

A
Case Study
Of the
Intermodal Issues
Facing
The Puget Sound Region
and
The Port of Seattle



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Table of Contents

LIST OF FIGURES.....	5
LIST OF TABLES	5
INTRODUCTION.....	6
INTRODUCTION.....	6
PURPOSE OF THE CASE STUDY.....	6
REGIONAL OVERVIEW.....	9
GEOGRAPHICAL CONSIDERATIONS.....	10
SEATTLE TOPOGRAPHY	10
OVERVIEW OF STATE TO LOCAL POLITICAL LANDSCAPE.....	10
FUNDING	10
<i>Tax Levy</i>	10
PUBLIC PERCEPTION AND INVOLVEMENT.....	13
WASHINGTON STATE ECONOMY	14
MAJOR INDUSTRIES IN THE STATE OF WASHINGTON	14
SEATTLE INFRASTRUCTURE	15
AIR TRANSIT: SEA-TAC INTERNATIONAL AIRPORT	15
PORT OF SEATTLE SEAPORT	16
FREIGHT AND PASSENGER RAIL	18
HIGHWAY TRANSIT	19
INFRASTRUCTURE NEEDS OF THE CITY OF SEATTLE	24
CONGESTION.....	25
HIGHWAY CONGESTION	25
CONTAINER AND PORT ACTIVITY IN THE FUTURE	27
SEAPORT COMPETITION.....	28
COMPETITION WITH TACOMA.....	28
COMPETITION FROM VANCOUVER.....	29
COMPETITION FROM LONG BEACH AND LOS ANGELES	30
ENVIRONMENTAL ISSUES.....	31
WORKFORCE DEVELOPMENT ISSUES	32
SUMMARY.....	35
CHALLENGES	36
IMPLICATIONS FOR USING THE CASE STUDY	37
INSTRUCTIONS FOR CASE ANALYSIS	37
POSSIBLE DISCUSSION QUESTIONS	37
CASE DISCUSSION FORMAT	37
REFERENCES.....	38
ADDENDUM MATERIAL	41
Status.....	42
<i>FAST Partnership Fund Allocations 2003-04</i>	43

LIST OF FIGURES.

FIGURE 1. PORT OF SEATTLE.	7
FIGURE 2. WASHINGTON STATE.	9
FIGURE 3. PORT OF SEATTLE - 2.	16
FIGURE 4. CONGESTION POINTS	20
FIGURE 5. COSTS OF DELAY	20
FIGURE 6. ADDITIONAL TIME SPENT IN CONGESTED TRAFFIC.	21
FIGURE 7. PORT OF SEATTLE THE SOUTH SEATTLE INTERMODAL ACCESS	23
FIGURE 8. POINTS OF CONGESTION	24
FIGURE 9. PROJECTED RAIL BOTTLENECKS (YOUNG, ET. AL. 2001)	26
FIGURE 10. PORT OF LONG BEACH	30
FIGURE 11. LABOR PROTESTS.	33
FIGURE 12. PORT OF SEATTLE TOP TRADING PARTNERS.	48

LIST OF TABLES

TABLE 1. UTILIZATION OF TAX REVENUES BY THE PORT OF SEATTLE	11
TABLE 2. NUMBER OF LOADED TRUCKS IN STRATEGIC FREIGHT TRUCK CORRIDORS	21
TABLE 3. TOP TEN MOST CONGESTED CITIES IN THE US BY 2030	26
TABLE 4. MODE SHARE FOR FREIGHT THROUGH PUGET SOUND PORTS	27

Introduction

Purpose of the Case Study

The intent of this case study is to use a real world example to stimulate discussion and the exchange of ideas about challenges and opportunities in intermodal transportation. The effort to increase trade and commerce between APEC economies is based on the belief that open communication and dialog, and a sharing of technology and techniques will benefit all economies. Consequently, the following information has been prepared in the hope that it will serve this important educational purpose.

This case study should also be placed in its historical context. In 1996, APEC sponsored a study of Congestion Points in the APEC region. Seattle-Tacoma was identified as one of the key areas for further investigation. The present description is a longitudinal study, done over a ten year period, of many of the issues, concerns, and challenges that have been faced by the Seattle Region over the last ten years in an effort to address these problems. In some cases we have taken liberties with the actual chronological sequence of events in order to improve the pedagogical utility of the material. However, the problems reported are real, and require real solutions.

Intermodal transportation planning and management shares a key characteristic with other forms of business activity – it depends upon continuous and creative efforts at problem solving. Intermodal transportation depends upon problem solving even more than typical business activity, including typical transportation activity, because it requires the coordination and integration of infrastructure and organizations that were usually originally designed for independent, if not competing, activities.

Air, marine, rail, and road transport modes each have long and distinguished histories of competitive interaction in the movement of goods. It is only in recent years that the efficiency of integrated mobility solutions that make best use of each mode's commercial and technical attributes has been seriously pursued – driven by the pressing need to move more goods and people at lower levels of economic and environmental cost. Such intermodal innovation is yielding real gains in the productivity and efficiency of transportation systems at regional, national, and international scales. But it is also placing new challenges on the operators and managers of infrastructure and organizations where the challenge of coordination and integration is most acutely felt. Most often such modal interface occurs at airport, seaport, and rail and road terminal facilities. This case will thus focus on an example of intermodal problem solving by an organization with responsibility for a major international seaport and Sea-Tac airport in the heart of a growing metropolitan area– the Port of Seattle.

Seattle's port challenges are magnified by the success of the initial wave of intermodalism. Both trade and travel have grown considerably during the 1990s, and Seattle's ability to capture a significant, though not predominant, share of the Pacific Rim container trade has meant more movement of ships, planes, trucks and trains in the Puget Sound region. This

growth challenges port managers to further improve intermodal coordination and integration so that the costs of keeping up with mobility will not grow to the point that people and freight begin to avoid Puget Sound. Congestion, pollution, land use, and public opposition to infrastructure and operational changes (the NIMBY syndrome [Not In My Back Yard]) are all part of the challenges facing intermodalism in Puget Sound, and none face these issues more directly than the managers of the Port of Seattle.

In reading this case study, please keep in mind a few items. First, the majority of the information included has been obtained from published sources available in the public domain. Second, in only a few instances, where data were not readily available did we speculate as to what participants were thinking or feeling. Third, we have tried to obtain information regarding all modes of transportation in order to encourage systems based thinking about the problems of keeping up with best practices in intermodal transportation.

As you read the case, you should focus on identifying the key facts and issues that would enable an intermodal professional to develop and implement solutions to Seattle's transportation, environmental, economic, and land use challenges.

Try putting yourself in the place of persons who will be making decisions and dealing with the following questions:

- How to come up with innovative solutions.
- What priorities to set.
- What coalitions to build and develop to

How to build confidence in intermodal solutions.

- Developing funding solutions
- Other key outcomes



Figure 1. Port of Seattle.

Overview of the Port of Seattle

The Port of Seattle and the Port of Tacoma together form the third largest freight gateway for containerized cargo in North America (Fast Corridor, 2006). During the last 10 years, international trade has played a substantial role in bolstering the Seattle economy. Direct export sales by companies within the state were estimated at \$37.9 billion in 2005, the largest amount per capita in the U.S. and more than three times sales revenue in 1987. In addition, an estimated 400 million containers are shipped every year to ports around the world (Schulz, 2006). About .5 percent of this worldwide container trade, or about 2 million containers, come through the Port of Seattle every year. Containers have become the key to the international trade that has helped make Washington the nation's most trade-dependent state. In 2004, the Port of Seattle ranked seventh in the US in export sales and had the highest value of export per capita. A total of 2.1 million TEUs were handled at both the Port of Seattle and the Port of Tacoma, individually, in 2005. The Port of Tacoma ranked fourth in export tons (11,330,094), however ranking ninth overall behind Seattle (Port of Tacoma, 2006).

The Port of Seattle is responsible for the operations of the two major entry points to the city of Seattle – the port and the airport. Divided into three divisions – aviation, economic development, and seaport – the port's management is an intragal part of not only port operations but the economic growth of Western Washington.

On June 14, 2006 Mic Dinsmore, a former shipping line executive, who headed the port's marine division in the late 1980s, announced his retirement by year end as the executive director for the Port of Seattle. During his tenure he had the overwhelming support of port commissioners. Dinsmore's expertise is clearly a huge asset to the Port commissioners and reflects the importance of highly skilled executives with strong backgrounds service in leadership roles. The loss of such a successful leader will have undoubtedly have a huge impact on the Port. (Bond, 2001) Currently Charles Sheldon is the managing director.

In order to function effectively, the port has had to deal with a number of issues such as excessive spending, salaries and bureaucracy. Fisherman's Terminal, the 84-year-old home port for the region's commercial fishing vessels, has remained in the red due to declines in the fishing industry. Port leaders have given it a deadline for profitability, and have urged the general manager to seek out other ways to bring in revenue, such as offering moorage space for tugs and other industrial and service vessels. "If we don't operate efficiently and more competitively, we'll be out of business." Adds Dinsmore, "If we're not adding a return, we're more bureaucratic than entrepreneurial." (Bond, 2001)

Regional overview



Seattle is a Pacific Rim city, located on the northwest coast of the United States with direct access to the Pacific Ocean via Puget Sound and Elliott Bay. Seattle's coastal location in the northwest United States makes it a natural point of entry, or trans-shipment point, for trade between Asia and North America. A major Pacific port with strong trade linkages to Japan, China, Taiwan, South Korea, and Hong Kong (See Table 2), Seattle boasts it is the closest U.S. port-of-call by a day and a half, for most of the major ports in Asia, particularly those in Northeast Asia.

Figure 2. Washington State.

In addition, Seattle's location is particularly well-suited for trade into and from the northern interior of the United States, including the major cities of Chicago, Detroit, and Minneapolis. Seattle has an extensive interior hinterland region upon which to draw. Agricultural and other commodities from Washington, Oregon, Idaho, Montana, Wyoming, Colorado, North and South Dakota, Nebraska, Minnesota, Iowa, Wisconsin, and Illinois, as well as portions of Canada, regularly flow through the port of Seattle.

Seattle possesses some locational challenges in addition to its strengths. Its numerous bays and inlets near the coast, although advantageous for water transport, represent obstacles for ground transportation. Bridges, tunnels, and circuitous ground links create bottlenecks and choke points, thus contributing to increased landside traffic congestion. The Cascade Mountain range, just to the east of the Puget Sound region, is a topographic barrier to the movement of commodities into and out of the vast interior. There are a limited number of mountain passes through which freight rail and roadway links can pass. Both the water and mountain barriers can pose significant additional costs upon any plans for new or expanded ground transportation capacity.

The seaport of Seattle lies between the Port of Tacoma and the Port of Vancouver. Tacoma is situated approximately 30 miles south of the Port of Seattle. The Port of Vancouver is more than three times further, approximately 140 miles to the north. The three ports are currently aggressive competitors for both freight and passenger traffic. However, in such a globally competitive market the possibility of a future partnership, especially between Seattle and Tacoma, offer some unique opportunities.

Present and future regional population growth are important considerations when conceptualizing all the factors contributing to the success of the Port of Seattle. The Puget Sound Regional Council estimates that the region's population will increase from 2.68 million in 1990 to 3.86 million in 2010 -- in other words, gaining almost 10,000 people a month for the next decade. The City of Seattle's population is expected to grow from 516,290

in 1990 to 587,234 in 2010. This increase will most likely be felt in Seattle's downtown business core.

Last year, it was estimated that 22,000 people lived downtown. Seattle officials expect that number to rise to about 50,000 – 60,000 residents by 2010 (Lamm, 2006). Most experts believe Seattle's downtown will remain a major economic engine for the region, a center for jobs, finance and construction, drawing in large numbers of commuting workers. The Puget Sound Regional Council estimates that by 2010 there will be 62,000 new jobs in the downtown, filling the 1,000 acres that make up the business core with about 224,000 workers. (Mayne, 1997).

