



Port of Portland

Terminal 6 Container Business Strategy

Final Report

14 February 2018

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Appendix A Industry Leader Committee Comments and Testimony

1. Executive Summary

1.1 The Assignment and Overview

The Port of Portland (Port) hired the Advisian WorleyParsons consultant team and its subcontractors (IHS-Markit, The Beckett Group, and Coraggio Group) to undertake a business study to define the Port's future role in container shipping at Terminal 6 and to identify a sustainable business model for developing and managing this business. The Port posed six questions to be answered by this study:

- What is the Port's future role in container shipping at Terminal 6?
- What is the value proposition of Terminal 6 to container carriers and prospective container terminal operators?
- How can Terminal 6 be used to provide efficient market access for cargo shippers?
- Is there a "niche" in the direct trans-ocean container service market that Terminal 6 can occupy?
- Is it feasible to use Terminal 6 as a feeder facility to other West Coast terminals, either as a complement or an alternative to direct trans-ocean carrier service?
- What is the business model that maximizes business opportunity at the terminal but is financially sustainable, both for the Port and/or potential private partners?

A 23-member Terminal 6 Industry Leader Committee – consisting of diverse, statewide representation - was convened by the Port to provide input and guidance to the consultant team and Port leadership. The Coraggio Group facilitated the consultant-committee process.

To address the above questions, seven tasks were undertaken by the consultant team:

- Task 1 - Industry Analysis. The team reviewed changes in the industry (both ports and liner shipping) to understand current trends and how these changes might impact future container business at the Port.
- Task 2 - Market Analysis. The team completed a comprehensive review of the market that is more economically served through Portland over any other gateway. This included southern Washington and all of Oregon and Idaho. The team identified the size of the potential market using data from both PIERS and Transearch to disaggregate the data to the county level.¹

¹ PIERS is a provider of import and export data from bills of lading filed with U.S. Customs. Transearch is a planning tool that models U.S. freight flows. Both services are owned by IHS Markit, a member of the Terminal 6 study consultant team.

- Task 3 - Terminal 6 Strengths, Weaknesses, Opportunities, and Threats Analysis. A review of the strengths, weaknesses opportunities and threats (SWOT) was completed by both Port staff and the Industry Leader Committee. These two analyses were then reconciled to produce one summary of the SWOT. There were only minor differences between the conclusions reached by the consultant team, Port staff and the Industry Leader Committee, reinforcing the validity of the SWOT analysis.
- Task 4 - Operating Models. The team evaluated various operating models and the many permutations available under each one. The team looked at a port operating model, a port semi-operating model, a landlord model, and a concession model. The team also studied the variations of each model with respect to which parties provide the equipment, carry out maintenance, and assume the risks. Further, the team reviewed the various methods of engagement for an operator under the semi-operating model both in terms of what services a terminal operator might provide and how the Port might compensate them for these services.
- Task 5 - Alternatives Analysis. In conjunction with the financial analysis, the consultant team looked at alternative types of operations at Terminal 6. A stand-alone container operation, a mixed-use operation, and water feeder services to U.S. ports and Canadian ports were reviewed. Other ancillary operations such as rail shuttle, equipment receiving and dispatch, trucking, and bulk container handling were also reviewed.
- Task 6 - Financial Analysis. The consultant team conducted an in-depth financial analysis of Terminal 6 container operations, utilizing existing information on past operations and updating that data for current operations. Costs and revenues were adjusted, capital and administrative expenses were analyzed, and then administrative charges and depreciation were capped to insure Terminal 6 would be as competitive as possible.
- Task 7 - Stakeholder Engagement. During the study process, the team had five meetings with the Industry Leader Committee to review the business study tasks and invite input from the committee. The interest and engagement of the committee was integral to the process and provided the Port and the consultant team with valuable insights.
- Task 8 - Final Report. The remainder of this Executive Summary describes key takeaways from the study's tasks and ends with consultant findings and conclusions.

1.2 Task 1 - Situation Analysis

Consolidations/Mergers and Acquisitions

As evidenced by the following events in 2016-18, the trend of consolidation within the liner industry has resulted in fewer and much larger lines in all the major trade lanes:

- Hanjin Shipping went bankrupt.
- Hapag-Lloyd acquired United Arab Shipping Company.
- CMA CGM acquired American President Lines.
- China Ocean Shipping (Group) Company merged with China Shipping Group to form COSCO Shipping.

- Maersk Line acquired Hamburg Sud.
- NYK Line, "K" Line and Mitsui O.S.K Line (MOL) announced their intent to form the Ocean Express Network (ONE) in 2018, effectively becoming one line.
- COSCO Shipping announced its intent to acquire Orient Overseas Container Line (OOCL).
- COSCO Shipping is also rumored to be interested in acquiring CMA CGM.
- COSCO Shipping, Maersk Line, and CMA CGM have all made numerous other acquisitions in the past and continue to become the behemoths of the industry along with Mediterranean Shipping Company.

