3%
1997	1,475,813	0.2%	10,000,790	-10.6%	702,751	-1.9%	1121	-2.5%
1998	1,543,726	4.6%	10,292,170	2.9%	606,723	-13.7%	1076	-4.0%
1999	1,490,048	-3.5%	10,717,745	4.1%	474,465	-21.8%	1061	-1.4%
2000	1,488,267	-0.1%	11,664,031	8.8%	449,184	-5.3%	1092	2.9%
2001	1,315,109	-11.6%	9,941,504	-14.8%	220,427	-50.9%	964	-11.7%
2002	1,438,872	9.4%	9,704,293	-2.4%	174,780	-20.7%	990	2.7%
2003	1,486,465	3.3%	9,790,946	0.9%	117,925	-32.5%	1012	2.2%

Source: Port of Seattle

There have been declines in some aspects of the Port of Seattle's business activity since 2000. These include declines in worldwide shipping due to the general economic conditions as well as the terrorist attack on September 11, 2001, significant competition in the container business, and consolidation of some lines of business. However, the Port is seeing signs of recovery has had success in growing its cruise business and has found leasors for some of its formerly vacant property.

For example, the Port's warehouse chill facilities were closed as shippers consolidated operations in Southern California and switched to refrigerated containers. However, the area is seeing increasing uses as a warehouse and distribution center, and the Port's old chill facility recently reopened as a cold storage warehouse.

Consolidation of container handling in three major terminals has created an opportunity to find new uses for other Seaport property. The number of fishing vessels paying for moorage has declined as rationalization of various fishing fleets continues. Costs have increased to provide higher levels of security mandated by the U.S. Homeland Security Department. Finally, the west coast dockworker lockout may have resulted in some long term shifting of market cargo.

Also, the number of fishing vessels paying for moorage has declined as rationalization of various fishing fleets continues. The Port's marine division also manages the Shilshole Bay Marina serving recreational boaters. This marina has too few slips for larger vessels and too many for vessels 30 feet and under in

length, reducing its revenue potential until the docks can be remodeled.⁸ The Port Commission recently authorized a \$78.5 million renovation of the marina, which is expected to begin later this year.

The Port of Seattle expects to realize a 2.3% revenue gain in 2004 (excluding federal security grants), primarily due to re-leasing of facilities, new businesses and stronger economic conditions. With the inclusion of the federal grants, that figure raises to 15%.

Registered Vessels in King County

<i>Length</i>	<i>2001</i>	<i>2002</i>
<i>Overall</i>		
Under 16	18,207	23,746
16 & 20	19,115	24,386
21 & 30	8,190	10,534
31 & 40	2,743	3,455
41 & 50	1,015	1,247
51 & 60	199	237
Over 60	120	146
16 & Over	31,382	40,005
Total	49,589	63,751

Source: Washington Department of Licensing

⁸ This is a problem shared by many marinas in the Puget Sound as the average recreational vessel has increased in length over time. For example, the Port of Port Townsend indicated that it has the identical mis-match in its facility in a study conducted for Jefferson County (P. Sommers and K. Holabird, *Jefferson County Economic Assessment*, Report by Evans School, University of Washington for Jefferson County, June 2003).

Appendix VI: Water Related Industries

The table below shows the number of marine construction, cement and concrete, and seafood processing establishments located in Seattle, and their employment and payroll impact.

Water Related Industries in Seattle

Industry	Establishments	Employment	Annual Payroll	Average Annual Wage
Marine Construction	16	195	3,247,229	66,610
Cement and Concrete Manufacturing	13	1,026	13,348,778	52,042
Seafood Processing	22	6,133	83,949,147	54,752

Source: Tabulations prepared by authors from establishment files provided by the Washington Employment Security Department

Appendix VII – Survey and Focus Group Responses

What factors contribute to Seattle’s competitive advantage in the maritime industry?

Seattle has a long history of serving the maritime community, and it is precisely this history that has allowed the maritime cluster to grow and diversify in this area.

Geographic Advantages

Port of Seattle is buffered from high seas and storms

Naturally deep waters of the Puget Sound eliminate costly dredging operations

Vessel access to a freshwater lake

Proximity of Lake Union to Puget Sound and connection through Hiram M.

Chittenden Locks

Transition from salt water to freshwater inhibits marine biota from growing on the hulls of boats

Long term fresh water moorage reduces other maintenance costs due to a less corrosive freshwater environment

Controlled water level of Lake Union eliminates the need to constantly monitor and adjust mooring lines.

By boat, Seattle is the closest U.S. port to Asian markets by one day. In this age of just-in-time supply management, cutting a day out of the delivery times is attractive. Additionally, shipping companies save one day of fuel usage and other operating costs which are roughly \$50,000 per day per containership.

Seattle offers a number of advantages that stem from its physical geography and its long history of maritime occupancy. The physical characteristics of the area allow savings to be realized in a number of areas including transportation costs and maintenance costs. Additionally, the longtime maritime presence and the diversity of the maritime-specific goods and services available in the area allow economies of scale and external economies of agglomeration to be realized. Because much of the maritime industry is concentrated in Seattle, businesses realize supply-side transportation savings and delivery-side savings as well. It was pointed out by multiple focus groups that Seattle serves as a “one-stop shopping area” for vessels of all types and this is the *single* biggest reason that vessels continue to come here for service.