Geographical considerations

Seattle Topography

The Puget Sound Region has been described as one of the world's greatest natural deepwater ports. The city of Seattle sits on the western edge of the state and the eastern edge of Puget Sound. To the west of downtown Seattle is the West Seattle peninsula, separated from the city by the Duwamish Waterway and by Harbor Island. Harbor Island is an artificial island of nearly 160 hectares (400 acres) fringed by wharves and cranes and covered by warehouses and railroad yards. Along with the Pier 5 area and east waterway, Harbor Island is the Port of Seattle's major point of entry for cargo transferred from oceangoing vessels to trucks and railcars.

Overview of state to local political landscape

Funding

There are several different sources of funding available to improve and support transportation in the Puget Sound Region. These range from Federal funds available to the states as well as State, County, and city taxes. The Port of Seattle finances its operations through several means. The revenue generated from Port activities is used as one source of revenue, there is also a tax levy on the citizens. However, these sources do not completely cover all of the activities and planned development of the port. According to recent reports, the port contributes \$606 million dollars to the state in taxes and \$421 million dollars to the federal government in taxes.

Tax Levy

The Port of Seattle develops some of its income through taxes on the local community. This enables the port and the immediate area to be able to depend on a steady stream of revenue to operate the port as well as to be able to develop plans for the expansion of the port. At the present time the tax levy is used primarily to secure bonds which are then used for the

following activities and projects. Because of the revenues generated by the port in other areas the tax levy on local citizens that finance the port operations has been reduced from 45 cents per \$1000 in 1990 to 23.4 cents per \$1000 in 2006, for a total value of 63.7 million dollars.

Table 1. Utilization of Tax Revenues by the Port of Seattle

General Obligation	\$19,764,000
Central Waterfront Improvements	\$10,582,000
Construction Projects	\$1,089,000
Environmental Expense	\$1,000,000
Port Jobs	\$79,000
Access Improvements	\$586,000
Total	\$33,100,000

Over the past several years the Port has been involved in various referendum ballot measures that would be voted on by the general public. The funds generated by this measure could be used to support various projects and improvements designed to help trains and trucks move freight out of Puget Sound ports without getting caught in, or aggravating, the region's ever-worsening traffic.

At its November 17, 2004 meeting, The Port of Seattle commission approved a 5 percent property-tax increase for next year amid a budget debate over whether the Port should be collecting taxes at all. According to a report by the Seattle Times the 3-2 vote “revealed a division among commissioners and set the stage for a more intense showdown next year about whether the Port should try to wean itself off the tax by making more money from cargo containers and other maritime business.” (McOmber, 2004) Due to record revenues at the Port of Seattle, the Port was able to drop the tax levy by four and a half cents while maintaining the same tax revenues as in 2005. The Port of Seattle argues that “every tax dollar collected generates three more dollars in taxes to support schools and other public services.” (Port of Seattle)

The total 2006 Capital budget is \$619.9 million with and approved operating budget of \$228.6 million, 6.9 percentage higher than 2005. Total operating revenues increased 4.7 percent, budgeted at \$421.3 million. A 4 year Capital Improvement Plan totaling 2.5 billion began this year. The spending plan includes some \$739 million in construction projects, mostly at Seattle-Tacoma International Airport. The plan that the Commission approved puts the Port's share of King County property taxes at \$62.7 million. The Port's tax rate was reduced to 23.4 cents per \$1,000 of assessed value. The Port is able to collect more money without raising the levy rate due to rising property values in King County and to new construction that has increased the tax base. As noted above the property tax is a small portion of the Port's budget. The lion's share of the operating revenue is generated from rent and fees that companies pay to use Sea-Tac and the cargo terminals that the Port owns. (McOmber, 2004)

The Port uses the tax — which is only about 2.3 percent of the overall King County tax bill — mostly on docks and cargo terminals, road projects, environmental cleanup and job-training programs. None of it is used at the airport. The Port's decision to raise taxes next year by about 5 percent would exceed the 1 percent limit set by state. However, the Port is permitted to raise the tax rate because it has chosen not to in previous years thus earning a credit for future use. (McOmber, 2004)

On November 2, 2004 King County voters indicated their approval for a package of transit and roads projects, with more than two-thirds of voters saying "yes" on the advisory ballot. An article in the Seattle Post Intelligencer reported that transportation officials were mildly optimistic about these results. "It's easy to conclude people would like a better transportation system," said Doug MacDonald. "But it doesn't give us any guidance about how to put that together." According to the article, it suggests that the election results will mean that officials, who have been laboring for several years to put together a regional transportation package, will need to deal with opposition and practical realities to bring the projects to life.

Among some of the election-related developments likely to figure into the transportation picture:

- While voters clearly responded favorably to a roads-transit package, they splintered on what source of revenue they would favor to pay for it.
- Voters, even in liberal King County, voted resoundingly "no" on an initiative, which would have raised the sales tax a penny increase for education.
- Seattle voters gave a strong vote of support for the monorail and its 1.4 percent motor vehicle excise tax.

The paper reported that Democratic King County Councilwoman Julia Patterson and Republican Pierce County Councilman Shawn Bunney, who have been leaders in the effort to put together a regional transportation package, took heart in the King County vote. "It had strong support across the entire county," Patterson said. "There wasn't one area in the county where people said, no, they didn't like the idea. I think the results of this will invigorate our efforts to finalize a Regional Transportation Investment District plan and present it to the voters next year." (Hadley, 2004)

"I think the advisory ballot was a useless exercise," said state Rep. Ed Murray, D-Seattle, chairman of the House Transportation Committee. "It tells us people want transportation for free."

Since 1990, the City has actually lost transportation revenue sources. In 1995, the Supreme Court ruled the Street Utility Fee as unconstitutional. In 2002, voter approval of Initiative 776 eliminated the Vehicle License Fee from City revenues. Fuel tax revenues have declined more than 35 percent since 1996 in real purchasing power. The City's options for transportation revenues are limited at this time, while the need for transportation infrastructure maintenance and improvement is growing. SDOT would need to triple the annual amount of paving and reconstruction in order to reverse the net deterioration of

streets. · The cost of inaction would be high. As the condition of the transportation infrastructure deteriorates, it becomes significantly more expensive to repair or replace – effectively doubling every 10 to 15 years. (Source: City of Seattle, 2004)

Public perception and involvement

Public perception of transportation in the Puget Sound region and the Port of Seattle is extremely important to its ability to maintain revenue streams and develop infrastructure. At present the Port is not viewed favorably by a majority of the citizenry. The terminals at the south end of Elliott Bay that hold thousands of containers are often viewed by many of Seattle's residents as more of an ugly, environmentally unfriendly eyesore, than evidence of economic vitality. There has even been talk that some Seattle waterfront container piers should be used for other purposes, such as for building commercial offices or luxury condos with yacht moorage. Port officials have respectfully considered such ideas. But port observers dismiss such notions as uninformed and unrealistic. After all, there are only so many waterfronts, and the port's cargo traffic business is a major employer and generator of revenue for the state and the local economy. (Bond, 2001)

Some of the harshest critics of The Port of Seattle are neighboring residents objecting to its land-use decisions, such as people affected by the port's plans to expand. "The feeling among the people I represent is the port has attempted to steamroll them and push through new projects, arguing on the foundation of regional benefits," says Ken Reid, quoted in an article written for the Washington CEO magazine (Bond, 2001), former executive director of the anti-expansion Communities Coalition. Even in political circles, the port gets mixed reviews. "We carry a lot of baggage from yesteryear," Dinsmore says. "This institution needs to try harder and be more entrepreneurial. Highway congestion is another extremely volatile topic among voters. Citizens groups have filed complaints with the city government but frustration continues to grow. (Bond, 2001).

A daily column in the local newspapers provides readers with a mechanism to vent their frustration about transportation issues. For example, Geoff Hazel, who lives in Bellevue's Woodridge neighborhood, wrote complaining about the loud noise from truck compression brakes. "Frequently, I hear 18-wheelers rolling down the hill from Eastgate toward I-405 with their compression brakes roaring," he wrote. "Isn't there a law against this?" he asked. "And if there is, why does it seem as if it isn't enforced?" Apparently, Bellevue municipal code prohibits the use of compression brakes on city streets, according to Bellevue police Officer Marcia Harnden, but I-90 is not a city street. And the State Patrol says there is no law against the use of compression brakes on state highways. Thus, there is nothing to enforce. (Foster, 2002) Although the port is profitable with nearly \$210 million in 1996 revenues from operations, and an operating profit of \$80.3 million, the port has money to invest beyond the facilities it is maintaining and upgrading. It is not viewed favorably by many citizens. It has spent relatively little to stimulate public involvement to survey residents as to whether they will support expansion of facilities. However, it has under invested in some areas such as -- spending only \$17,500 to survey residents on whether they support an expansion of facilities.

A recent study of public opinion of transportation indicated that there is nearly unanimous perception that congestion in the Puget Sound region is bad and getting worse, although, most of the study participants felt that, while conditions were difficult, the overall impact was not intolerable. Congestion problems would still be severe even without considering freight traffic, due to the increase in everyday commuting, shopping, social, and recreational trips of ever-increasing numbers of metropolitan area residents. There was also widespread agreement that we cannot "build our way out of congestion." Some people currently avoid congestion by taking alternative routes, shifting their commute hours, or changing modes. Others suspected that they have progressively adapted to present congestion levels and do not notice the inconvenience. Nevertheless, traffic trends were troubling to most participants, and this concern about the future appears to be a prime motivating factor for investigating transportation pricing alternatives. (Ulberg & McFarlan, 1995).

Washington State Economy

Major industries in the State of Washington

According to the Washington State Office of Trade and Economic Development, Washington is the most trade dependent state in the country, containing 6.7 percent of the nation's population but accounting for 4.2 percent of the country's exports (U.S. Census Bureau, 2006). As of 2000, Boeing Company was the state's largest international exporter, accounting for one-third of the state's foreign sales. Agriculture makes up one-fifth of total sales and services make up one-fourth. In addition, it is estimated that 32 percent of all jobs within the state are related to trade (25 percent are export related and 7 percent are import related). Japan is Washington's largest international trade partner followed by South Korea, Canada, Taiwan and the United Kingdom, respectively. (This may have changed since Boeing has changed its corporate headquarters to Chicago in 2001.)

In a 1997 report entitled Foreign Exports and the Washington State Economy the Office of Trade and Economic Development states "no state has a higher percentage of its jobs linked to the world market." The report goes on to say that the state must foster a trade environment in order to maintain the economy from which we currently derive so much benefit. The keys to fostering this environment include having a well-educated and highly skilled work force, providing necessary technology, and maintaining accessibility to world markets. Adequate transportation infrastructure is a key component of maintaining accessibility.

Considerable media attention has been given recently to the growing concern Washington citizens have for transportation issues. While much of the attention has been directed toward personal mobility, freight mobility should also be of great concern. One can easily argue that the current transportation system is impeding the ability to move freight into, out of, and around the state, and is therefore impeding access to trade markets.

Over 70% of the imported containers that enter the Puget Sound region are in fact headed for points elsewhere in the US. The majority of the imported goods passing through the port are considered “high-value” goods which are those that are able to command a premium and are the main source of revenue for the railroads and shipping lines. According to the Freight Mobility Strategic Investment Board (FMSIB, 2003) over “two-thirds of Washington State imports are destined for locations elsewhere in the US.” This fact implies then that the freight entering Seattle Region ports are in fact discretionary and could be offloaded at one of many other ports such as Portland, Oakland, Long Beach or even Vancouver, BC. The Port of Seattle and Tacoma estimate that a total of 1.58 million containers were handled in 2003 or approximately 131,667 containers per month, or 4,329 containers per day or 180 containers per hour, or one container every 20 seconds. The largest ship entering the Puget Sound carries more than 6,600 containers. However, a typical “unit train” operated by the railroads is able to handle only about 220 containers, so it might take as many as 30 trains, each approximately 1.75 miles long to move that amount of freight through Seattle and into the continental United States. (WSDOT, 2003).

There are a number of factors that make up the economy of the Puget Sound Region of Seattle and the surrounding communities. These factors include the economic impact of the port on the surrounding communities, the mechanisms that affect the financing of the port, and the revenues that are generated from Port operations.