Rationalizations/Alliances

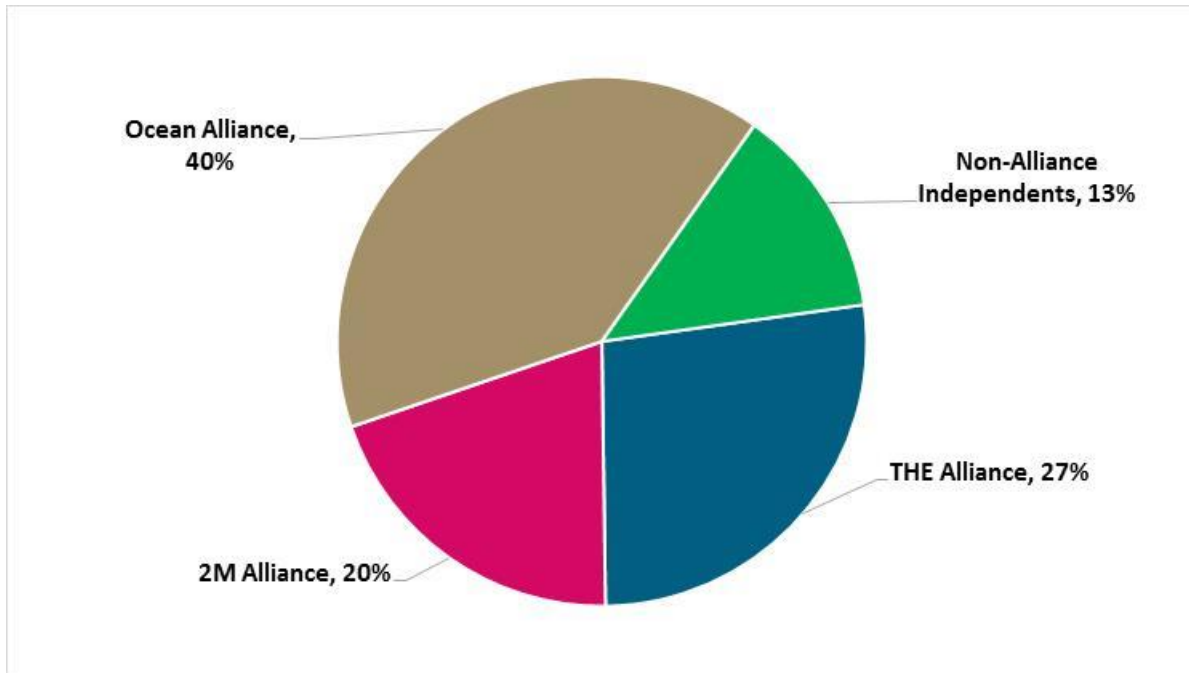
The formation of alliances by liner shipping companies is a form of asset rationalization. Multiple liner companies are putting freight on each ship in the alliance. Multiple companies are contributing ships to alliance vessel strings and the terminal assets of the member companies are also utilized by multiple liner companies. This is necessary to fill large vessels and to better control costs. Large vessels result in lower costs per container when they are well utilized, and this allows the members of the alliance to be more competitive than they could be on an individual carrier basis when operating smaller vessels.

In 2017, the four major alliances reshuffled their members and became three alliances, as follows:

- THE Alliance:
 - NYK Line
 - MOL
 - "K" Line
 - Hapag Lloyd
 - Yang Ming Marine Transport (Yang Ming)
- 2M Alliance:
 - Mediterranean Shipping Company (MSC)
 - Maersk Line
- Ocean Alliance:
 - COSCO Shipping
 - OOCL
 - Evergreen Marine Corporation
 - CMA CGM

The three alliances account for 87% of the transpacific container market (see Figure 1).

Figure 1 Alliance Share of Transpacific Container Market



In addition to the alliance groups, there are several independent carriers in the transpacific trade. They are: Wan Hai Line, Pacific International Lines (PIL), SM Line, ZIM Integrated Shipping (ZIM), Hyundai Merchant Marine (HMM), Westwood Shipping Lines (Westwood), and Matson (eastbound only). Of these carriers, only HMM and Westwood currently serve Pacific Northwest (PNW) ports.

In 2016, there were 46 transpacific services; in 2017, there were 39. More specifically, as it pertains to Portland, there were 18 PNW services in 2016 and only 12 in 2017. The 12 services to the PNW include:

- 2M Alliance – 2
- Ocean Alliance – 4
- THE Alliance – 3
- ZIM – 1
- HMM – 1
- Westwood – 1

As of today, eight of these services employ vessels of a size that could physically call Portland. However, all members of an alliance would need to agree to such a call as the alliances' governing boards control the routings and terminal selections for the carriers. It is important to remember that alliances exist to maximize profit and control costs, not to improve service. The result is that the Beneficial Cargo Owners (BCOs) have fewer choices of carriers, fewer choices of routes, and less visibility of the physical movement of the cargo (i.e.,

which ship cargo goes on or which terminal cargo will come through). It is more likely that Portland would be attractive to one of the independent lines operating smaller vessels.

The longer-term issue is that transpacific carriers are in the process of upsizing their fleet – 10,000 twenty-foot equivalent units (TEUs) and larger. Due to the depth constraint of the Columbia River navigation channel, the largest container ships that can call Portland are 5,000 to 7,000 TEUs in size. As larger vessels are cascaded in the transpacific vessel strings, the number of ships of a size that could or would call Portland will diminish.

The quest for lower cost structures has resulted in the acquisition of newer, larger vessels that require carrier rationalization and cooperation to maximize vessel utilization. That trend is continuing at a rapid pace. The vessel order books of the carriers include 158 new builds from 2017 to 2019. Although some of these vessels are small (<2,500 TEU), nearly 85% of current orders are for vessels above 10,000 TEU. Almost no ships of the 5,000 -7,000 TEU size are being built. It is likely that none of the 2,500 TEU vessels will be deployed in the transpacific trade lanes and instead will be used for intra-Asia or intra-Europe trade lanes.

The trend toward larger ships in the transpacific will continue and there will be limited opportunities for Portland to attract a transpacific service due to vessel size limitations. Alliances control almost 90% of the transpacific freight. This is not a favorable condition for a smaller port like Portland.