Due to the diversity and power of the maritime cluster in Seattle, similar clusters have been partially inhibited from growing in other regions. For this reason, many businesses in each of the sub-clusters export goods or services out of the area, adding to the export base of the city and region. For the same reasons, much of the income that businesses in the maritime cluster earn is retained by the local economy. Consider the following hypothetical example. New York Fast Ferry contacts a local ship broker who commissions the construction of a new

ferry from the Nichols Brothers Shipyard on Whidbey Island. This shipyard is likely to purchase almost all of their supplies from Seattle area marine parts companies, and the bulkier pieces are delivered by barge to their construction facilities. Of course, they also hire a local maritime law firm to iron out the contract, and insure the vessel for delivery through one of the local maritime insurance brokers. Upon delivery, New York Fast Ferry takes ownership of the vessel and insures it through their own insurance company which also happens to be headquartered in Seattle. Through its years of service, many of the marine specific parts needed for general maintenance are purchased through Seattle vendors. This example suggests that once maritime businesses bring money into the region, the strong backward linkages impact the entire maritime cluster.

What is the current state of the maritime cluster?

The focus groups have shown that the maritime cluster is well established and mature, but it is however, undergoing significant changes on a number of fronts. In order to better understand the long term consequences of the changes that are currently underway, these changes must be put in a context that allows such an examination.

The maritime cluster can be understood as having multiple drivers including the Fishing sub-cluster, Deep Draft sub-cluster, and the Shallow Draft sub-cluster. Each of these sub-clusters contributes greatly to the export base and has multiple backward linkages to the rest of the local maritime community. For this reason, the entire maritime cluster is somewhat reliant on the vitality of the businesses that fall into these categories, and it is imperative to understand how current trends are likely to impact the rest of the maritime cluster.

Fishing

The fishing industry is currently undergoing significant structural changes as more and more fisheries are moving from temporal based regulatory control to a quota based system. The temporal based system sets a limited time frame in which fishing is allowed. This type of regulatory framework was created to protect fish resources from over-harvesting. While this system was intended to protect fish stocks, it has also led to over-capitalization and over-fishing within the Fishing sub-cluster. Because there are no restrictions on the absolute number of fish each vessel is allowed to catch under this framework, this system motivates vessel owners to put as many boats in the water as possible. This regulatory approach is essentially overcome by capital investments, and the end result in over fishing. The alternative to this approach is a quota based regulatory framework. Under this system, licensed vessel owners are more productive as they can fish for longer periods of time, spend more time extracting protein from the catch, and generally make a larger profit from each fish. Under this method, vessel owners are motivated to invest in technology and larger vessels both of which allow them to more efficiently catch and process a larger number of fish. However, to make this system work, excess licenses have to be

bought out by the stronger players in the industry, putting many of the smaller and/or weaker firms out of business. The process of moving from a temporal based system to a quota system, including buying out excess licenses, is known as “rationalization.”

Currently the entire fishing industry is making the move towards rationalization as the dominant form of regulatory control. It is widely believed that the entire industry will be rationalized in the next 10 years and the results of this move will be profound. By examining the halibut industry, which is already fully rationalized, we can get a good idea of how the rest of the industry will adapt and change as a result of rationalization. Through the process of rationalization, the number of vessels fishing for halibut dropped to less than half of the previous number. This decrease in the number of fishing vessels has not had an entirely negative impact on the Shipbuilding and Boatyard sub-cluster or the Marine Equipment sub-cluster. As alluded to earlier, there is motivation for the owners of halibut operations to invest in larger vessels that can do secondary processing, and this is what has happened. New vessels were built and old vessels were upgraded with new equipment and new technology. It is also important to note that while there are fewer vessels, they are doing significantly more work over a longer period of time resulting in an increase in maintenance demand per vessel. In other words, boatyards are not necessarily adversely affected by this shift.

Some of the other impacts of the move to rationalization include increases in safety, which in turn result in lower insurance premiums. While it may be concluded *prima facie* that the maritime insurance industry would be hurt by a reduction in premiums, this is not necessarily the case. Although total revenue will drop, payouts will decline as well. While the maritime insurance industry is not negatively impacted, the maritime law firms are, as they are the representatives that are often hired to negotiate damage claims.

Deep-Draft Vessels

Another primary driver of the maritime cluster is the Deep Draft sub-cluster, especially Alaskan barge operations. Nearly all of the goods hauled to or from Alaska move through the Puget Sound, and the waterborne transportation businesses bring money into the Puget Sound by providing this service. Much of this income remains in the region as these businesses have extensive, local backward linkages. While general demand is relatively stable, both the Alaskan barge operations and the Marine Construction sub-cluster benefit greatly from large Alaskan public works projects. For the last decade or so, Alaska has not embarked on any large public works projects, but should new oil or gas fields open in Alaska, the impacts on the Seattle-based Alaska barge operations would be substantial. For the time being, however, it appears that this specific driver will neither grow nor shrink dramatically.