Seattle Infrastructure

Air Transit: Sea-Tac International Airport

Under the jurisdiction and operation of the Port of Seattle since the 1940's, Seattle's Sea-Tac airport is the primary northwestern air transit hub. The airport is located 12 miles south of Seattle proper and 20 miles north of Tacoma. Ranked the 17th busiest commercial airport in the nation, the airport serviced 29,289,026 passengers in 2005, a 1.7% increase from 2004.

The construction on the central terminal, international terminal, intra-terminal transportation system, and the parking garage has greatly expanded the airport's capacity. The central terminal was completely renovated creating a large, spacious, modern facility with additional eateries and shops for travelers. The international terminal was expanded doubling the terminals gates, thus increasing international traffic and tourism. The intra-terminal subway system now includes new trains and track making ticketing and security points more accessible. The parking garage is currently the largest single-roof facility in the country, with 13,000 parking stalls.

In addition to commercial air service, Sea-Tac airport operates a significant amount of air cargo operations, ranking 28th busiest cargo airport in the United States. The facilities encompass 900,000 square feet of cargo warehouse, airmail, and office space support a total of 338,591 metric tons in 2005. Total air cargo area, including aircraft parking is over 3 million square feet.

The airport presently operates with only two parallel runways with respective lengths of 11,500 feet and 9,425 feet. Weather inherent to the region creates delay difficulties during times of low cloud cover reducing the number of useable runways to one during these times. In order to elevate delays and related costs, the Port of Seattle is presently constructing a third all weather parallel runway. The cost of this project will not result in a tax levy, but rather will stem from landing fees and federal bonds.

Perhaps the most important construction project, creating intermodal access to the airport is the extension of the light-rail line station connected to a passenger walkway leading to the central terminal. With initial groundbreaking occurring in the summer of 2006, the project hopes to be completed in 2009. Total cruise ship passengers are estimated to reach 735,000 in 2006, more than double the 2003 statistic. The addition of an intermodal transportation system linking the airport to the downtown Seattle area could greatly increase, not only local tourism, but the future profitability of the Port of Seattle.

In addition, with 73.9% of cruise passengers arriving via Sea-Tac airport in 2003, additional expansions to the airport terminals, facilities, and runway are an important component in expanding the passenger capacity of the Port of Seattle (John C. Martin Associates, 2004).

Port of Seattle Seaport

The Port of Seattle Seaport has been a leader in containerized cargo from the industry's inception. To meet the growing demands of our global society, Seattle has already invested over \$600 million in its container terminal infrastructure and nearly \$400 million is planned for further improvements. With expansive facilities, upgraded infrastructure and new technology, Seattle is positioned to double its current container volume to 4 million TEUs in half the time they doubled their volume to 2.1 million TEUs. Seattle is the fifth largest container port in the U.S. and 37th in the world, handling 2.1 million TEUs in 2005. Its four container facilities include:

- 15 berths up to 50 feet deep
- 26 cranes, including six super post-Panamax cranes and 11 post-Panamax cranes
- High tech gates providing secure and expedited cargo turn times
- Nearly 500 acres of dedicated cargo terminals
- Computerized cargo tracking systems
- Two major interstate highways within 5 minutes of all terminals for efficient truck access
- Integrated real-time computer software system for vessel
- On-dock and near-dock intermodal yards provide quick



Figure 3. Port of Seattle - 2.

According to a poll conducted by Marine Digest & Cargo Business News (2003) a national maritime industry trade publication, the Port of Seattle was rated number one in customer service among U.S. ports. More than 1,200 shippers were surveyed during the months of July, August, September and October 2003. Factors that contributed to Seattle's strong showing include the investments the Port has made in recent years in its marine terminals, road and rail connections and other infrastructure. Efficient terminal operations, strong relationships with shippers and a willingness to work on their behalf to solve problems are all reasons for Seattle's solid reputation. The top five ports for productivity and reliability as ranked by shippers are: Port of Seattle, Port Authority of New York-New Jersey, Port of Long Beach, Port of Los Angeles and Port of Tacoma.

Larger ships need larger terminals and immediate access to railroads, to get goods on their way to destinations quickly and efficiently. Long Beach, for example, has seven container terminals averaging 100 acres each, and has on-dock rail systems at four of the seven terminals. Cramped for space, the Port of Seattle is doing what it can to catch up. The port currently has a \$3.3 billion plan for capital improvements.

APL's expansion of Terminal 5 from 85 to 160 acres (190 when an option is exercised in future years), plus rebuilding numerous buildings, cleaning up a SuperFund¹ site along the harbor and adding a brand-new 9,000-foot intermodal rail system.

The \$300 million expansion of Terminal 18 completed in 2002 added 90 acres for a total of 196 acres, expanding its on-dock rail system to 8,000 feet and creating 1,300 new jobs. By financing the expansion with bonds, the port saved \$60 million in capital capacity.

In May 2006, the Port of Seattle announced that Mediterranean Shipping Company (MSC) will be making port in terminal 18 beginning in 2007. MSC is the second largest operator of container ships and one of the fastest-growing maritime transportation companies in the world. It is anticipated that this partnership will bring 221,000 container TEUs to Seattle and create 300 local jobs. (Port of Seattle, 2006)

Terminal 25 has recently been undergone a \$20 million renovation project for Matson Navigation who docks there. Similarly Terminal 45 has recently been updated at a cost of \$70 million. A new 16-lane truck gate with state-of-the-art optical character recognition technology, new terminal buildings, additional container yard acreage, a stronger pier apron and a new fender system were added. (Port of Seattle, 2006)

In February 2006 the port began the process of expanding the capacity of Terminal 30. When renovated and combined with facilities in terminals 25 and 28 the port would contain 70 acres for handling cargo and two vessels berths. (Port of Seattle, 2006)

¹ Superfund sites are environmentally contaminated areas that have been designated for clean-up by the U.S. Environmental Protection Agency (EPA). This process was authorized through the U.S. federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980

There are plans to combine the land from Terminal 37 to Terminal 46 to create a larger area, however, this proposal may run into opposition from citizens because of its proximity to the Seattle Mariners professional baseball stadium and the football stadium where the Seattle Seahawks play. (Port of Seattle, 2006)

There are discussions about renovating Pier 48, which is the former location for passenger vessels. (Bond, 2001) "If we're unable to move our goods to the market in a timely manner, we will lose market share to other ports, particularly the ports of Vancouver, B.C., and L.A./Long Beach -- and it's awfully difficult, once you lose market share, to recapture that business," says former Seattle Port Commission president Gary Grant.

A completed project, the on-dock rail yard, a \$260 million project, was financed through APL's lease revenues.

Freight and Passenger Rail

The Puget Sound area contains a number of transportation options run by Sound Transit, which combines light rail, commuter transit and buses. Currently the 44 year old monorail system, built in 1962 for the World's Fair, is at the center of much debate. In the last couple of years the system has experienced serious incidents such as fires and collisions due to aging equipment. It has been estimated that needed improvements would cost \$4.5 million to patch the system that was created with an expected lifespan of 30 years. (Lindblum, 2006)

Sound transit also operates commuter trains to offset congestion issues. However many of the lines have not seen the anticipated ridership promised to justify the enormous cost. Thomas Coad writes in a February 21, 2006 article in The Seattle Times:

In an urban area that absorbs about 11 million daily trips – and growing higher each year – this impact on congestion will be infinitesimal and indiscernible. To suggest that a tiny number of commuter-rail passengers will make a difference is absurd....In the planning stage is a \$1.5 billion tunnel to connect downtown Seattle with Husky Stadium, a project intended to be the first stage to extend light rail to Northgate....Because so much money is being lavished on grandiose rail schemes that do little to reduce traffic congestion, it is increasingly difficult to take sensible steps to improve transit mobility. Being ignored or underfunded are bus routes to new suburbs, installation of real-time traffic information systems. Extension of HOV lanes, implementation, repair or replacement of the highway 520 bridge, road improvements at various "pinch-points," and other cost-effective projects. (Coad, 2006).

According to the Washington Transportation Plan, there are 3,102 miles of track operating throughout the state. (WSDOT, 2001) Burlington Northern Santa Fe (BNSF) owns the major portion of track (68 percent), and the remainder is owned by Union Pacific (UP) Railroad (12 percent), various short line companies (20 percent) and switching/terminal companies (<1 percent). Six major strategic corridors have been identified for freight movement by rail. The WSDOT indicates that several congestion points along the freight rail network result in

corridors that are already operating at or close to capacity. Rail track runs primarily on exclusive right-of-way so, improvement of the rail corridors has greater potential for increasing freight carrying capability than building new highways. Furthermore, since local transit authorities built over \$300 million of improvements there are now few issues exist regarding conflicts between passenger versus freight transport. Unlike roadways, passenger volumes are much lower than freight volumes and the balance between passenger and freight movement is controlled by policy. (Young, et. al., 2001).

The railroad mainlines run through the heart of the Western Washington metropolitan areas. Fortunately, the distance between the harbors, railroad switching yards and the main rail links is short although not all terminals have on-dock-rail and containers still have to be trucked, adding to the congestion. In addition rail capacity was recently increased when Burlington Northern Santa Fe reopened the Stampede Pass rail line, providing a third link across the Cascade Mountains although it is limited to single stacked containers. However, the reopening of Stampede Pass also means more rail traffic through Auburn and other cities along the mainline, causing legitimate concern among city leaders about the impacts on their communities. (Dinsmore, 1997).

Highway Transit

There are approximately 80,000 miles of paved and unpaved roadways in the State of Washington. Of this, approximately 7,000 miles of roadway are classified as State Routes or Interstate Highways. WSDOT is the public agency responsible for maintaining and/or improving all state highways. The following state highway segments have been identified as strategic truck corridors for freight movement: (also see Fig. 7):

- Interstate 5 (from the Canadian border to the Oregon border)
- Interstate 90 (from the Idaho border to Seattle)
- Interstate 82 (from Ellensburg to the Oregon border)
- State Route 2 (between Wenatchee and Everett)
- State Route 12 (SR-12W from White Pass to Interstate 5, SR-12E)
- State Route 97 (from Wenatchee to I-90 at Cle Elum)
- State Route 395 (between Spokane and the Tri-Cities)

The congestion on the highways has increased considerably over the past 15 years. If population increases and freight increases continue we can expect these trends to produce an increasingly unmanageable transportation system to develop.

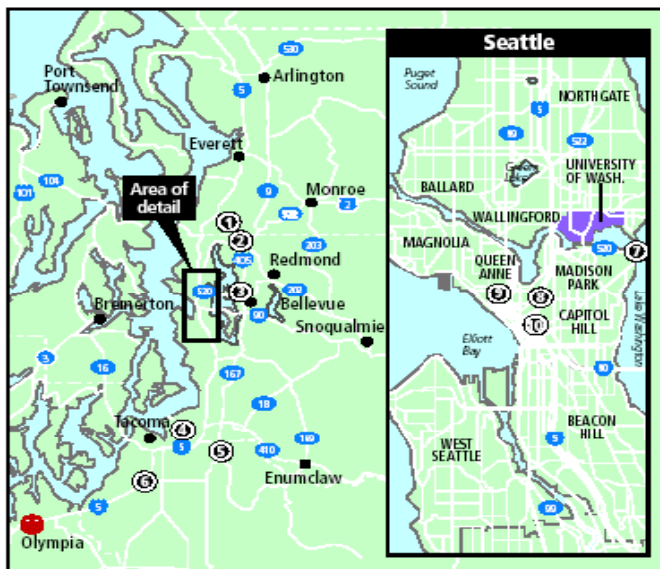


Figure 4. Congestion Points

The inset map in Figure 5 also shows the congestion points in the city of Seattle urban areas. These congestion points also coincide with key access routes to the freight and container terminals in the Port.

Increase in Annual per Person Average Cost of Delay 1983 to 1999		
Metropolitan Area	1983	1999
Seattle – Everett	\$255	\$930
Spokane	\$ 35	\$180
Tacoma	\$ 45	\$490
Vancouver, WA – Portland, OR	\$ 50	\$610

Figure 5. Costs of Delay

Furthermore, many of these routes are bisected by existing rail lines that stop traffic at crossings. Thus, these congestion points have a major impact on the movement of freight out of the port and into the hinterlands.