1.3 Task 2 - Market Analysis

Through an analysis of PIERS data and utilizing Transearch to disaggregate the data to a county level, the consultant team estimated that the market more economically served over Portland than any other gateway was approximately 225,540 loaded containers or 406,000 TEUs, of which 58% was export cargo and 42% was import cargo. In addition to the loads, there are movements of empty containers to balance the difference between imports and exports, which the team estimated to be 20% of the number of loads thereby creating a total market of 270,648 containers or 487,166 TEUs. This is based on 2014 data, which was the last full year of container service in Portland. In that year, the Port of Portland handled 195,000 TEUs or 40% of the market potential. While a market of this size is not insignificant, it would be the smallest market on the U.S. West Coast to be served by a direct transpacific liner call.

The other key finding of the market analysis was that approximately 90% of the Portland container market is coming from or destined for Asia. This underscores the importance of attracting a weekly transpacific carrier. While the Port might attract other niche carriers, the only way to achieve the volume required to sustain operations at Terminal 6 is to attract a weekly transpacific carrier. This task is made more difficult when considering that 87% of the transpacific cargo is moving on alliance carriers and that alliance carriers account for 146 of the 158 new builds between 2017 and 2019.

As part of the market analysis, the consultant team also looked at other ports of a similar size to determine if there were any lessons to be learned for Portland. The team reviewed operations at San Diego, Port Hueneme, and Philadelphia. In all three cases, proximity to larger population centers contribute to the success of the port. All three also have anchor tenants and focus on large volumes of refrigerated cargo or other niche cargo. In the case of Philadelphia, there has been large subsidies for dredging (\$392 million) and infrastructure that have greatly benefited this port.

1.4 Task 3 – Terminal 6 SWOT Analysis

The SWOT analysis was done by conducting two separate seminars and then reconciling the results of both. The first was done with members of the Industry Leader Committee and the second was done with key members of the Port staff. While there were minor differences between the two, the results were largely the same. The combined SWOT indicated that Portland's strengths as a container port are its connectivity to inland transport (barge and rail), its turnkey infrastructure, the lack of competition being the sole large container terminal in Oregon, strong shipper support, and land availability in the region and at the port.

Weaknesses included location challenges that result in higher costs for vessel diversion and for steaming time up the river, the perception of labor as undependable and unavailable, the demonstrated history of operating losses resulting in an unsustainable business model, the market size, and political obstacles due to environmental concerns or community protections.

Opportunities that were identified were the strong public interest in a container facility at Terminal 6, the ability to attract niche services, inland barge connectivity, an on-dock intermodal rail yard, truck connectivity, a strong regional economy, and continued demand for service. It was also thought that the lack of current business created an opportunity for innovation and to try new technologies.

Threats were identified as the unpredictability of labor; costs to attain profitable, sustainable operations; the alliances and consolidations of carrier services; re-attracting cargo interests that have developed new supply chains in the last three years; underutilized terminals in Seattle and Tacoma; and, lastly, increasing ship size.

1.5 Task 4 – Operating Models

The study examined four types of port operating models:

- In the **Port Operating Model**, a public port authority directly owns and operates the terminal and is fully responsible for all management aspects and customer satisfaction. Most notably, the port directly hires longshore labor. The port has 100% of the operational and financial risk under this model.
- In the **Semi-Operating Port Model**, the port contracts part of the operation to a terminal operator. The range of what is contracted can be as simple as payroll services only to contracting the entire management of all aspects of day-to-day operations. The port still owns the terminal but has less control and still has the majority of the risk (mostly financial and customer satisfaction). The terminal operator is compensated within a range, from a fixed fee to a cost-plus contract. A key component of this model is who purchases the equipment and a contractual understanding of how the equipment is maintained.
- A **Landlord Model** is when the terminal is leased out to a carrier or a terminal operator on a long-term basis and the carrier or terminal operator performs all or most of the operations within the leased area. Variations of this model include equipment ownership, equipment maintenance, and terminal maintenance. Depending on the final terms negotiated, the port has little control over the operation and a reduced amount of risk as compared to the port operating or semi-operating models. Typically, long-term container terminal leases run between 20 and 30 years with options to extend.
- In a **Concession Model**, a port offers a long-term concession to a tenant, usually 25-50 years or even longer depending on the initial development investment required. This model usually requires the tenant to offer a concession fee up front as well as to provide the equipment and all capital improvements to the

terminal area. Usually the concessionaire is responsible for all maintenance activities and the Port has no exposure to maintain any assets. The Port effectively has no control over operations and little financial or operational exposure.

As Portland is unlikely to attract a long-term tenant or concessionaire due to the size of the market and the recent operating history of the terminal, the Port will have to be either an operating or semi-operating port. Since the Port is not a Pacific Maritime Association (PMA) member, and does not want to become one, it will have to hire a terminal operator at least for payroll purposes.² The Port no longer has extensive internal container terminal operating expertise and, therefore, the team concluded that the Port should hire a terminal operator to manage the operations on a day-to-day basis with the Port providing operational and financial oversight. The consultant team further concluded that the contract with the terminal operator be a fixed fee type of arrangement with key performance indicators that need to be met. In this way, the Port can maintain some control over costs and productivity and hence reduce the financial and customer satisfaction risks to the Port.

1.6 Task 5 – Alternatives Analysis

As part of the Alternatives Analysis, the consultant team reviewed other container and non-container uses for Terminal 6. The team did not, however, study the commercial viability of attracting other non-containerized commodities to the terminal as this was outside the scope of the study.

The team also looked at a water feeder service for Portland cargo to either Seattle/Tacoma or Vancouver, B.C. Seattle/Tacoma options are too expensive due to needing to use a U.S.-built, U.S.-crewed feeder vessel. While a foreign-built, foreign-crewed vessel could be used to Vancouver, B.C., it still requires handling the box three times to get it onto a ship in Canada and the resulting costs are prohibitive.