When considering the state of the containerized cargo carriers, it is clear that if all else remains equal, this industry in Seattle is most dependent on U.S.-Asia trading conditions and to a lesser extent on world economic conditions. Since the terrorist attacks of September 11, 2001, the U.S. has suffered through a general economic downturn, and a result of this recession is a decrease in international trade. Simply put, consumers worldwide have been buying fewer goods. This has not only impacted the containerized cargo carriers in Seattle, it has also negatively impacted the rail, trucking, petroleum, and warehousing businesses as well. Intensifying this situation, the SARS outbreak further depressed the world economy and the amount of trade conducted through the Port of Seattle. In short, the state of the containerized cargo carriers is highly dependent on world economic conditions and U.S.-Asia trade relations.

Additionally, the long term trend in the containerized cargo carrier industry constantly moves toward investment in larger capacity vessels. Larger vessels allow the carriers to take advantage of increasing internal economies of scale. Should trade levels remain stable or grow at a slower rate than the development and acquisition of larger vessels, fewer trips will be needed to satisfy trade demand. This situation would result in a decrease in demand for ship assists. Fewer ship assists would result in fewer demands on the tugs and slower growth in the Shipbuilding and Boatyard sub-cluster, which would in turn make fewer purchases from the Marine Equipment sub-cluster.

Cruise Ships

Cruise ships are a frequent fixture on the Seattle waterfront during the summer months, with terminals at the north end of the Seattle waterfront as well as down at the south end among the container terminals. In addition to paying for vessel assist and moorage services, these vessels bring substantial retail revenues to downtown stores, restaurants, and entertainment venues while they are in port. However, focus group participants felt that there is not guarantee that these vessels will continue to call in Seattle, and they do not tend to procure services or parts locally for maintenance of the these vessels.

Shallow Draft Vessels

While the state of the tug side of the Shallow Draft sub-cluster has already been discussed, the state of the small cruise vessel industry has not. Essentially, the small cruise vessel industry has experienced growth, and expects this trend to continue into the future. To a great extent the positive impacts that 9/11 have had on the domestic tourism industry have been counteracted by the new security measures that have been placed on the boat operators. However, the general consensus is that growth will continue and that this growth will be absorbed by the small vessel operators that are already established. The small vessel cruise industry has significant backward linkages to both the boatyards and to the marine equipment suppliers.

Other Maritime Industries

While the Marine Business Services sub-cluster has forward linkages to every other maritime sub-cluster, they have no backward linkages to any other sub-cluster. Essentially, the Marine Business Services sub-cluster exists as a regional hub because over the years, it has built up a critical mass. However, due to the nature of the businesses that are included in this sub-cluster, the vitality of this sub-cluster reflects the vitality of the entire maritime industry. In other words, the Marine Business Services sub-cluster relies on the businesses of the Seattle-based maritime cluster, but it does not matter *per se* where these businesses are located.

The final two sub-clusters, the Marine Equipment sub-cluster and the Shipbuilding and Boatyards sub-cluster, do not act as primary drivers for the Seattle maritime industry. Although they do export some goods, their primary role is to support the other sub-clusters that already operate in the area. Furthermore, these businesses have few backward linkages to other industries within the Seattle area. In fact, members of these sub-clusters have significant leakages as most of the equipment that they use or sell is in fact made overseas.

What pressures are currently being felt by members of the maritime cluster?

While the maritime cluster is currently healthy, established, and profitable, many of the businesses of which it is comprised are feeling increasing pressures beyond their control. These pressures can be conceptualized in a variety of ways, but for the purpose of this study, we will divide these pressures into two categories: regulatory pressures and market pressures.

Regulatory Pressures

Myriad Fishing Regulations and Rationalization: The fishing industry is one of the most heavily regulated industries in the U.S. Currently, each fishing vessel must apply for 25 to 30 separate operating permits each year and pay an application fee in order to have each of these processed. Regulations on the industry are severe, expensive, and often involve costly fees and record keeping according to focus group participants. There is an extensive list of regulatory agencies that oversee the fishing industry. The major agencies include the National Marine Fisheries Service (a division of the Department of Commerce), Fisheries Management Councils, OSHA, the EPA, the FCC, the Coast Guard, Washington State Department of Fisheries, and Alaska Fish and Game. These agencies operate under the authority of a number of federal acts including the American Fisheries Act, the Endangered Species Act, the Magnuson Act, and the Marine Mammals Protection Act.

Together, the number of regulations and bureaucratic hoops through which fishing businesses must navigate are making it difficult if not impossible for small, owner-operated vessels to enter the market, and they are making it increasingly difficult for current owner/operators as well. The net affect of increasing

regulations and the rationalization of the fishing industry will be to encourage larger companies to emerge. These larger businesses operate multiple larger vessels, and they will be able to take advantage of economies of scale and specialization within the firm. As regulations mount, the owner/operators of small vessels will be spending less time fishing and more time filling out paperwork. Eventually, it is likely that the number of smaller businesses will continue to decrease. This trend is already underway with Trident having taken over Tyson Seafood. Furthermore, there is a danger that the economic base that the fishing fleet provides will be lost if larger corporations located outside the region take over locally owned companies.