Figure 6 also shows the impact of congestion on the average commuter in the Seattle area. Over the past twenty years the estimated cost of traffic delays has more than tripled in the Seattle Everett area and has increased more than ten-fold in the Vancouver-Portland region.

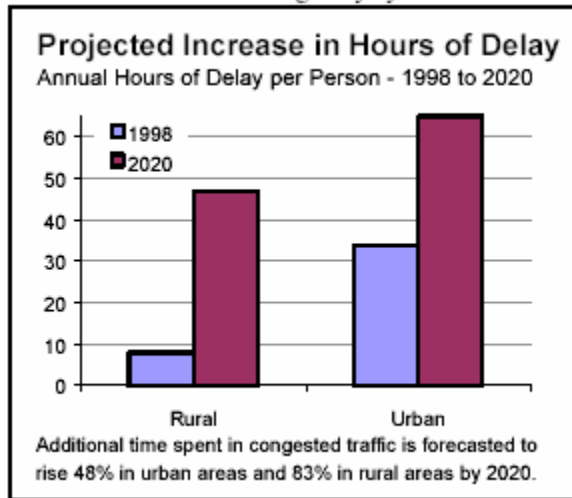


Figure 6. Additional time spent in congested traffic.

The majority of truck freight is also carried along these corridors. Table 2 shows the existing and projected future numbers of truck trips generated by waterborne cargo that have been projected for each of the truck corridors. (Young, et. al., 2001)

While freight traffic makes up only a small portion of the total traffic on the Washington State Highway System, it is more concentrated in urban areas, especially in the Seattle/Tacoma/Everett area. In 1995, approximately 27.6 billion vehicle miles (VMT) were traveled on state highways. Forecasts indicate that VMT on state highways will grow to 48.5 billion miles in the year 2020, an increase of 79 percent over 1995 volumes. (WSDOT, 1998)

Table 2. Number of Loaded Trucks in Strategic Freight Truck Corridors

Truck Corridor	2000	2020
	Puget Sound Ports	Puget Sound Ports
Interstate 5	1,261,000	1,736,000
Interstate 90	127,000	193,000
Interstate 82	38,000	57,000
State Route 101	122,000	156,000
State Route 2	2,000	4,000
State Route 12E	11,000	18,000
State Route 12W	12,000	14,000
State Route 395	5,000	8,000
State Route 97N	9,000	14,000

The level of congestion on roadways is measured by level-of-service (LOS). LOS is calculated based on the average level of delay experienced by vehicles on a roadway. The WSDOT report indicates that numerous highways in the Seattle area in particular are operating at congested levels. According to projections, by 2020 vehicles traveling on a

significant portion of the strategic truck corridors will experience high levels of delay. In the Puget Sound metropolitan area roadways are highly congested during the morning and evening peak periods. Most observers believe that any increases in roadway capacity in the urban areas will not likely improve truck travel conditions, since they would most assuredly result in a proportional increase in the number of competing travelers. (WSDOT, 1998).

Realistic efforts to improve freight movement by truck could include roadway improvements dedicated to trucks (similar to the high-occupancy vehicles lanes for passenger transport) or economic incentives for traveling at less congested times. (Young, et. al., 2001)

In Seattle trucks use the same roads as the passenger vehicles, so as population increases there will be more congestion on streets and highways. Seattle is particularly hard hit by the fact that the existing rail lines from the docks all pass through the central downtown area of Seattle. Traffic delays at rail crossings are frequent. Citizens groups have filed complaints with the city government and with the railroads. Frustration is mounting over this issue. Citizen support is necessary for support of special bond issues and tax levy's.

Government officials concluded in a key report that a major obstacle to freight mobility is the lack of smooth connections between different parts of the transportation systems. In the Puget Sound region there are many of the bottlenecks and rough spots. This can also be seen in the traffic pattern map on the next page.

Some forecasts suggest that trade will double by the year 2015. But growth in cargo volumes means longer and more frequent trains. As train traffic rises, delays at highway crossings will inevitably increase. Already, for example, at the Royal Brougham rail and highway crossing in Seattle, the delays add up to several hours each day. Thus, the likelihood of more congestion on the roadways, motorists stalled for long periods at rail crossings, and an increasingly frustrated public driving public seem inevitable.

One very high profile project involving planners from both the State of Washington DOT, the City of Seattle, and the Port of Seattle involve improvements to State Route 519 and Royal Brougham could lead to significant reductions in traffic congestion (Port of Seattle, 2006). This project is noteworthy for its collaboration between different municipalities. Also, it is very visible in that it interfaces with the two sports venues for the professional sports teams and the mainline of the major freight railroad BNSF that pass nearby. In cooperation with the Port of Seattle the South Seattle Intermodal Access project is also designed to improve the situation by separating road and rail crossings. The project also improves vehicle and freight access between I-90, the ferry docks and the cargo terminals. Proceeding in two phases, Phase 1 consists of constructing ramps and an overpass from Atlantic Street onto I-5 and I-90. In addition, the SR 519 Surface project requires moving the BNSF yard rail track from underneath the Viaduct to the east side of Terminal 46. This spur track from the BNSF yard is used as a pus-pull line to link cars together and make up outbound trains. Currently, use of this spur is limited to non-rush hour times slowing down freight operations during those times nevertheless it still creates significant delays at other times. Ultimately, this project will eliminate these major conflicts. Planning for Phase 2 is

underway and will result in west-bound waterfront access from I-5 and I-90 that was originally located on Royal Brougham Avenue.

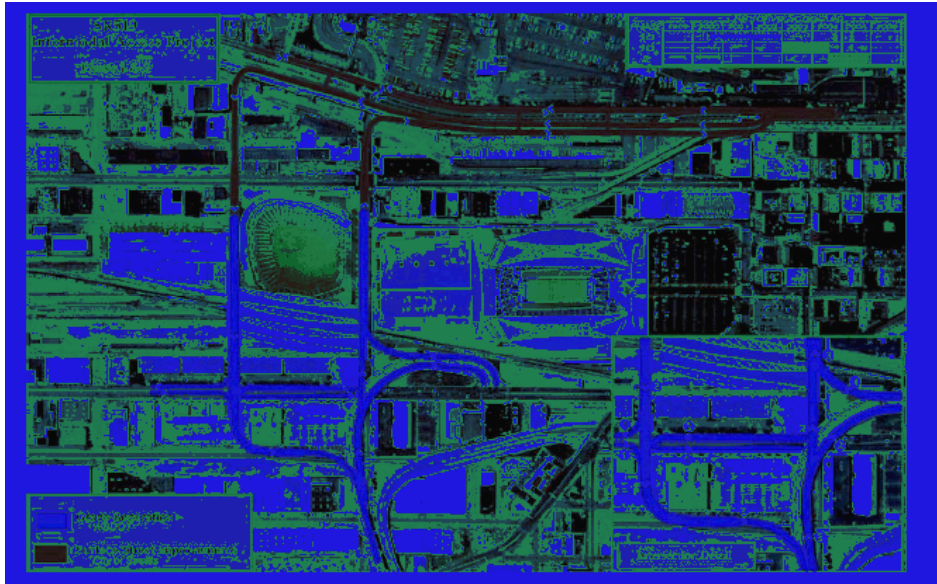


Figure 7. Port of Seattle the South Seattle Intermodal Access

This aerial photo shows the area under construction. The blue lines represent the grade separated portion designed by the state and the red lines represent the street improvements designed by the city of Seattle. North is oriented to the right. Containers at Terminals 37 and 46 can be seen at the top. Safeco Field (Mariners) and the football stadium (Seahawks) are depicted in the middle of the photo

These projects will alleviate congestion and improve access to the container terminals. Traffic congestion in other areas is shown in Figure 7.

Currently, the State is focusing on improvements to I-405 in order to relieve the pressure of congestion. In June 2006 northbound lanes of 405 in the Totem Lake area of Kirkland were opened with newly added ramps and bridges allowing buses and HOV passengers to enter and exit the freeway without crossing three traffic lanes, ensure greater safety and traffic movement. The state is debating a bill for a \$1 billion project to widened interstate 405 with two lanes in both directions between Renton and Bellevue. Just as in Kirkland project, Sound Transit is partnering with the state to fund the construction and add needed infrastructure, such as bus stations and car pool lanes.



Figure 8. Points of congestion

Infrastructure needs of the City of Seattle

According to a recent report issued in May of 2004 by the Citizens Transportation Advisory Committee, (CTAC) Seattle’s local transportation system is overburdened and under funded and the City needs new tools to help address this disparity. The Mayor and City Council adopted Resolution 30604, forming the Citizens’ Transportation Advisory Committee (CTAC-II). The charge to the 12-member committee was to evaluate and make recommendations for new sources to fund major transportation maintenance and neighborhood transportation needs. The committee concluded that 16 percent of Seattle’s major streets are in poor condition or worse and 37 percent of the City’s bridges are in poor condition or worse. Of course, the longer the delay on maintenance, the greater the cost of repair.

“It’s clear that Seattle has two big problems – our infrastructure is in serious need of repair and the city needs additional funding to make the repairs,” said committee chair Darryl Smith, a Columbia City realtor. “The recommendations in the CTAC report will work to address these concerns.” (City of Seattle, 2004)

“This report is a wakeup call that the Legislature needs to take,” said Mayor Greg Nickels. “Clearly there are huge needs and few choices to address transportation funding shortages.

We need the State Legislature to provide us with new funding options.” (City of Seattle, 2004).

“CTAC II has sounded the alarm. We must respond to their recommendations and leave no stone unturned to find new local resources,” said Councilmember Richard Conlin, chair of the Transportation Committee, which received the report today. “But, this will not be enough. Cities across the state are in dire straights and need new ways to fund our streets and bridges. We must work with the Legislature to find the tools to meet crucial local transportation infrastructure needs.” (City of Seattle, 2004)

Among the committee’s findings:

The backlog of deferred maintenance for Seattle streets, arterials, bridges and sidewalks is currently about \$500 million. Maintenance costs alone to reduce the backlog would require about \$40-\$50 million in additional funding each year over the next 20 years. Seattle Department of Transportation should be replacing one bridge every year, but current funding allows replacement of one bridge every 3 or 4 years. SDOT would need to triple the annual amount of paving and reconstruction in order to reverse the net deterioration of streets.

Since 1990, the City has actually lost transportation revenue sources, while the need for transportation infrastructure maintenance and improvement is growing. As the condition of the transportation infrastructure deteriorates, it becomes significantly more expensive to repair or replace – effectively doubling every 10 to 15 years. Today, 16 percent of arterial streets are in poor condition or worse. Although the condition of local streets is not compiled, it is probably at least as bad. Of the 138 bridges in the City, 37 percent are in poor condition or worse – most of these are more than 60 years old. Currently 16 bridges have weight restrictions due to critical deficiencies. Many traffic signs and control systems need replacement or upgrading.