The rail intermodal shuttle to Seattle/Tacoma is a viable option and has been done by Northwest Container Services from Portland for many years. The consultant team believes the BNSF Railway (BN) service from the intermodal yard at Terminal 6 can be successful and can help defray some gate and yard costs for container vessel operations. The new laws regarding electronic logs will enforce the rules regarding driver hours and should contribute to the success of the BNSF Railway operation. In conjunction with intermodal shuttle service, Terminal 6 can also offer equipment pooling services that could be helpful during the start-up period of container vessel operations.

Container bulk handling might be another semi-container/mixed-use option and should be explored. In this type of operation, bulk cargo comes into the terminal by rail in specialty containers. A specialized spreader is attached to the container crane and the crane both lifts and turns the container over and dumps the cargo into the hold of a bulk carrier at the dock, thereby controlling dust, etc. This type of operation is used in mining and agriculture in Australia and South America.

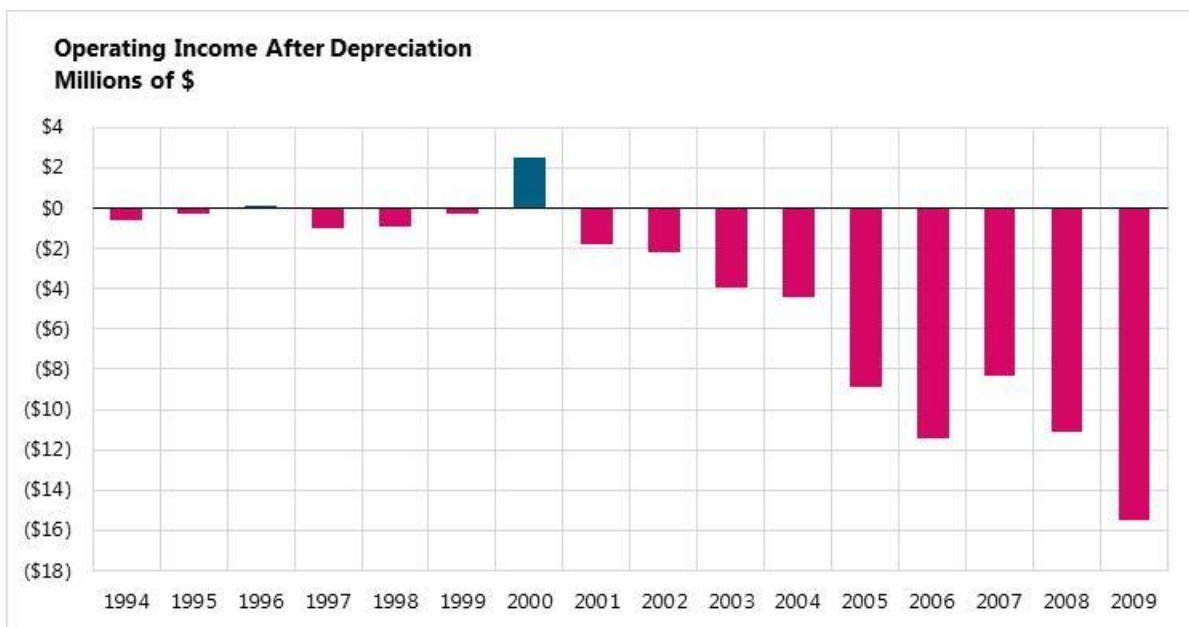
² The PMA is an industry association of shipping lines and terminal operators with 78 members. The PMA negotiates and administers maritime labor agreements with the International Longshore and Warehouse Union (ILWU).

1.7 Task 6 – Financial Analysis

This task utilized past cost and revenue information from the Port for Terminal 6 and included assumptions to update that information to current operating models recommended from Task 4. By doing this, the consultant team analyzed the circumstances required to operate the terminal in a financially sustainable manner.

It is clear from studying past performance that the three keys to financial sustainability are volumes, rates, and operational productivity. From 1994 through 2004, the terminal averaged 163,000 vessel moves per year and from 2005-2010 the average was only 121,000 vessel moves per year. The terminal only experienced positive net income in 1996 and 2000 (Figure 2).

Figure 2 Financial Performance, Terminal 6 Container Line of Business



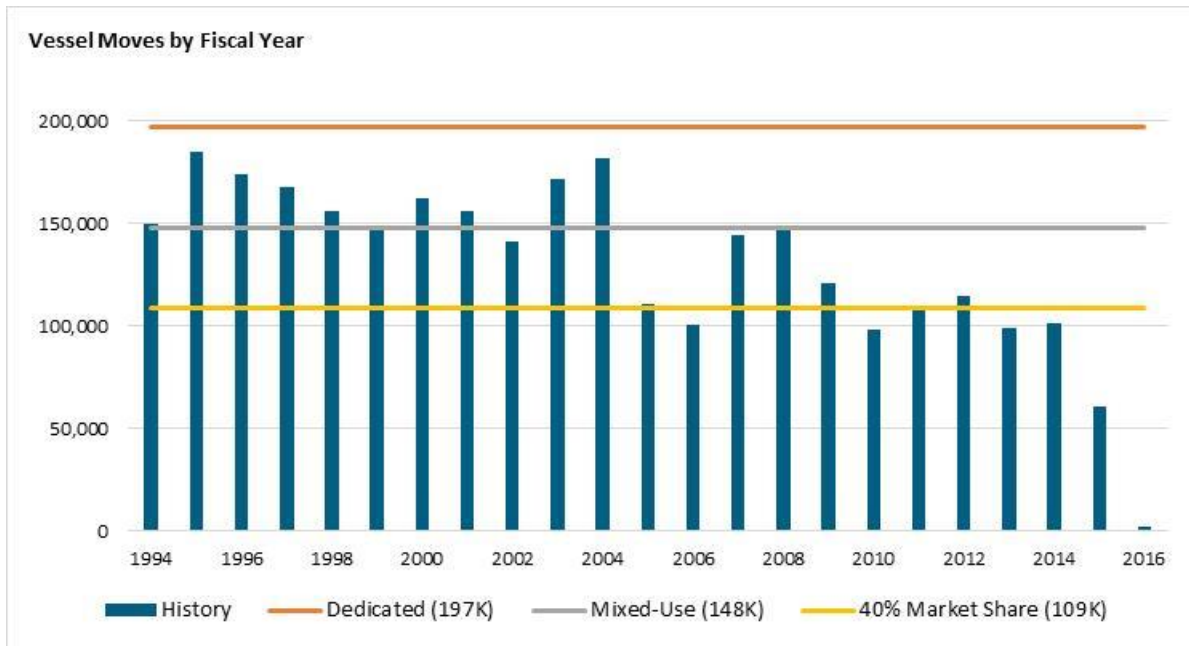
Assumptions regarding terminal productivity and pricing were incorporated into the analysis. Productivity is assumed at 2006-2009 levels in three major categories: vessel, gear-locker, and gate/yard operations. To establish current pricing levels for the mode, the consultant team analyzed past revenues per vessel move and then adjusted those rates to current dollars. The corporate support services expense was capped to bring that expense in line with expenses that a private terminal operator might allocate to terminal operations of this size and type. Depreciation was also capped, on the assumption that major capital expenditures to upgrade or expand the terminal will not be needed in the foreseeable future.