Environmental Regulations: A number of environmental regulations have been enacted by the federal government regarding water and air pollution. Led by the Clean Water Act and the Clean Air Act, environmental regulations are particularly burdensome on the maritime industry, and especially those located in Washington. Due to the sensitive nature of the habitats at the water-land interface, firms located on waterfront parcels face costs associated with monitoring storm water runoff and preventing the escape of toxins from their facilities. Monitoring of storm water runoff costs both time and money, as does the construction of storm water routing systems. One boatyard that participated in a focus group explained that at that time he had 15 workers working full time to re-route the surface drainage for the entire facility. Other participants noted that existing run off from the boatyards is far cleaner than the unregulated runoff from public highways and streets.

While the federal government sets the standards, it is up to state agencies to enforce them. The particular methods that individual states use to enforce these regulations are not mandated by the federal government which results in multiple systems that unevenly burden businesses. Members of the maritime cluster in Seattle believe that the state of Washington enforces federal regulations much more aggressively than Oregon. By comparison, British Columbia has even fewer regulations which give them a competitive advantage.

Port Access and the Lack of Grade Separation: While the general demand for the services of containerized cargo carriers is the direct result of international economic conditions and trade relations, the ability to meet that demand is a second factor that determines how well these businesses can grow. It is in this second area that the greatest pressures are being felt by the entire Deep Draft sub-cluster. Importers are increasingly relying on just-in-time shipping because this method of delivery allows them to hold less stock on hand and thereby realize savings. This approach also allows businesses to remain flexible and better able to respond to fluctuations in market demand. For these reasons, the quick and reliable delivery of goods and parts is essential to business functions, and in order to deliver goods quickly and reliably, the entire transportation system must be examined.

Because the Port of Seattle is located in such close proximity to downtown Seattle, the cargo carriers are faced with overcoming congestion on the access points to the port. Because the grades of the roads and railways are not separated in the downtown area, huge delays occur every day. Trucks loaded with goods are forced to wait while trains slowly amble by blocking multiple intersections at once. At the same time, the trains have to limit their speed while going through the congested areas as well. Due to the lack of grade separation, the entire transportation system becomes inefficient and less safe.

Access to Terminals: Focus groups respondents indicated that containerized cargo carriers characterize the Port's business strategy as packing as many of its tenants as possible onto each terminal to maximize revenues. The focus group participants indicated that this strategy severely limits these carriers ability to grow. One focus group member explained that his company can bring more or larger ships to Seattle, but the lack of land to handle cargo at their current facility would cause significant delays. For this reason, increases in demand are met by the Ports of Tacoma, LA/Long Beach, Oakland, and Vancouver, British Columbia. In fact, imports through the Port of Seattle have remained relatively flat even though exports from Asia have risen nearly 13% since Asian countries have begun to recover from the SARS epidemic. (Note: The Port of Seattle indicates that there is room for growth on all three container terminals, with potential to double current container volume).

One carrier found that the Port of Seattle was hesitant to commit to long-term lease arrangements because it was reconfiguring the uses on a number of the terminals. The problem that has arisen is carriers require long term terminal access for normal business functions, but the Port would not agree to more than a two year lease in this instance. Without a guarantee of long term access, this business feels that it cannot continue function. This firm's customers know that it does not have a long term lease, and therefore they may start shifting their business to competitors.

Lack of Protection of Industrial Land

Focus group respondents felt that in the last few decades, the manufacturing community has lost an estimated 30% of waterfront property to non-industrial uses. In addition to losing this land, which occurred mostly around the southern end of Lake Union, rezoning also affects the businesses that are located on adjacent parcels.

The largest conflicts arise when waterfront or near waterfront property is rezoned to residential/mixed use. This was the case for Foss Maritime, which has been located at the foot of the north side of Queen Anne for more than a century. When the property immediately upland from Foss's facilities was developed for residential uses, pressure to cease working at night was applied by owners of the new condominiums. This pressure has forced Foss to operate for fewer hours out of the day which decreases productivity.

Due to rezoning, it is also increasingly difficult for land intensive maritime industrial businesses to expand. In addition to a general lack of land upon which the maritime firms can grow, rezoning has driven land rents on waterfront parcels to a level that makes expansion uneconomical.

Of particular interest is the stretch of land between Terminals 25 and 46. Along this section of the waterfront, the Port of Seattle is faced with determining the best use of the land, and the maritime cluster fears that it will lose out to competing, non-industrial uses. Currently, Hanjin is located at Terminal 46, but speculation about redevelopment of this site may force Hanjin to move their facilities and it is believed that if they were forced to move, they would relocate to Tacoma.

Transportation Inefficiencies and Lack of Affordable Housing: One of the most common pressures felt by maritime businesses is traffic congestion. The linkages between maritime businesses necessitate frequent trips between South End facilities and North End facilities, and the 99 Corridor is the route of choice for these trips. For this reason, extreme concern has been expressed over plans to rebuild the aging and damaged Viaduct, and where traffic will be routed during construction. At one point, it took about one hour to load a truck at Harbor Island and deliver the goods to a Ballard facility. This same trip now takes more than an hour and a half. This 50% increase in travel time incurs expensive labor costs and added fuel costs. The 50% increase is applied to the multiplicity of trips that are made each year.