Congestion

Highway Congestion

According to a recently published report by the Texas Transportation Institute, Seattle now ranks as the 11th worst US metropolitan area for traffic congestion. However, the Reason Foundation estimates that Seattle-Tacoma will be the 8th most congested city in the U.S. by 2030 (Hartgen, Fields & Poole, 2006)

Table 3. Top Ten Most Congested Cities in the US by 2030

TOP 10 CITIES IN THE U.S.		
City	Population in millions	Delay in hours
Los Angeles – Long Beach	15.654	1.94
Chicago	9.522	1.88
Washington D.C	5.922	1.87
San Francisco	5.973	1.86
Atlanta	4.968	1.85
Miami	5.009	1.84
Denver - Aurora	7.551	1.80
Seattle-Tacoma	3.210	1.79
Las Vegas	3.963	1.79
Minneapolis – St. Paul	2.437	1.76

"It's not going to surprise anyone," said Rick Olson, a spokesman for the Puget Regional Council, a planning agency. "No matter how you cut it, congestion here is bad and it's getting worse." The institute, based at Texas A & M University, also found that the average cost of congestion in lost wages and wasted fuel for the Seattle-Everett area driver was an average of \$930 in 1999, second only to Los Angeles, where it was \$1,000. The average in No. 3 Atlanta was \$915. (Foster, 2001)

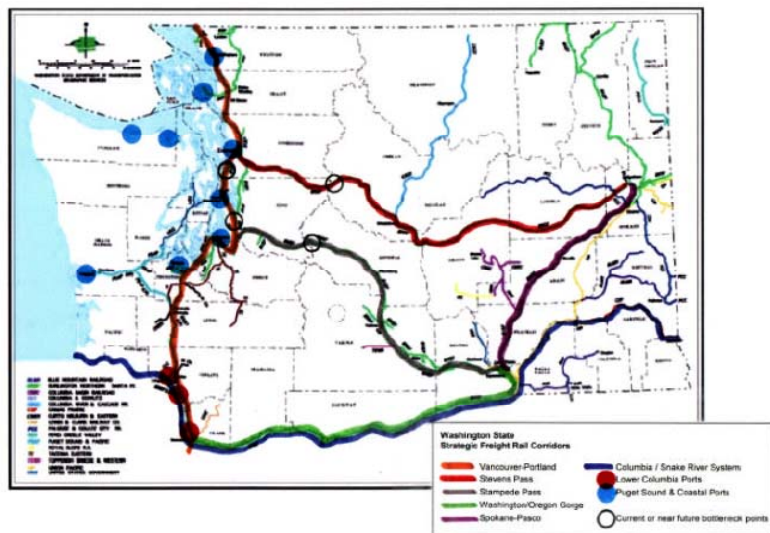


Figure 9. Projected Rail Bottlenecks (Young, et. al. 2001)

Container and Port Activity in the Future

Seaport container volume has grown from 1.2 million TEUs in 1990 to nearly 2.1 million in 2005. Beyond that, port officials say the container business is poised for steady growth as the amount of international trade is expected to grow at 1.5% per year. "The container business is continuing to grow," says Stephen Sewell, managing director of the Port of Seattle's marine division. "More than 90 percent of international trade is carried on ships. People don't recognize that. They don't realize that most of the things they wear and the things they buy are made overseas." (Bond, 2001) Some estimate that the port has the property on which to build facilities to increase its capacity to 4 million containers a year and vacant land that could be developed on Terminal Island and other locations to increase capacity further. There is also the possibility of expanding the port to 1500 acres north of the existing container terminal.

The WPPA/WSDOT Marine Cargo Forecast indicates that a total of more than 33 million metric tons of freight moved through the Puget Sound ports in 2004. One rather conservative estimate is that the rate of cargo growth through the year 2020 is expected to average 1.5 percent per year. At this rate, 44 million metric tons of freight will move through these ports in 2020.

On a given day, more than 800 semi-trucks go through the gate at the Port of Seattle's Terminal 18 to drop off containers for shipment or to pick up newly arrived containers. As one of the busiest ports in the United States, it's a scenario repeated countless times at each of the four container and two rail intermodal terminals in Seattle. "Nearly three-quarters of the cargo moving through Seattle is discretionary – it's destined for somewhere else, and shippers don't have to bring their freight here," Sewell said.

The FHWA estimates that for every 10 containers carried on intermodal rail, a minimum of seven trucks are taken off the highways. (FHWA, 1996) A single intermodal train can take as many as 280 trucks off the highways. (AAR, 2004) In addition to helping reduce traffic on the Nation's heavily congested highway network, transferring goods from highways to rail and port also helps to improve roadway safety, reduce the rate of highway pavement deterioration and the costs of highway maintenance, and reduce fuel use and air pollutant emissions.

Table 4. Mode Share for Freight through Puget Sound Ports

Mode	1997 mode share	Tonnage (million metric tons)	Projected 2020 mode share	Tonnage (million metric tons)
Rail	25.7%	21.91	30.8%	37.18
Barge / Raft	0.5%	0.40	0.4%	0.50
Truck	29.3%	24.97	29.7%	35.91
Direct moves at plants	44.6%	38.02	39.1%	47.23
		85.30		120.82

In 1997 the largest share of waterborne traffic by bulk volume on Puget Sound, 38 million tons, was handled directly at the plant. This cargo consists mostly of crude oil, sand and gravel, limestone, gypsum and other bulk materials, with domestic receipt of Alaskan crude oil by refineries accounting for the largest share. The other modes carried 47 million metric tons of cargo. (Young, et. al., 2001).

Seaport Competition

Individually, Long Beach handled 6.7 million TEUs and Los Angeles 7.4 million, more than Seattle (2.08 million) and Tacoma (2.06 million) combined. According to Pacific Maritime Association study, Long Beach has increased its container averages from January 1993 to April 1997 by an impressive 85.6 percent, Los Angeles by a much smaller 19.6 percent. However, in recent years both ports have seen a much diminished growth percentage. While, Seattle posted a 24.7 percent increase in the same time period, however subsequently experienced an 8.2 percent reduction in 2000 from what they were when they peaked in June 1995. Tacoma, meanwhile, showed only a 2.8-percent increase in the 52-month period. Fortunately, both Seattle and Tacoma ports have experience another surge in container traffic in the last two years. Despite the fact that Seattle-Tacoma together form the second-largest load center in North America, the gap behind both Long Beach and Los Angeles is still extremely wide. (Port of Long Beach, 2006; Port of Los Angeles, 2006; Port of Seattle, 2006; Port of Tacoma, 2006).

Over 70 shipping lines call at the Northwest's largest port, which houses ten shipping terminals and spans 3,200 acres. Officials from both ports are concerned about a continuing loss of market share to Long Beach, the nation's second busiest container port, and neighboring Los Angeles (Port of Long Beach, 2006).

Another source of competition from other ports has to do with labor issues. These will be discussed in more detail in a later chapter, however, the productivity issues surrounding a skilled labor force can create a competitive advantage for Asian, as compared to domestic port operations. The Port must deal with union longshoremen not afraid to slow down production if they don't get what they want. Labor relations have been made even more tense by several lawsuits filed recently by women and minority dockworkers, who find they are not yet welcome in an industry long dominated by white males.

Competition with Tacoma

In 1997, Tacoma's port hired Seattle's No. 2 executive, Andrea Riniker, to be its new executive director, with a salary of \$140,000 a year. Riniker, Director of the Port of Tacoma, believes a "healthy competition" between the two ports will help both in their battle against the Southern California and Vancouver ports. Most observers agree. Yet some say if that includes raiding each others' shipping lines and personnel, it won't be so healthy. According to Riniker, if cramped Seattle cannot satisfy Hanjin Shipping Co. and NYK Line in their

desire to expand, those shipping lines should relocate in more spacious Tacoma. Hyundai Merchant Marine Co. did so after its new terminal was finished by mid-1999. "I think it's in the region's best interest for us to put the best facility at the best price in front of a customer," she says. "Maybe there is a way to talk about who has that best facility." Riniker, has recently announced her intention to step down as executive director. Speculation suggests that Deputy Executive Direct Tim Farrell will be her successor (Port of Tacoma, 2006)

Seattle offers four container terminals totaling 501 acres along Elliott Bay (Port of Seattle, 2006). Tacoma, meanwhile, currently has six shipping terminals totaling 580 acres along Commencement Bay (Port of Tacoma, 2006). Both ports have on-dock rail systems for some of their terminals, and both have natural water depth of 45 feet or more to handle ever-larger ships. Hyundai's new facility adds 50 acres with an option for 50 more. Seattle's and Tacoma's rates are about half what is charged at Long Beach and Los Angeles, and many in Seattle claim Tacoma is undercutting their efforts to get market share -- a view that isn't shared in Tacoma.

Competition from Vancouver

Although Seattle and Tacoma have a one-day advantage for ships from Asia over Long Beach and Los Angeles, Vancouver's Deltaport is 2 1/2 hours closer than Seattle. Deltaport, was built by the Vancouver Port Corp. for \$224 million (Canadian) to double the port's limited container capacity to 1.7 million TEUs and to gain market share. Vancouver offers a total of 25 marine terminals, with three terminals devoted to container shipping. One berth can support two post-Panamax ships at a time and handle up to 600,000 TEUs a year -- 800,000 with an additional crane, Strachan says. A long term goal for 2012 is to increase container capacity to 4 million TEUs a year (Port of Vancouver, 2006). However, it has not been an easy task to persuade the shipping lines to not only stop, but set up shop at its clean and empty buildings. The Global Alliance that includes American President Lines (APL), Orient Overseas Container Line (OOCL), Mitsui O.S.K. and Hyundai Merchant Marine sends a ship here every Sunday. The second ship will come from the same group. "We're trying to get APL and Hyundai to bring at least some of their staff to our terminal," Strachan says, adding, "We're not going to be a single-user terminal. We'll take anybody."

Vancouver's two other terminals, Vancouver Terminal and Centennial Terminal, are more than 20 miles away inside the city at Burrard Inlet. Together, they occupy fewer than 140 acres and can only handle 650,000 TEUs a year, less than half Seattle's volumes. At least 20 percent of Canadian loads were going to Seattle or Tacoma when Vancouver officials decided to construct Deltaport in 1992 (Port of Vancouver, 2006).

With its on-dock rail system with four tracks and 14,000 feet of space, it can unload cargo onto to rail cars without touching the ground. The rail system has direct links to Canadian National and Canadian Pacific systems that can dispatch double-stacked trains quickly through the Rockies to Toronto and Montreal. The same rail lines can bring in grain shipments, minerals and other exports from resource-rich Alberta to Asia. In comparison to

Seattle-Tacoma, "We don't have the congestion issues and the grade-separation issues here," Strachan boasts. "The railway is right on the terminal. There's no messing with city streets."

Deltaport also has the latest load-inspection cameras and other high-tech equipment, allowing it to keep its on-site staff to about 25 people. "We're still working the bugs out of the system, and getting the longshoremen trained," says Barrie Sime, the terminal manager. At full capacity, Deltaport hopes to have ships drop off virtually all their Canadian cargo before they dock in Seattle. It also hopes to steal some U.S. business, because of easy access to the Chicago market through Canada, Strachan says. "We want a piece of the Pacific Northwest action," he says. "We're not greedy. We just want another piece of the pie."

How much of the pie they will gain remains to be seen "They're really putting the pieces together there. But beyond [Deltaport], there isn't a lot of growth potential for Vancouver," says Paul Sorensen of BST Associates, a Seattle-based industry consultant. "Vancouver's business will primarily be Canadian cargo, because it has not really developed U.S. business or international business. And Canadian railroads aren't suited to serve many U.S. markets well," adds Steve Sewell, managing director of the Port of Seattle's marine division. "But they will be a threat."

Competition from Long Beach and Los Angeles

The ports of Los Angeles and Long Beach are the first and second busiest ports in the United States, respectively. Together they form a powerful load center in Southern California that continues to take away pieces of market share from Seattle and Tacoma. Collectively the ports handled 14.2 million TEUs) in 2005, more than three times No. 2 Seattle-Tacoma's 4.14 million. While Los Angeles and Long Beach ports posted increased volumes over 2004 statistics of 2.23% and 9.6%, Seattle and Tacoma reported significant increases of 17.51% and 15%.



Figure 10. Port of Long Beach

Ships going to Long Beach-Los Angeles have direct access to 24 million people (28 million, counting Phoenix and Las Vegas), compared to 9.5 million in the Northwest (U.S Census Bureau, 2006; Wikipedia, 2006). Half of all container cargo headed there stays in the region,

compared to 30 percent in Seattle-Tacoma. And the two super-ports are well equipped to handle today's ever-larger and faster ships. "If a ship goes to the Pacific Northwest, it has 70 percent of its cargo going to the rest of the nation -- but the ship still has to come down here to reach this market. It makes sense to just come here," says Yvonne Avila, spokeswoman for the Long Beach port.

But the downside is that terminal rates there are roughly twice as high, and at least until the Alameda Corridor is finished, rail and truck cargo often gets bottled up in L.A. traffic. "Reporters tell me the Pacific Northwest is every bit as congested," counters Yvonne Avila, spokesperson for the Port of Long Beach. Moreover, ships from Asia can reach Seattle-Tacoma a day sooner than Long Beach-Los Angeles, and time is money. "It's only a day sooner from Northeast Asia, but not for southeast Asian ports such as Hong Kong and Singapore," Avila argues.