The consultant team modeled both a dedicated container terminal scenario (container vessel-related operations only) and a mixed-use terminal scenario (rail feeder and breakbulk operations in addition to container vessel operations). The mixed-use scenario assumes that part of the 52-acre intermodal yard and that 30 to 50 acres of Berths 603-604 would be used to handle rail feeder and breakbulk operations. Container vessel operations would use approximately 50-60% of the Terminal 6 footprint.

The results of the financial modeling indicate that 197,000 annual vessel moves are needed to reach a break-even point in a dedicated container terminal scenario while 148,000 annual vessel moves are needed to break

even in a mixed-use terminal scenario. The mixed-use terminal scenario includes profits from the non-container cargos. The 197,000 annual vessel moves are higher than ever experienced in Portland. A volume of 148,000 annual vessel moves has been reached in the past, though only one time in the past 10 years (see Figure 3).

Figure 3 Break-Even Volume vs. Past Volume



These results are based on an inflation-adjusted price level that assumes rates charged to carriers have kept pace with longshore cost increases. This might be an optimistic assumption as per box revenues failed to keep pace with expenses during the latter years of the Port’s operation of the terminal. The results also assume there are revenues from non-container cargo. The break-even volume of 148,000 vessel moves in a mixed-use terminal scenario also represents capturing about 54% of the available market. This level of market share has been experienced in the past, but may be difficult to achieve in the future due to changes in the industry and marketplace.

1.8 Task 7 – Stakeholder Engagement

The 23-member Industry Leader Committee provided industry knowledge and guidance to the consultant team and Port leadership on the Port’s future role in container shipping at Terminal 6, and a sustainable business model for managing and developing the container business.

The committee included diverse, statewide representation from: shippers (exporters and importers), service providers (freight forwarders, railroads, barge and trucking industry), carriers, ports, labor, and legislators with strong shipper interests. The committee met five times between June 2017 and December 2017 with the consultant team and Port management. Meetings were facilitated by the Coraggio Group.

Committee members remained deeply engaged throughout the process and provided guidance and insight to the consultants and Port management. The committee expressed strong support for the return of Terminal 6 container and barge service and a recognition of Terminal 6's importance to the state from a market access and economic perspective. The committee supports the Port's business strategy of investing limited funds associated with prior lease termination to ready the terminal for long term container service, while pursuing near term business opportunities that serve regional shippers and build confidence in the productivity of the terminal. To recover transpacific container service at Terminal 6, the committee underscored the importance of engaging all parties (shippers, stevedores, labor, Port, service providers, state government, and other leaders) in this endeavor. Members of the committee expressed interest in participating in an ongoing shipper committee to provide support for Terminal 6 container service marketing and other business activities.

1.9 Findings and Conclusions

1.9.1 Findings

The following summarizes the consultant team findings for each of the six Terminal 6 business study questions.

What is the value proposition of Terminal 6 to container carriers and prospective terminal operators?

Terminal 6 offers a built-out facility, berth availability, strong local support, a pool of cargo, limited competition, and an expectation of labor cooperation.

What are the negatives regarding the value proposition of Terminal 6 to container carriers and prospective terminal operators?

The shrinking supply of container vessels in the transpacific trade small enough to handle the draft restrictions on the Columbia River, the cost and time associated with a Portland call, and a relatively small cargo market present challenges to container operators.

How can Terminal 6 be used to provide efficient market access to cargo shippers?

A direct vessel call at Terminal 6 is the best option for local shippers. Terminal 6 can also help provide efficient market access to shippers by offering rail feeder and equipment pooling services.

Is there a "niche" in the direct trans-ocean container service market that Terminal 6 can occupy?

Terminal 6 could attract an independent carrier with smaller vessels in the transpacific service and possibly attract a South American or Australian carrier. Other niche ports analyzed had anchor tenants, a larger population base close by, and government funding. Examples of viable niche trades for Terminal 6 could be a focus on the movement of refrigerated cargo and/or a focus on the fruit/produce trade between North and South America where vessel sizes are a good fit for the Columbia River.

Is it feasible to use Terminal 6 as a feeder facility to other West Coast terminals either as a complement or an alternative to direct trans-ocean service?