As an alternate route, Alaskan Way to 15th Avenue is considered too congested and the amount of pedestrian traffic increases risk. I-5 is not a direct path, and it often is too congested to use for transporting materials between the geographic clusters. For these reasons, the 99 Corridor is the best route for such transactions, and a plan that keeps this stretch of road open during construction is of paramount importance. The closure of the Viaduct following the Olympia Earthquake of 2001 nearly halted operations for the maritime businesses located in the Harbor Island/Duwamish Corridor area. During this closure, transportation times between the North End and South End facilities took more than 3 hours, so going to pick up a critical part would take almost an entire 8 hour work day. In addition to concerns about possible closure of the route during construction, many focus group participants pointed out that the alternatives under consideration all involve less road capacity and longer travel times than currently prevail. The 50% increase in transportation times and costs they have absorbed so far would increase still further, making this harbor somewhat less competitive as a location to build, repair, and operate vessels. At some point, the costs will rise too much and firms will be forced to either go out of business or relocate, perhaps to Tacoma.

A second problem that the maritime cluster faces regarding transportation congestion has to do with a general lack of affordable housing in the greater Seattle area. Because of the housing situation, many of the employees – especially the laborers – of the maritime cluster commute from points outside of the city boundary. As traffic congestion builds, maritime businesses are having an increasingly difficult time attracting workers that could otherwise work at manufacturing facilities outside Seattle. To combat this problem, many maritime businesses have changed their hours of operation, but traffic congestion is becoming increasingly difficult to outmaneuver.

Burke Gilman and Other Bike Trails: In their quest to increase the quality of life and make the city more environmentally friendly, bicycle commuting is being aggressively promoted by city officials. The Burke Gilman Trail will soon be expanded, offering a continuous bike route from Golden Gardens through Seattle and around the North End of Lake Washington and all the way out to Redmond. Cluster members believe that the choice to run the route along Shilshole Avenue and NW 45th Street could potentially devastate the marine industries located there. Several focus group participants felt that putting a bike trail between their facilities and the nearest arterial will eventually result in a collision between a bicyclist and a delivery truck. Should this happen, these companies' insurance costs would skyrocket to a price that would eventually drive them out of business. Similar problems face the South End businesses as bike lanes have been created along East Marginal Way South.

Construction Permits and the DCLU: One of the greatest pressures felt by the Shipbuilding and Boatyard sub-cluster and the Marine Construction and Terminal Operations sub-cluster has to do with the permit process for construction projects. Permits for construction along the waterfront are costly, complicated, and tedious to acquire. The general consensus among the focus group attendees is that the city is difficult to work with. One attendee commented that the City's first response to any construction request is always "No!" The permit process is seen as particularly onerous in terms of the length and cost of the process. Numerous examples were given which show just how difficult it is for these companies to obtain a building permit. In one example, a marine construction firm was told by the fire department that they had to replace a small wooden pier. The plans for a concrete replacement that they drew up duplicated the design and dimensions of the wooden structure. The permit for such a replacement, however, required more than a year to be approved. In another example, a simple wooden stairwell was to be added to a building so that there would be multiple exits in case of an emergency. The cost of the stairwell increased from \$2,300 to over \$5,000 through the negotiation of the permit. Another firm has spent several years attempting to get a permit to build a duplicate of an existing building that combines office and warehouse functions in support of a shipbuilding and tugboat operation. The permits necessary for this construction project have been held up because the city has determined that the warehouse operation is not a water dependent business even though the

applicant argues that the facility is an essential part of two clearly water dependent operations – shipbuilding and tugboat operations. Furthermore, congestion makes it very unattractive and expensive to site a warehouse at any other location where it might be approved.

The current system has two major impacts on maritime businesses, especially those located on the waterfront. First, many of these firms have had to employ full time consultants to negotiate with the DCLU. In addition to increased labor costs, these firms also face delays in capital upgrades which lower their productivity and increase the difficulty of growing.

It is commonly felt that regulators tend to decline a construction permit to maritime businesses out of a general and unproven perception that the maritime industry is a polluter. Environmental regulations for operations at the land-water interface make it particularly difficult for manufacturing type firms to grow. Simply put, manufacturing on the waterfront can potentially tax the environment and for this reason, the permitting process is particularly demanding.

Complicating the permit process is the city's drive to re-acquire street ends that have been used by maritime businesses for many decades. When these businesses own property on both sides of a street end, use by the public is unlikely, unsafe, and an intrusion on business operations that have been conducted there for many years.

Redevelopment of the SODO District: In addition to losing waterfront property to competing, non-industrial uses, the maritime cluster is threatened by the redevelopment of the SODO district. Mixed-use land use planning allows competing, non-complementary demands to be created in this former industrial area. Conflicts between trucks, trains, and commuter vehicles arise as traffic congestion increases in the area. Safety on these streets is compromised as well. In general, land rents increase and transportation becomes less efficient. These two factors drive up costs for the industrial businesses that remain in the area. Many of the equipment suppliers for the maritime cluster are located in this area. If they are forced to cease operations in SODO as these trends continue, some may simply shut down and others may locate to distant industrial parks, increasing the time required for deliveries and the congestion on the roadways.