Environmental Issues

Going well beyond concerns about traffic congestion, the Puget Sound region is a place where environmental values are taken very seriously. The "Puget Sound Green Pages" website lists 90 non-governmental organizations devoted to environmental causes. Alphabetically, these range from the "Adopt a Stream Foundation," which focuses on protecting and restoring rivers and wetlands in and around Seattle to a group called "Wild Olympic Salmon" dedicated to restoring and protecting wild salmon to "create opportunities for the joyous celebration of our relationship to the art, magic and mystery of nature with salmon as teacher". These groups both reflect, and encourage, citizens of Puget Sound to place a high value on environmental conservation and its contribution to quality of life. The state of Washington enacted a growth management plan in 1990 that assists local governments in targeting certain locations for future growth and development, while limiting growth in other places deemed to be worthy of preservation or conservation.

Citizens in and around Seattle thus hold public officials to a high standard of environmental protection, with significant implications for transportation projects and policies. For example the Puget Sound Clean Air Agency, a government body responsible for monitoring and managing the region's air quality writes that the region's "... two biggest environmental challenges are transportation and business," going on to note that at the end of 1999:

Cars and trucks account for 49 percent of the air pollution in our region. Every day, people in our region travel nearly 63 million miles – nearly two-thirds of the way to the sun. There's more congestion, more traffic, and less clean air. Trying to keep our air clean and healthy in the midst of this transportation growth will be our region's largest challenge in the coming years." (Puget Sound Clean Air Agency, 1999: 6)

The Puget Sound region has had some difficulty complying with national air quality standards. Currently, the region's air quality status is "maintenance" for ozone, carbon monoxide, and particulate pollution. As a result of the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) federal legislation, any metropolitan area that is not

in compliance with air quality standards risks losing federal transportation funding, unless its transportation and air quality plans can show that future projects will bring the region into compliance. Even metropolitan areas that were previously categorized as “non-attainment”, but are now listed as “maintenance”, still face additional scrutiny for any proposed new or expanded transportation capacity projects, particularly highway projects that may increase single-occupancy vehicle use. There is continual pressure on the Port, the carriers that they serve the region, and all transportation providers in the Puget Sound region to address the environmental impact of their activities. Citizen and public interest groups frequently criticize the Port’s lack of attention to environmental outcomes. Such protest is not confined to environmental extremists. Reacting to a highway expansion plan, a recent editorial in the *Seattle Times* identified the need to “correct conditions that are currently degrading the environment and fish habitat. ... and ... to rehabilitate wetlands and streams as a part of the construction process.” A draft environmental-impact statement for public review that provided a detailed examination of environmental impacts and mitigation strategies for potential solutions on I-405 has been in preparation. (McKenna, Cothorn, Putter, Seattle Times, June 2001).

Dredging is also a very tense topic. A recent Corps of engineers study endorses dredging over 100 miles of the Columbia River to an additional depth of three feet to as much as 45 feet in some places, “We believe this project will actually improve the Columbia's habitat and environmental quality,” said Bill Wyatt, Port of Portland executive director. Reportedly, channel deepening would allow a new generation of big ships to travel inland to Portland, considered a well-positioned West Coast link between maritime traffic and railroads, and one of the nation's busiest export centers for wheat and other agricultural products. “Every foot of depth in the river is estimated to be worth about a million dollars per vessel in container cargo,” said U.S. Rep. Brian Baird, D-Wash., a longtime supporter of the project. But Dave Moryc, spokesman for the American Rivers conservation group, said uncertainty is the chief problem for salmon. “So far it's just a snapshot in time,” Moryc said of the corps' study. “We still don't really know what will happen over the long term, so moving ahead with this project with so many endangered salmon stocks is dangerous.” (McCall, 2002)

Intermodal transportation faces a credibility problem with environmentalists concerned about the impacts of mobility around, to, and from the Puget Sound region. Intermodal planners and managers need to convince the public that their work can be part of the solution to sustainable transportation in Puget Sound, rather than part of the problem in degrading the environment. Such dialogue is still in its early stages.

Workforce Development Issues

Many ports have encountered labor issues. In many cases the seaport's future also depends on improved relations between the shipping lines and longshoreman represented by the

International Longshore and Warehouse Union (ILWU). Worker slowdowns occurred at ports up and down the West Coast, after a new contract between the dockworkers and employers took effect several years ago. However, a recent article in the Seattle Times reported that “Ports up and down the West Coast are concerned about the July 1 expiration of the contract between the Pacific Maritime Association and the International Longshore and Warehouse Union. The two sides are far apart — shippers are focusing on improving productivity, and the prospect of work stoppages has been raised.” (Dunphy, 2002)

In 1997 the average dockworkers' salary jumped from \$77,000 to \$96,000 a year under the pact. But many workers were unhappy about the removal of a provision allowing them to get paid for a full day's work if they complete their work in six hours, rather than eight. (Enbysk, 1997).

Max "Make a Deal" Wisner former superintendent for Seattle-based Stevedoring Services of America (SSA) is credited with devising the system that lets longshoremen go home after they have moved a specific amount of cargo in a shift. In an environment where time is money, the incentive for fast work has been praised by shippers. Wisner says he learned to inspire and indulge but never, ever boss. "You're not going to bully these guys to go to work," he says. "They'll slow down, they'll have (mechanical) breakdowns, and they'll say there's something wrong with the cranes. And if labor doesn't work for you, you're screwed." (Fryer, Seattle Times, March 2000).



FIGURE 11. LABOR PROTESTS.

Union officials have denied there were ever any slowdowns in Seattle. But area shipping-line executives say production remains below what it has been, and leaves Seattle vulnerable to being bypassed for more efficient ports. (That doesn't include Los Angeles, which in 1997 suffered from longshoreman honoring a strike by union dock pilots.) "Labor has to get on board," says one executive, who asks not to be named. "You have other ports with workers

unloading 24 containers per hour vs. 18 to 20 here. Actually, production has improved recently to 20 or 21 [per hour]. Still, it's behind what it could be, and it's nothing close to the 29 or 30 they do in Hong Kong and Singapore . . . These workers have a monopoly, and if they don't get what they want, they slow down. The port knows they need to get labor on board." (Enbysk, 1997).

Port Commissioners must get elected to their positions. Obtaining labor support is a key component leading to voter approval of a candidate. In a recent election, the King County Labor Council endorsed a new candidate over Jack Block, a Longshore foreman and Commissioner who had the council's backing in his past five campaigns.

One reason that has been cited for the council's position change was the fact that Block voted to approve the use of private contractors to provide crane maintenance services at the port. For much of the past year, the Port had been negotiating with two unions for the engineers and electricians who provide crane maintenance, arguing that at competitive ports the work is done with one union. Unable to reach an agreement, the Port Commission earlier this year voted unanimously to allow the Port's executive director to turn over responsibility for crane maintenance to operators who lease terminals from the Port. The 35 people who now maintain the cranes could be hired as sub-contractors by the terminal operators. (Seattle Times, October 19, 2001).

Block, 67, said the labor council has rescinded its endorsement of him for not opposing the move. He reportedly indicated that the Port was losing too much money on crane maintenance. "It was a tough decision to make, but we simply couldn't afford it," he said. Block, who was previously endorsed by Pacific Coast International Longshore and Warehouse Union, among others, says that, as commissioner, he's helped create jobs. He hopes to create more by encouraging the Port to build another cruise-ship facility. (Seattle Times, October 19, 2001).

"We have not fought these changes -- we've accepted them," insists a union leader, who also asked not to be named. "The only thing we ask is that we be part of future changes." Mic Dinsmore, the port's executive director, has stepped in periodically to hear both sides and to help strengthen the delicate and often tense relationship. (Enbysk, 1997). Mr. Block lost his bid for re-election to an environmental engineer supporting airport runway expansion.

Officials of ILWU Local 19, representing Seattle Longshore workers, believe their union has been unfairly blamed for a number of ills along the waterfront -- including sexual harassment of women and prejudice against minority workers. At least eight lawsuits have been filed by Seattle and Tacoma dockworkers claiming they were victims of such abuse. In late March of 1997, The Seattle Times ran a series of articles uncovering incidents in Seattle and Tacoma of harassment, discrimination, nepotism and retaliation against those who complain about the conditions. Some Seattle port leaders were said to have welcomed the exposure of problems they previously had known little about. (Enbysk, 1997).

"We are pretty well shell-shocked by what is being said," a Local 19 official counters, though not denying any of the allegations. "There are just a lot of misunderstandings." Even though

the ports are not directly responsible for dockworkers' behavior -- the unions are -- Meyer says, "The ports are not helpless. I don't accept that, and I will never accept that. We're obliged to work on these issues, and that's what we're doing (Enbysk, 1997).

Though those who run the shipping lines and ports are fueling dramatic change, the people who load and unload cargo represent "a very traditional industry -- and maybe one too slow to change," says the Port of Seattle's Sewell. (Enbysk, 1997).

Summary

Throughout the course of this case study a number of challenges were identified:

- **Finding a tax source.** Many of the taxes being considered have problems. Polling by business and labor groups had shown that voters do not like the sales tax for roads, and some said the vote on the education initiative just reinforced that. "If you can't raise the sales tax for kids and education, you're not going to be able to use the Regional Transportation Investment District to turn around and raise sales tax for roads," Murray said. Seattle Deputy Mayor Tim Ceis said, "People have reached their threshold on sales tax tolerance." (Hadley, 2004)

But another major pillar of a transportation package, the motor vehicle excise tax, raises some potential concerns, too. The monorail is supported by a 1.4 percent motor vehicle excise tax on Seattle residents, while Sound Transit collects a .3 percent motor vehicle excise tax from residents of its district, which includes all of Seattle. That means that Seattle voters, the most likely voters in the state to vote for a tax increase and without whose support it's difficult to pass a tax, have already committed 1.7 percent of the motor vehicle excise tax to current transit programs. Meanwhile, that tax garnered the most votes of any of the hypothetical five taxes voters were presented with on the second part of the King County Advisory ballot. "One would think there would be burnout, because of the monorail, but obviously there wasn't, because it fared better in Seattle than in any other area of the county," Patterson said of the motor vehicle excise tax. (Hadley, 2004).

With gas prices surging and with the Legislature raising the gas tax a nickel a year ago, that tax is not the magic potion either. Sen. Mary Margaret Haugen, D-Camano Island, the possible new chairwoman of the Senate Highways Committee, said, "I'm not so sure that the gas tax will be the source we'll be looking at. I don't think we can raise the gas a whole lot more." Almost all mentioned tolling as a likely new direction for transportation, but studies have shown that tolls don't raise huge amounts of money, so tolling likely can only be part of the solution.

These revenues however may be insufficient because the aging monorail system is estimated to require about \$4.5 million dollars of repair work and improvements that have been accumulating over the last 16 years. At a recent city council meeting SMS submitted a request for \$4.3 million of items needing repair. The situation is becoming more critical due to the more frequent breakdown of the line. Most

recently, on August 20, at least 200 riders were stranded and another breakdown occurred the week before. (Lindblom, 2006)

- **Getting the necessary political chemistry.** Murray says the result is that he will almost certainly not be able to find pro-tax votes for transportation from suburban and rural Democratic legislators. "That means that business ... is going to have to round up more Republicans," Murray said. And that could be difficult, too, because even Murray, who had difficulty working with Horn, his counterpart in the Senate, said of Horn: "He was able to round up Republican votes to vote for a tax increase, and that was no small feat." (Hadley, 2004).
- **Getting Seattle voters to vote for roads.** Monorail supporters, MacDonald said, ran a campaign touting transit as an alternative to more cars and roads and voters appeared to respond positively to it. "We saw how many voters in Seattle feel strongly about the transit issue," he said, adding that he fears it may be a challenge to get Seattle voters to support roads. (Hadley, 2004).