A Terminal 6 vessel feeder operation would likely not be feasible due to the high cost of a U.S. flag vessels and U.S. crew requirements pursuant to the Jones Act. Feeder services to Vancouver, B.C., would be more reasonable but the cost of handling the box three times would be prohibitive.

What is the business model that maximizes the business opportunity at the terminal but is financially sustainable, both for the port and/or potential private partners?

The most viable business model for Terminal 6 is a mixed-use facility with the profits from non-container operations used to help support the container business.

What is the Port's future role in container shipping at Terminal 6?

Terminal 6 has a potential future as a mixed-use facility including niche container services, general cargo and intermodal rail. Revenue from the mix of uses would be necessary to help support a return of weekly transpacific service where the Port is exposed to a much higher degree of operational and financial risk. The Port would need to be a semi-operating port and would need to generate sufficient volume necessary to cover the significant fixed costs of the operation.

1.9.2 Conclusions

In the last decade, there have been significant changes in the container industry marked by bankruptcies, consolidations and new shipping alliances as well as increasing vessel sizes and competition. The future looks much the same, underscoring the consultant team's conclusion that Terminal 6 will not be able to compete with so-called mega-ports on the West Coast. Terminal 6 is not likely to see a return of weekly transpacific container services by multiple carriers. The Port is best advised to diversify operations at Terminal 6, using revenue from a multi-use business model to help support future container services.

Ships will continue to increase in size in the transpacific trade and this will limit the number of lines that are able to call on Portland. A weekly transpacific service is essential as the Asian market represents nearly 90% of Portland's volume. Even if a transpacific service is obtained, financial success is not assured as the volume requirements are significant. If all goes well, achieving financial sustainability will require that terminal rates are commensurate with operational and labor costs – something that was not achieved in the past. Volumes needed to break-even are high under the dedicated terminal scenario and may be challenging to achieve even in a mixed-use scenario. Financial sustainability will be challenging to achieve even in a mixed-use terminal scenario. Volumes from 2010-2014 averaged 104,000 vessel moves and almost 150,000 vessel moves are needed to break even in the mixed-use terminal scenario. Revenues and profits from non-container vessel operations are essential to the success of Terminal 6. Assumptions regarding labor productivity in the yard/gate, gear-locker and vessel crane operations must be met and maintained. Shippers have established new supply chains and they must be convinced to change back to Portland which they will only do if they believe Terminal 6 service is sustainable.

With all those obstacles, securing the return of weekly transpacific service is a high bar in the current industry paradigm. The reason for pursuing this is to achieve the Port's mission of providing market access to regional importers and exporters. The Port should target weekly niche transpacific service by independent or alliance container carriers with vessels in the transpacific rotation that can transit the Columbia River channel. To recruit and maintain this service, the Port will need the strong support of the regional shipping community, service providers, labor, and government.

2. Tasks 1 and 2 - Situational Analysis and Market Analysis

2.1 Objectives

The Port of Portland (Port) has embarked on a process to understand its future role in container shipping and to pursue a sustainable business model for managing and developing its future container business.

The objectives of this study were to provide Port management with the research and analytical resources to evaluate the financial and operational benefits and risks of operating a container business at Terminal 6. In addition, the study would provide the Port with market analysis that can be used to understand how it might approach the management, operation, and administration of a sustainable container terminal.

This section of the report summarizes the findings from Tasks 1 Situational Analysis and Task 2 Market Analysis of the Study, analyzing the current container market, focusing on segments that are most likely to be served as well as potential customers and users of the facility.

Advisian found that there is cargo in the region, but cost and competition pose a big challenge for Portland. The “bottom line” for the Port can be summarized as follows:

- The Portland study region comprised approximately 226,000 containers or 406,000 twenty-foot equivalent units (TEUs) in 2014. The year 2014 was used as the base year as that was the last year the Port had full container service. For both 2014 and the future cargo analysis, Asia represents approximately 90% of the cargo origins and destinations, illustrating the necessity of attracting service to Asia.
- Alliances represent 87% of the transpacific cargo volumes. For a typical alliance container service, it can cost between \$7 million and \$13 million annually to add a call at Portland to an existing weekly deployment schedule. These incremental costs would need to be offset by net cargo revenue gains above these amounts.
- Alliance carriers are continuing to order large vessels and the size of the ships serving the transpacific trade will continue to increase. Most alliance carriers will be operating ships too large to call in Portland within the next few years.
- Portland has the most significant draft restrictions among large West Coast ports due to the 43-foot draft limitations in the Columbia River.
- In the Pacific Northwest (PNW), the terminals that will likely be long term “winners” are Fairview (Prince Rupert, B.C.), Husky/General Central Peninsula (Tacoma) and Terminal 18 (Seattle). The rest of the terminals must fight to stay above water, mostly due to the alliance structures and the resultant inability of the carriers to make independent decisions.
- Two terminals – Roberts Bank Terminal 2 (Vancouver, B.C.) and Terminal 5 (Seattle) – may be significant game changers if and when they come into service.

2.2 Methodology

The Advisian Team identified a series of research questions or topics for each of the components of the market analysis, as shown in Table 1.

Table 1 Research Questions for Task 2

Component of Market Analysis	Research Questions
1) Regional Market	<ul style="list-style-type: none"> a) How large is the regional container cargo market (in tonnage and/or TEUs)? b) What types of goods are being transported? What is the breakdown of imports/exports? c) How attractive is the regional container cargo market to potential carriers and terminal operator?
2) Discretionary/Other	<ul style="list-style-type: none"> a) What types of products comprise the discretionary/other container segments? b) What volumes of these segments are being moved? c) How are these products transported currently? (i.e., what is the supply chain?)
3) Container Carriers	<ul style="list-style-type: none"> a) Description of the West Coast carriers and alliances b) What factors are considered by carriers when making port selections and how important is each one in their decision-making? Factors will be prioritized. c) How does Portland fare relative to other West Coast ports based on this prioritization? d) Segmentation of container carriers and services that should be targets, potential targets, and non-targets based on Portland's attractiveness.
4) Competitor Analysis	<ul style="list-style-type: none"> a) Description/profile of PNW container terminals; including capacity, existing services, terminal operators, terminal leases. b) Identification of 2-3 ports of similar market size offering niche services. c) What makes these ports successful?