Lack of Funding for the Operations of Washington State Ferries: Due to recent changes in the tax structure, Washington State Ferries have lost some of their funding. This negatively impacts the maritime cluster in two distinct ways. First, less maintenance is required by the ferries as the total number of miles traveled per year decreases. This has a direct impact on the boatyards and the suppliers of marine equipment. Second, fewer new vessels are added to the fleet, and many of the existing vessels were constructed in local shipyards.

Monorail: The final decision on where the proposed monorail will be built could have potentially negative impacts on the maritime cluster. Should the green line to Ballard be erected, the land one shipyard uses will be acquired, and this company will likely go out of business as their location is one of the firm's strategic advantages. Additionally, the competition for land along the Ship Canal will increase as mass transit makes the region more attractive for residents. This trend will drive land rents higher for maritime businesses, and long term restructuring is likely to occur. Because the maritime businesses cannot afford high land rents, firms will either move out of the city or cease operations.

B&O Tax: The final regulatory pressure felt by the maritime cluster is the onerous B&O tax. Many of the businesses in the maritime cluster work with large volumes and razor thin margins. As an example, the container carriers move large amounts of expensive cargo, and therefore have to pay a great deal in taxes compared to the revenues that they gain from their operations. In general, the firms which constitute the maritime cluster have to pay more taxes because of their location than they would pay if they relocated to British Columbia or Oregon.

Tribal Fishing Rights: Another pressure felt by the maritime businesses operating out of the Duwamish Corridor has to do with tribal fishing rights. Tribal fishing is unregulated, and when the tribes choose to fish, their nets can block the entire Duwamish Corridor, inhibiting the movement of vessels and normal business operations. Because of their immunity from federal regulations, tribes do not have to plan or announce when they will be fishing. Instead, when they choose to fish, they do, and vessel operators just have to work around their nets, if possible.

Market Pressures

In addition to the above mentioned regulatory pressures, number of market pressures is acting upon the firms that make up the maritime cluster as well. These pressures are the result of a number of factors, and they all work to negate the competitive advantages that Seattle has in the maritime industry.

Aquaculture: Increasing competition from fish farms is a market pressure strongly impacting the fishing industry in Seattle. Fish farms currently enjoy a number of advantages over the fishing industry. One of the greatest advantages to aquaculture is that the season can last all year. When compared to the short seasons of the salmon industry, which is not rationalized, the fish farms have a definite advantage in supplying fresh salmon to the market. A second major advantage is that wild salmon fishing businesses have large capital expenditures tied up in their vessels. The purchase, maintenance, and moorage of these vessels consume significant resources. The final advantage that aquaculture enjoys is that fish farms are not faced with an equivalent amount of permits and regulatory friction. The net affect that aquaculture has on the industry is to drive

down the price of fish. Simply put, fish farms can enjoy a steady supply of fish at a fraction of the cost of the fishing industry.

Farmed fish, however, do not share the same flavor characteristics as wild salmon. Additionally, farmed salmon are fed antibiotics and growth hormones, and often the meat contains artificial dyes. For these reasons, it is likely that should the salmon fisheries become rationalized (so that they can fish for longer periods throughout the year); they will continue to have a market.

In the fishing industry, salmon fishermen are the exception, not the rule. Most of the other types of fish caught in Alaskan waters are not threatened by competition from fish farms. At this point in time, the farming of halibut has not produced a marketable product, as the meat of farmed halibut is generally mealy and unpleasant.

Exchange Rates: In addition to the regulatory pressures that are being felt by the Shipbuilding and Boatyard sub-cluster, this division of the maritime industry is suffering from Canada's favorable exchange rate. An ever increasing number of vessels are choosing to be serviced in British Columbia for the simple fact that the exchange rate allows their money to go further. As an increasing array of marine specific goods are made in that country, the savings realized through a favorable exchange rate will increase, providing ever increasing incentives for vessels in need of services to go north of the border.

Railroad Access and Pricing: When considering the movement of cargo through the Port of Seattle, access to and the pricing of rail services must be taken into consideration, and Seattle is at a considerable disadvantage on both of these fronts. Due to the railroad pricing structure for transporting goods through Ports in Southern California it is actually less expensive to deliver goods to Chicago through Southern California than through Seattle, despite the fact that Seattle is closer. Presumably, the motivation of the rail companies (Burlington Northern Santa Fe and Union Pacific) is to route as much traffic as possible on these lines so that they don't have to spend money improving the capacity of the northern tracks.

In addition to the competition felt from Southern California, cargo carriers are also feeling competition from the Port of Vancouver. The Canadian railroad system has a strategic advantage in that it operates much like a system of one way streets. Whereas in the U.S., rail traffic flows in both directions on the same lines, in Canada, railcars only travel in one direction. The result is that fewer delays are experienced by Canadian carriers than U.S. carriers.

What can Seattle do to preserve and encourage the maritime cluster?

The maritime cluster in Seattle is faced with a number of challenges. The geographic advantages that characterize the area and have allowed the growth

of a strong maritime cluster are in a state of transition. Delays caused by congestion around the Port and by the pricing structure and lack of capacity of the rail system in the Northwest negate the geographic advantage of being one day closer to Asia. Additionally, rezoning has led to increasing land rents and the loss of the ability for many of the maritime firms to grow. Construction permits and the enforcement of environmental regulations both contribute significantly to the costs of doing business. Finally, traffic congestion inhibits transactions between maritime firms and when combined with a general lack of affordable housing results in the general inability to attract qualified labor.