Challenges

Problems and Issues

Although great strides have been made there are still many problems facing the port. These can be summarized as follows:

- Increased trade with Asia has created increased demand on the existing system.
- This port is only one sailing day closer to North America from NE Asian ports than is LA-Long Beach
- Puget Sound's expanding transportation system generates growing negative impacts on the environment and is seen as a threat to the region's quality of life by many citizens.
- Road traffic has grown considerably over the last few years and is currently listed among the top ten most congested areas
- Freight train delays of traffic are frequent
- Increased train traffic over freight routes has also caused congestion and
- Residential land use conflicts with freight traffic – local communities are protesting the train traffic through their areas
- Labor issues regarding pay and productivity need attention
- Transportation infrastructure gaps exist at points where rail, road, and sea modes intersect
- Funding intermodal developments is a perennial challenge. The state and regional economic downturn in 2001 has made infrastructure and planning funds ever more difficult to access.
- Public support is volatile

- Perception of the Seattle region as “anti-business”, based on recent events such as Boeing Corporation’s decision in 2001 to move its corporate headquarters out of Seattle to Chicago, and anti-globalization protests in Seattle at the World Trade Organization summit meetings in December 1999
- Los Angeles, and Vancouver, especially considering recent growth trends at Long Beach and Los Angeles, as well as port expansion and upgrading at Vancouver and Tacoma.
- Budgetary constraints- Planning studies have identified \$360 million in projects that would reduce congestion however, only 50% of that amount may be provided by the State of Washington, additional sources of revenue will need to be found

Implications for using the case study

Instructions for Case Analysis

Imagine that you are the incoming executive director, replacing Mic Dinsmore and you are sitting in your office preparing for your first meeting with the board of directors. As you ponder all of the information about the port and the current state of affairs of transportation in the Seattle region you itemize the many problems facing you. As you prepare for the meeting you sit back in your chair and wonder how you will deal with them and what you will say to the board.

Possible discussion questions...

How do the problems outlined in this case seem similar to those you are encountering at your locations?

What, if any, additional information do you need in order to be able to complete your analysis?

What priorities should the Board of Commissioners set to develop intermodal solutions?

What should some of these solutions look like?

What new ideas or innovations would be part of these solutions?

What financial, planning, and management tools will be needed to implement these solutions?

Pick the top three of four priorities that the board should address

Case discussion format

Each table will have at least 5 participants. Participants will discuss the general issues facing the board of directors. Participants will select a spokesperson for their group.

The spokesperson will write on the flip chart the top 5 issues that the Board of Directors should address

The group will discuss a detailed plan for solving one of the problems that they have listed

References

Association of American Railroads. Intermodal Transport. RR Industry Info Background Paper. On-line at: www.aar.org/.

Bond, J. (2001). Containing the future. Washington CEO, Supplement, July 2001.

Coad, T. (2006, February 21). Grandiose rail schemes do little to reduce congestion. *The Seattle Times*.

Cy Ulberg and Gordon MacFarland (1995). WA-RD 377.1 Evaluation of public opinion about congestion pricing and tolls. Unpublished report.

Dinsmore, M.R. (1997). We Must Unclog Puget Sound or Shippers Will Head South. Washington CEO, July 1997.

The Economic Impacts of the 2003 Cruise Season at the Port of Seattle, John C. Martin Associates, April 13, 2004. Retrieved on September 23, 2006, from http://www.portseattle.org/downloads/seaport/Impact_4_02_04%20FINAL%20_2_.pdf#search=%22The%20Economic%20Impacts%20of%20the%202003%20Cruise%20Season%20at%20the%20Port%20of%20Seattle%2C%20John%20C.%20Martin%20Associates%2C%20April%2013%2C%202004%22

Enbysk, M (1997). Seattle Seaport Maneuvering to Close the Gap. Washington CEO, Inc.

Enbysk, M (1997). Threat to the North: Deltaport. Washington CEO, Inc.

Fast Corridor: The FAST Partnership helps move our economy. (2006). [Brochure]

Federal Highway Administration, Office of Policy Development (prepared by Volpe National Transportation Systems Center). Implications of Intermodal Freight Movements for Infrastructure Access, Capacity, and Productivity. Washington, DC: Federal Highway Administration, March 1996.

Foster, G. (2002). Getting There: No easy answers for frustrating 50th St. Seattle Post-Intelligencer, *February 4, 2002*.

Foster, G. (2002). New report: Seattle's traffic second worst in nation. Seattle Post-Intelligencer, *May 7, 2002*.

Fryer, A. (2000). Crane men: Need for speed tests the waterfront's elite and their proud union *Seattle Times March 5, 2000*.

Gaudette, K. (2006, March 9) Impact of I-405 widening assessed. The Seattle Times. B3.

Hartgen, D.T., Fields, M.G., & Poole, R. (2006) Building Roads to Reduce Traffic Congestion in America's Cities: How Much and at What Cost?. The Reason Foundation. Retrieved on September 4, 2006 at <http://www.reason.org/ps346/mostcongestedcities.shtml>

Lamm, G. (2006, January 20). Doubling of Downtown's Population Foreseen. Puget Sound Business Journal (Seattle). Retrieved on September 4, 2006 at <http://seattle.bizjournals.com/seattle/stories/2006/01/23/focus3.html>.

Lindblom, M (2006) Coad, T. (2006, February 21). Grandiose rail schemes do little to reduce congestion. *The Seattle Times*.

Lindblom, M. (2006, August 29) Center's aging monorail needs \$4.5 million in fixes, official says. *The Seattle Times*

Las Vegas, Nevada. (2006) Wikipedia. Retrieved on September 23, 2006, from http://en.wikipedia.org/wiki/Las_Vegas

Martin and Associates, (2000). The Economic Impacts of the Port of Seattle.

Mayne, J. (1997). Open for Business. Washington CEO, Supplement, July 2001.

McCall, W. (2002) New Corps study backs dredging Columbia *The Seattle Times* January 04, 2002

McKenna, R., Cothorn, B., & Putter, S. (2001). Traffic-relief plan a good investment , *Seattle Times*, June 29, 2001

Phoenix, Arizona. (2006) Wikipedia. Retrieved on September 23, 2006, from http://en.wikipedia.org/wiki/Phoenix%2C_Arizona

Port of Long Beach (2006). Retrieved on September 23, 2006, from <http://www.polb.com/>

Port of Los Angeles (2006). Retrieved on September 23, 2006, from <http://www.portoflosangeles.org/>

Port of Seattle. (2003). The Economic Impacts of Sea-Tac International Airport. Retrieved on September 4, 2006 at <http://www.portseattle.org/downloads/business>.

Port of Seattle (2006). Retrieved on September 4, 2006, from www.portofseattle.org

Port of Tacoma (2006). Retrieved on September 23, 2006, from <http://www.portoftacoma.com/home.cfm?CFID=747114&CFTOKEN=52077371>.

Port of Vancouver (2006). Retrieved on September 23, 2006, from <http://www.portvancouver.com/>

Puget Sound Clean Air Agency (1999) Clean Air Choices Today for a Better Tomorrow: A Report from the Puget Sound Clean Air Agency. Seattle, WA.

Puget Sound Green Pages (2001) <http://www.wolfenet.com/~greenway/nwalpha.htm>

Schulz, T. (2006, August 21). The world's ports experience an unexpected boom. *Spiegel Magazine Online*. Retrieved September 4, 2006 from <http://service.spiegel.de/cache/international/spiegel/0,1518,433508,00.html>

Southern California. (2006) Wikipedia. Retrieved on September 23, 2006, from http://en.wikipedia.org/wiki/Southern_California

State & Country Quick Facts. (2005) U.S. Census Bureau. Retrieved on September 23, 2006, from <http://quickfacts.census.gov/qfd/states/41000.html>

U.S Census Bureau. (2006) State and Country Quick Facts: Washington. Retrieved September 4, 2006 from <http://quickfacts.census.gov/qfd/states/53000.html>

Washington State Department of Transportation (WSDOT). (May 2001). *Washington Transportation Plan: 1997-2020*. Olympia, WA.

Washington State Department of Transportation Planning Department (WSDOTPD) (1998). *Trends Analysis*. Olympia, WA.

Young, R. Walter, K., McDonald, R., and Barnes, J. (2001). Multimodal Hubs: An Option for the Washington State Infrastructure Strategy. University of Washington, Unpublished Paper. Spring 2001.

Addendum Material

FIGURE 13. SEATTLE'S TOP TRADING PARTNERS: 2004

(Ranked by Total Dollar Value)

Source: U.S. Maritime Administration Foreign Waterborne Trade Statistics

Rank	Country	Import Metric Tons	Export Metric Tons	Total Metric Tons	Import Value in Millions of US \$	Export Value in US \$	Total Value in US \$
1	China	1,719,583	1,761,950	3,481,533	\$8,670,766	\$1,199,999	\$9,870,765
2	Japan	702,170	2,728,492	3,430,662	\$6,475,240	\$2,566,725	\$9,041,965
3	South Korea	278,690	531,733	810,423	\$1,479,341	\$643,522	\$2,122,863
4	Taiwan	264,673	1,283,984	1,548,657	\$1,148,443	\$436,108	\$1,004,264
5	Hong Kong	75,800	140,313	216,113	\$765,810	\$238,454	\$1,004,264
6	Indonesia	80,157	316,913	397,070	\$605,842	\$135,496	\$741,338
7	Thailand	355,661	199,185	554,846	\$528,814	\$188,508	\$717,322
8	Malaysia	71,608	179,422	251,030	\$495,260	\$99,141	\$594,401
9	Vietnam	45,336	26,540	71,876	\$361,415	\$43,246	\$404,661
10	Singapore	26,641	77,420	104,061	\$209,933	\$158,085	\$368,018
11	Australia	56,618	70,918	127,536	\$160,506	\$174,601	\$335,107
12	Philippines	29,020	82,906	111,926	\$193,094	\$89,031	\$282,125
13	Canada	3,719,517	598,805	4,318,322	\$84,470	\$141,616	\$226,086
14	Russia	19,145	42,433	61,578	\$114,025	\$67,076	\$181,101
15	Macao	9,913	148	10,061	\$176,864	\$495	\$177,359
16	India	49,371	78,127	127,498	\$127,498	\$41,968	\$166,565
17	Bangladesh	14,296	9,961	24,257	\$146,531	\$7,880	\$154,411
18	New Zealand	81,216	20,689	101,905	\$120,736	\$30,670	\$151,406
19	Cambodia	11,386	928	12,314	\$132,438	\$907	\$133,345
20	Chile	84,841	4,553	89,394	\$100,592	\$10,254	\$110,846
Total from All 165 Partners		8,214,841	8,481,275	16,696,116	22,372,966	6,799,224	29,172,190

FIGURE 14. SUMMARY OF SEATTLE TEUS

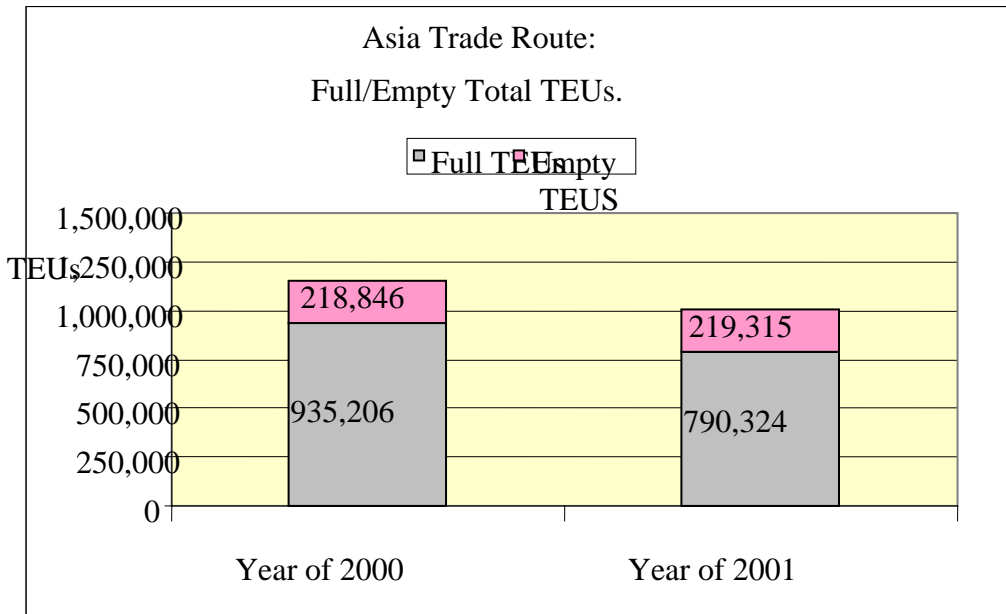


FIGURE 15. KEY CONGESTION POINTS IN THE SEATTLE PUGET SOUND REGION

FAST Corridor Phase I & II (1996-2005)