In order to answer questions from categories 1 and 2, relating to the size and nature of the regional and discretionary markets, Advisian worked with subconsultant IHS-Markit to prepare Transearch and PIERS data for the study. The Transearch and PIERS data was compared to the data from previous studies produced by the Port in order to ensure that it accurately described the specific markets.

To answer questions from categories 3 and 4, relating to the size, nature and behavior of container carriers and Portland’s competitors, Advisian carried out extensive research of websites, reports, news articles and studies published by shipping agencies, database companies (like Alphaliner), consulting firms, industry associations, and maritime agencies.

Advisian and the Port also used the Industry Leader Committee to receive input and feedback from Portland area shippers and logistics service providers. Advisian’s research findings were compared to those from previous studies provided by the Port to validate the findings and identify any areas that required additional review and/or analysis.

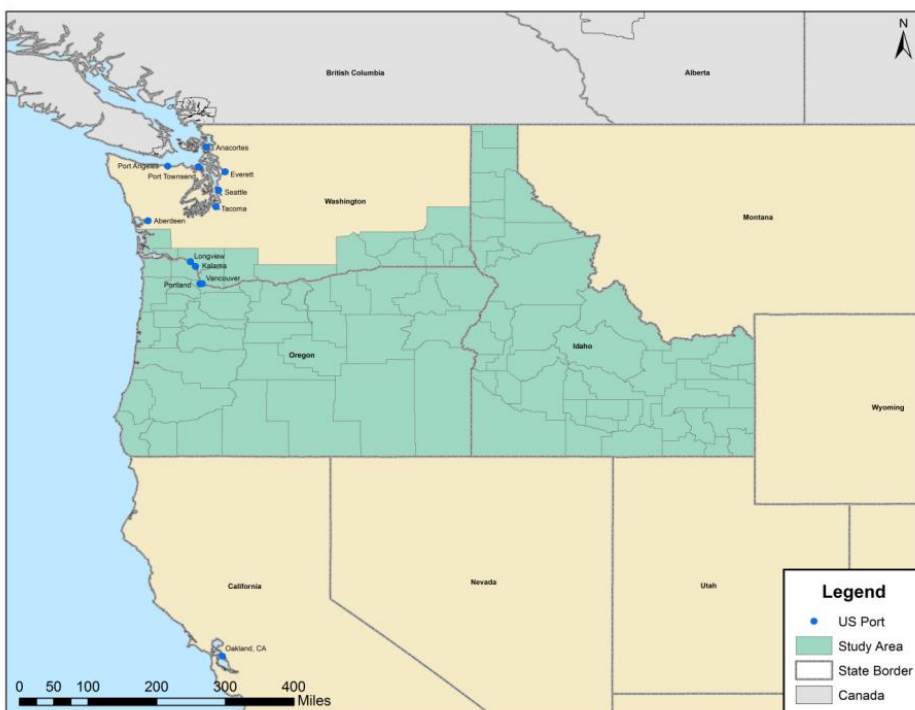
Thus, the methodology involved taking the research and the database queries and testing the results against real-world scenarios involving shippers, carriers and logistics service providers, including the Industry Leader Committee.

2.3 Regional Market Analysis

2.3.1 Definition of the Regional Market

For the Market Analysis (Task 2), the Portland market study region is defined by geographies where the direct transportation costs between the Port and the product’s origin or destination demonstrates a significant potential for lower costs compared to other container ports in the PNW. The market study region includes all of Oregon and Idaho as well as some counties in southern Washington as shown in Figure 4.

Figure 4 Port of Portland Market Study Region



Import and export data were extracted from PIERS and then disaggregated to the county level using Transearch, a database that combines proprietary industry information, numerous public data sources and actual shipping data from trucking and rail companies to represent commodity flows of domestic goods movement at the county-by-county level.³

2.3.2 Volume of Containers in the Regional Market

In 2014, the study region’s potential market for containerized cargo comprised a maximum of 225,540 loaded containers, or approximately 406,000 TEUs, of which 58% were exports.⁴ Table 2 presents a breakdown of container volumes in the study region in 2014.

Table 2 Container Volumes in Study Region - 2014

Type	Containers	Percent of Total
Total Export	130,170	58%
Total Import	95,370	42%
Total Study Region	225,540	100%

In 2014, the Port handled 195,000 TEUs or 48% of the market potential for 2014. The volumes handled by the Port of Portland included 156,000 loaded TEUs and 39,000 empties estimated to be approximately 20% of the total TEU volume. Comparing only regional loaded containers between Portland and the Northwest Seaport Alliance (NWSA), Portland would be 18% of the total regional PNW market, exclusive of regional cargo going to or from Canada.⁵

The state of Oregon had the most containers in the study region in 2014, as shown in Table 3. **Oregon’s total export container volume represented more than half of all export containers in the study region in 2014**, with Washington second at over one-third of all export containers. **Oregon dominated the import container volumes in the study region in 2014, with over four-fifths of all import containers.**

³ PIERS is a provider of import and export data from bills of lading filed with U.S. Customs. Transearch is a planning tool that models U.S. freight flows. Both services are owned by IHS Markit, a member of the Terminal 6 study consultant team.

⁴ Note: The year 2014 was selected as that is the last year in which data can be reliably obtained and it was also the last full year of container operations at the Port.