Although the outlook might at first glance appear to be bleak, this is not the case. With a few exceptions, the firms of the maritime cluster are healthy and expect to maintain operations into the foreseeable future. Many firms continue to make capital investments, investments that would not likely be made if they believed that a move from the area was imminent. This is not to say, however, that these firms are satisfied with their transactions with the city. In fact, nearly all maritime businesses share a high level of frustration. They feel that the needs of the maritime industry are not considered, and they feel that the bureaucracy of the city is difficult and costly to navigate.

That said, the following list of items, if addressed, would make doing business in Seattle more efficient and less costly.

Appoint a public/private maritime industry liaison that will act as a voice for the maritime industry.

- Streamline and simplify the permit process.
- Design and implement new environmental regulatory practices that are more efficient and less burdensome.
- Work with the Port of Seattle and the maritime business community to create a plan that will not make it increasingly difficult for the maritime community to do business.
- Protect low land rents.
- Continue to work with other transportation agencies on transportation infrastructure improvement projects like the FAST Corridor Project.
- Re-route the Burke Gilman bike path in the Ballard area, and take the needs of businesses into account when making new routing decisions.
- Promote a Viaduct replacement project that will increase the efficiency of transporting goods between the Ballard and the Duwamish Corridor.
- Protect industrial and manufacturing zones from mixed use redevelopment.
- Rethink policy that promotes public access to the waterfront at the expense of business access to the waterfront.
- Promote trade through the Port of Seattle.
- Promote tourism.

Appendix VIII: Maritime Industry Study Survey

1. What is this establishment's organizational structure?
 - The only establishment of the firm
 - An establishment of a firm headquartered outside the region
 - An establishment of a firm headquartered elsewhere in the region
 - The headquarters of a firm with establishments elsewhere
 - Other organizational type
2. Please describe the ownership of the company:
 - family owned business
 - other privately owned business
 - corporation with publicly traded stock
3. Which best describes the type of firm where you work?
 - Regionally based, sells primarily in region
 - Regionally based, sell both in region and outside of region
 - Unit of U.S. company based elsewhere
 - Unit of foreign company
4. What year was your organization founded?
5. What year did your firm establish a presence in Seattle?
6. Why was this establishment located in Seattle?
7. Has this establishment moved within the last five years?
 - Yes
 - NoIf yes, why did the establishment move?
8. Is this establishment likely to move within the next five years?
 - Yes
 - Quite likely
 - Moderate chance
 - Unlikely
 - No

- Unsure
9. Why is it likely that a move will be made?
10. If you decide to move your company, is it likely that you will:
- Move to another Puget Sound location
- Move to a location inside Washington but outside the Puget Sound
- Move to a location outside Washington
11. What other location related factors are of importance to you as you look to the future of your business in Seattle?

Check

All That

Top

Apply

3

- Proximity to market
- Proximity to maritime industry
- Need to be on/near water
- Proximity to owner's residence
- Proximity/access to suppliers
- Proximity to labor/employee residences
- Have reputation/presence Seattle
- Central location
- Location in Ship Canal/Lake Union or other waterfront property
- Other _____

Which are the most important factors (pick up to 3 above)

12. What is/was your organization's average employment:

Today: _____

Five years ago: _____

Five years from now: _____

13. How has the distribution of employee residences changed in recent years?

- No change
- More local area employees
- Fewer local area employees
- More employees from elsewhere in the City
- Fewer employees from elsewhere in the City
- More employees from outside the City

Fewer employees from outside the City

14. Please estimate your company's average annual revenue growth over the past three years

- | | |
|-----------------------------------|------------------------------------|
| <input type="checkbox"/> Negative | <input type="checkbox"/> 11-20% |
| <input type="checkbox"/> 0% | <input type="checkbox"/> 20-100% |
| <input type="checkbox"/> 1-10% | <input type="checkbox"/> Over 100% |

15. Please estimate the percent of your sales made to customers in Seattle, in the rest of Washington, and outside of Washington?

Seattle _____% Rest of Washington _____%
Outside Washington _____%

16. Over the past five year has the location of your markets changed as a proportion of your sales?

- No change
- External markets have become more important
- External markets have become less important
- The Seattle market has become more important
- The Seattle market has become less important
- The market in the rest of Washington has become more important
- The market in the rest of Washington has become less important
- The market outside of Washington has become more important
- The market outside of Washington has become less important

17. Do you think these trends will continue?

- Yes No

If no, please elaborate:

18. How has the relative importance of your local sources of supply changed as a share of expenditures over the past five years?

- No change
- More important
- Less important

19. Do you expect these trends to prevail over the next five years?

Yes

No

If no, please elaborate.