FAST PHASE I PROJECTS *Dollars in millions

Project Name	Lead Sponsor	Benefits to Freight	Status	*Funding (all sources combined)
<u>California St.</u> Everett Ave. extension & over-crossing	Port of Everett	Eliminates three at-grade crossings.	Completed	\$ 12,417
E. Marine View Dr.	Everett	Port access	Design	\$ 6,213
<u>41st Street</u> Overcrossing	Everett	Will provide direct vehicle and truck access from I-5 to a large industrial redevelopment area.	Construction (preloading)	\$ 6,274
South Spokane St.	Seattle	Port access	Awaiting full funding (utility relocation underway)	\$ 88,088
<u>SR-519, Phase I</u> Royal Brougham Grade separation	WSDOT	Increases the ability to move freight by all modes (cars, trucks & trains).	Construction of Phase 1, Design of Phase 2	\$ 87,400
SR-519, Alaskan Way	WSDOT		Design	\$ 39,650
East Marginal Way	Port of Seattle	Port access with rail elements	Design	\$ 36,733
<u>S. 180th St.</u> Grade Separation	Tukwila	Grade separation under both the BN and UP tracks.	Construction	\$ 21,992

<u>S. 277th St.</u> Grade separation	Kent/Auburn	Will increase capacity on 277th St., improving access to the valley's industrial and warehouse areas.	Completed	\$ 35,157
<u>3rd St. SW</u> Grade separation	Auburn	Will allow rail and highway movements to flow without conflict.	Completed	\$ 30,514
<u>8th St.</u> Grade Separation	Pierce County	Improves rail movement by removing a bottleneck.	Construction	\$ 12,800
Shaw Rd. Extension	Puyallup	Grade separation	Design	\$ 15,000
North Canyon Rd Extension	Pierce County	Grade separation	Design	\$ 6,000
D St.	Tacoma	Grade separation, track curvature	Design	\$ 26,550
Port of Tacoma Rd. Grade Separation	WSDOT	Frees up mainline access to the Port and allows for more capacity on the through line	Completed	\$ 30,814
SR 167 (ROW)	WSDOT	Major route improvement to serve multimodal local port freight movement and relieve truck congestion.	In permitting (ROW acquisition only within current FAST funding)	\$ 45,015

FIGURE 16. FAST PHASE II PROJECT
A \$262.8 million FAST Corridor Phase II (2003-2005/08) action package

FAST Partnership Fund Allocations 2003-04

The FAST Corridor received federal funds in 2003 and 2004. Funds were allocated to the projects listed in the table below to keep the FAST momentum going.

Project	2003 Allocations	2004 Allocations
Shaw Road (Phase 1 carry-over)	\$ 3.25	
S. Spokane Street (Phase 1 carry-over)		\$ 0.60
Duwamish ITS	\$ 1.80	
WSDOT ITS	\$ 1.30	\$ 0.60
Lincoln Avenue	\$ 0.50	\$ 0.50
70th & Valley Corridor	\$ 1.00	
S 288th Street	\$ 1.00	\$ 1.15
8th Street UP	\$ 0.65	
Total: 7 projects	\$ 9.50	\$ 2.85

The FAST Corridor Project -- Freight Action Strategy for Seattle - Tacoma - Everett --- is co-sponsored by the Washington State Department of Transportation and the Puget Sound Regional Council.

Like Phase I, Phase II is jointly sponsored by the Washington State Department of Transportation and the Puget Sound Regional Council. Phase II will emphasize freight mobility strategies that can be most effectively applied to a wide variety of geographic locations within the region, and improvements to specific corridors that offer the greatest bang for the buck in terms of improving the regional system of freight mobility. The total funding goal for FAST Phase II is \$ 262.82 million. The funds would go to 10 projects. Each project would be implemented by a lead agency from the FAST partnership.

Source: <http://www.wsdot.wa.gov/mobility/fast/FAST2.htm>

FIGURE 17. FAST PHASE 2 PROJECT LIST

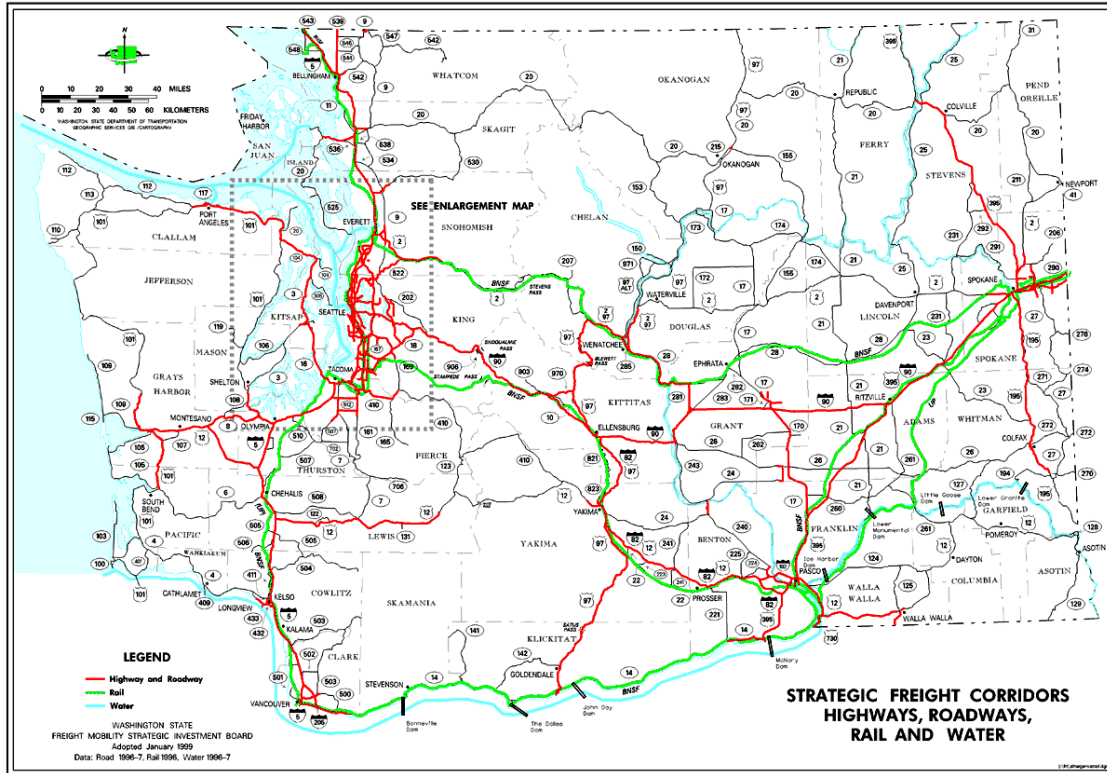
Project Name	Implementing Agency	2002 Estimated Costs (millions)
Duwamish ITS Project	City of Seattle	\$ 7.21
WSDOT ITS	WSDOT	\$ 30.00
SR 9 Widening	WSDOT	\$ 45.98
Lincoln Avenue	Port of Tacoma	\$ 26.00
S 288th Street	City of Kent	\$ 48.00
70th Street	City of Fife	\$ 18.86
M Street	City of Auburn	\$ 24.04
Eighth Street -- UP	Pierce County	\$ 20.00
Lander Street	City of Seattle	\$ 23.93
Willis Street	City of Kent	\$ 20.80
Total		\$ 264.82

FIGURE 18. MAP OF FAST PROJECTS

(Source: <http://www.wsdot.wa.gov/mobility/fast/map2.htm>)



FIGURE 19. STRATEGIC FREIGHT CORRIDORS IN WESTERN WASHINGTON



Source: <http://fmsib.wa.gov/images/corridors01.gif>

FIGURE 20. SEATTLE'S WATERBORNE TOP 30 TRADING PARTNERS: 2004
(Ranked by Total Dollar Value)

Rank	Country	Total Value in US \$
1	China	\$ 9,870,765
2	Japan	\$ 9,041,965
3	South Korea	\$ 2,122,863
4	Taiwan	\$ 1,584,551
5	Hong Kong	\$ 1,004,264
6	Indonesia	\$ 741,338
7	Thailand	\$ 717,322
8	Malaysia	\$ 594,401
9	Vietnam	\$ 404,661
10	Singapore	\$ 368,018
11	Australia	\$ 335,107
12	Philippines	\$ 282,125
13	Canada	\$ 226,086
14	Russia	\$ 181,101
15	Macao	\$ 177,359
16	India	\$ 166,565
17	Bangladesh	\$ 154,411
18	New Zealand	\$ 151,406
19	Cambodia	\$ 133,345
20	Chile	\$ 110,846
21	United Kingdom	\$ 93,388
22	Germany	\$ 83,416
23	Netherlands	\$ 44,980
24	Israel	\$ 41,647
25	Sri Lanka	\$ 36,651
26	France	\$ 36,518
27	Pakistan	\$ 34,695

Rank	Country	Total Value in US \$
28	Norway	\$ 22,441
29	Spain	\$ 21,233
30	Mexico	\$ 19,788
Sub Total		\$
All Others		\$
Grand Total		\$

Figure 12. Port of Seattle Top Trading Partners.

FIGURE 21. SEATTLE'S MAJOR WATERBORNE EXPORTS TO ALL COUNTRIES: 2004
(Ranked by Dollar Value)

Rank	Commodity	Total Tons	Metric	Value in Millions of US \$	Percentage of Total US \$ Value
1	Inorganic Chemicals	30,972		\$ 573.5	8.4%
2	Industrial Equipment	70,592		\$ 541.4	8.0%
3	Oilseeds	1,469,761		\$ 403.5	5.9%
4	Grains, Cereals	2,443,050		\$ 354.7	4.9%
5	Frozen Fish	159,894		\$ 334.7	3.7%
6	Animal Feeds	989,085		\$ 233.2	3.4%
7	Beef, Pork, Poultry	135,516		\$ 215.1	3.2%
8	Motor Vehicle Parts	21,046		\$ 211.9	3.1%
9	Paper	283,651		\$ 203.6	3.0%
10	Frozen Vegetables	250,497		\$ 192.6	2.8%
11	Plastic Resins	69,362		\$ 170.1	2.5%
12	Heavy Machinery, Machines	15,870		\$ 163.3	2.4%
13	Hides	74,714		\$ 159.7	2.3%
14	Electrical/Electrical Equipment, Parts	10,036		\$ 154.1	2.3%
15	Engines	11,573		\$ 143.5	2.1%
16	Organic Chemicals	37,990		\$ 110.2	1.6%
17	Foodstuffs (Nes)	68,802		\$ 107.1	1.6%
18	Mfg. Metal Products	14,599		\$ 90.3	1.3%
19	Apples	124,372		\$ 88.6	1.3%
20	Petroleum Distillation Products	469,005		\$ 88.3	1.3%
21	Tobacco	12,649		\$ 88.0	1.3%
22	Non-Ferrous Ores	101,924		\$ 82.4	1.2%
23	Measuring, Controlling, Sci. Instr.	2,263		\$ 73.1	1.1%
24	Photographic Equipment, Supplies	7,255		\$ 69.5	1.0%
25	Glass	23,499		\$ 67.4	1.0%
Sub-Total		6,897,977		\$ 4,919.8	72.4%
All Other		1,583,298		\$ 1,879.4	27.6%
Grand Total		8,481,275		\$ 6,799.2	100.0%

Data Source: U.S. Maritime Administration Foreign Waterborne Trade Statistics