20. Where are your major competitors located? (check all that apply)

Seattle Other Washington location Other US location Overseas

21. Please indicate which modes of transportation are used by this establishment and its suppliers and/or customers to move:

Goods and supplies inbound:

- Truck
- Rail
- Marine
- Automobile
- UPS/Federal Express
- Air
- Other _____

Products and services outbound:

- Truck
- Rail
- Marine
- Automobile
- UPS/Federal Express
- Air
- Other _____

22. The overall quality of transportation (e.g., roads, air transport, railroads and ports) is...

Very poor relative to other regions 1 2 3 4 5 6 7 Very good relative to

other regions

23. The available pool of skilled workers in your region...

Is too small and hinders your 1 2 3 4 5 6 7 Is sufficient to meet your

Your growth

growth needs

24. The cost of living in your region...

Makes recruitment and retention of employees easy	1	2	3	4	5	6	7	Makes recruitment and retention of employees difficult
---	---	---	---	---	---	---	---	--

25. City regulations and taxes affecting your business

Are inappropriate and hinder your firm's ability to succeed	1	2	3	4	5	6	7	Are appropriate and assist your firm's ability to succeed
---	---	---	---	---	---	---	---	---

26. State regulations and taxes affecting your business

Are inappropriate and hinder your firm's ability to succeed	1	2	3	4	5	6	7	Are appropriate and assist your firm's ability to succeed
---	---	---	---	---	---	---	---	---

27. Federal regulations and taxes affecting your business

Are inappropriate and hinder your firm's ability to succeed	1	2	3	4	5	6	7	Are appropriate and assist your firm's ability to succeed
---	---	---	---	---	---	---	---	---

28. Government's overall responsiveness and ability to work with the needs of business is...

Low	1	2	3	4	5	6	7	High
-----	---	---	---	---	---	---	---	------

29. The number of regional competitors for your business in your region is...

Low	1	2	3	4	5	6	7	High
-----	---	---	---	---	---	---	---	------

30. Regional competition in your industry is...

Low	1	2	3	4	5	6	7	High
-----	---	---	---	---	---	---	---	------

31. Associations and organizations that represent your industry...

Do not exist or are ineffective industry	1	2	3	4	5	6	7	Exist and effectively promote the interests of the industry
--	---	---	---	---	---	---	---	---

32. Firms in your industry...

Have no preference for the firms geographic location of their business partners 1 2 3 4 5 6 7 Prefer to work with firms located in the region

33. Firms and organizations in your industry...

Infrequently share knowledge 1 2 3 4 5 6 7 Frequently share knowledge

34. Firms and organizations in your industry...

Rarely contribute to industry-wide program 1 2 3 4 5 6 7 Frequently contribute to industry-wide programs

35. Firms and organizations in your industry...

Are unwilling to accept new members into industry all aspects of activities and organizations 1 2 3 4 5 6 7 Treat start-ups and new companies as full partners in industry activities and organizations

36. Please rate the importance of the following topics. On a scale of 1 to 5, 5 indicates a very important issue or that the current situation is excellent, and 1 indicates an unimportant issue or that the current situation is terrible.

Significance to you	Current situation	
1 2 3 4 5	1 2 3 4 5	Proximity to customers
1 2 3 4 5	1 2 3 4 5	Proximity to suppliers
1 2 3 4 5	1 2 3 4 5	Availability of labor
1 2 3 4 5	1 2 3 4 5	Quality of labor force
1 2 3 4 5	1 2 3 4 5	Zoning supportive of this type of business
1 2 3 4 5	1 2 3 4 5	Condition and capacity of streets
1 2 3 4 5	1 2 3 4 5	Conflict between bicycles and pedestrians
1 2 3 4 5	1 2 3 4 5	Conflict between commercial vehicles and autos

1 2 3 4 5		1 2 3 4 5	Quality and availability of truck service
1 2 3 4 5		1 2 3 4 5	Quality and availability of rail service
1 2 3 4 5		1 2 3 4 5	Quality and availability of marine transport service
1 2 3 4 5		1 2 3 4 5	Availability of intermodal service
1 2 3 4 5		1 2 3 4 5	Quality of and access to local streets
1 2 3 4 5		1 2 3 4 5	Quality of and access to the regional highway system

37. Would you like to share any experiences with us that pertain to any of the issues addressed in question 36?

38. Are there any additional topics related to your business that you feel should have been covered in this survey?

**This concludes the economic and business opinion survey.
Thank you for your cooperation.**

Appendix IX: Maritime Cluster Trade and Professional Associations

American Merchant Marine Veterans
American Waterways Operators
At-Sea Processors Association
Council of Master Mariners
Customhouse Brokers & International Freight Forwarders Association of Washington State
Marine Exchange
Marine Insurance Association of Seattle
Marine Technology Society, PS Section
Maritime Environmental Coalition
National Association of Marine Surveyors
Navy League
North Seattle Industrial Association
Northwest Marine Terminal Association, Inc.
NPFVOA Vessel Safety Program
Pacific Maritime Association
Pacific Seafood Processors Association
Port Engineers Society
Propeller Club
Puget Sound Shipbuilder's Association
Puget Sound Steamship Operators Association
Seattle Marine Business Coalition
Seattle Marine Underwriters
Society of Naval Architects and Marine Engineers
Society of Port Engineers of Puget Sound
Transportation Club
Transportation Institute
Western States Petroleum Institute
Washington/ BC Task Force
Washington State Maritime Cooperative
Women's Maritime Association

Source: *Pacific Northwest Ports Handbook*, Marine Digest, Seattle, 2002.