⁵ In 2014, the Northwest Seaport Alliance (NWSA) handled 1,906,200 containers or 3,427,562 TEUs which includes both empties and intermodal traffic. Empties and intermodal traffic handled by NWSA ports are estimated to be 80% of the total volume. 20% of 3.4 million TEUs equals 685,500 loaded TEUs which represents the NWSA regional market, (exclusive of empties and intermodal cargo).

Table 3 Container Volumes by State in Study Region - 2014

State	Export Containers	Percent Export Containers	Import Containers	Percent Import Containers
Oregon	71,335	55%	80,000	84%
Washington	47,225	36%	11,820	12%
Idaho	11,610	9%	3,550	4%
Total	130,170	100%	95,370	100%

Regional containerized exports and imports were primarily moved by truck (to and from the ports) in 2014, as shown in Table 4. The **truck mode dominated** the export share of containers in the study region in 2014, with negligible volume moving by barge or rail. Modal splits for import containers in the study region in 2014 were 96% of all containers moving by truck while 4% moved by rail.

Table 4 Container Volumes by Mode in Study Region - 2014

Mode	Export Containers	Percent Export Containers	Import Containers	Percent Import Containers
Truck	128,400	99%	91,920	96%
Barge	650	0%	20	0%
Rail	1,120	1%	3,435	4%
Total	130,170	100%	95,375	100%

Table 5 shows the break of imports and exports between the NWSA (Seattle and Tacoma), Portland, and Oakland. **NWSA had a combined 64% share of the study region's import and export containers in 2014**; Portland was second with 33%.

Table 5 Container Volumes by Port in Study Region - 2014

US Port	Export + Import Containers	Percent Export + Import Containers	Export Containers	Percent Export Containers	Import Containers	Percent Import Containers
NWSA	144,176	64%	95,905	74%	48,270	51%
Portland	74,620	33%	30,905	24%	43,715	46%
Oakland	6,000	3%	3,160	2%	2,840	3%
Total	224,796	100%	129,970	100%	94,825	100%

2.4 Exports in Detail

Asia was the main destination for regional containers handled by PNW ports in 2014, as shown in Table 6, representing 87% of the cargo.

Table 6 Destination of Exports by Port of Departure within Study Region - 2014⁶

Port of Departure	Total	Asia	Europe	Central and South America	Australia/Oceania
NWSA	95,235	87,440	2,440	2,420	2,935
Portland	30,680	23,135	4,205	3,095	245
Oakland	3,105	2,310	210	325	260
All Others	190	115	0	0	75
Total	129,205	113,000	6,855	5,840	3,510
Percent of Total	100%	87%	5%	5%	3%

The top export commodities in the study region in 2014 were hay, vegetables, and wood products, as shown in Table 7.

⁶ Excludes "other" regions which accounted for 957 containers

Table 7 Top Export Commodities in Study Region - 2014

Commodity (Harm Code 4)	Containers	Percent Total Containers
Cereal Straw and Husks	31,960	25%
Wood Sawn or Chipped Length, Sliced, etc.	11,880	9%
Vegetables Nesoi Prepared or Preserve Nesoi, Frozen ⁷	9,545	7%
Kraft Paper and Paperboard, Uncoated Nesoi, Rolls	5,305	4%
Apples, Pears, and Quinces, Fresh	4,630	4%
Seeds, Fruit, and Spores, For Sowing	3,815	3%
Wood in the Rough, Stripped or not of Sapwood, etc.	3,640	3%
All Others	59,440	46%
Total	130,170	100%

2.5 Imports in Detail

Asia was the main source of imports destined for the study region and handled by PNW ports in 2014, as shown in Table 8.

Table 8 Import Containers 2014⁸

Port of Entry	Total	Asia	Europe	Central and South America	Australia/Oceania
NWSA	48,108	44,450	933	1,468	1,257
Portland	43,300	37,483	2,231	3,584	2
Oakland	2,798	1,821	501	275	201
All Others	555	551	0	4	0
Total	94,765	84,305	3,665	5,331	1,464
Percent of Total	100%	89%	4%	6%	2%

⁷ NESOI" stands for "Not Elsewhere Specified or Indicated

⁸ Excludes other regions which accounted for 613 containers

Table 9 shows the top import commodities in the study region in 2014. The top imports were tires and auto parts, furniture, plastics, apparel, and footwear.

Table 9 Top Import Commodities in Study Region - 2014

Commodity (Harm Code 4)	Containers	% Total Containers
New Pneumatic Tires, of Rubber	7,265	8%
Furniture Nesoi and Parts Thereof	6,603	7%
Parts of Balloons, etc., Aircraft, Spacecraft, etc.	2,969	3%
Seats (Except Barber, Dental, etc.), and Parts	2,553	3%
Glass Containers for Packing, etc. and Glass Closures	2,502	3%
Plywood, Veneered Panels and Similar Laminated Wood	2,342	3%
Articles of Plastics (Inc. Polymers and Resins) Nesoi	2,309	2%
Articles and Equipment for General Fitness and Recreational Activities	2,277	2%
Parts and Access for Motor Vehicles	2,021	2%
Footwear, Gaiters, etc. and Parts Thereof	1,932	2%
All Others (incl. consumer goods, electronics)	62,603	66%
Total	95,375	100%

2.6 Alliances and Container Carriers

The formation of alliances by liner shipping companies is a form of asset rationalization. Multiple liner companies are putting freight on each ship in the alliance. Multiple companies are contributing ships to alliance vessel strings and the terminal assets of the member companies are also utilized by multiple liner companies. This is necessary to fill large vessels and better control costs. Large vessels result in lower costs per container when they are well utilized, and this allows the members of the alliance to be more competitive than they could be on an individual carrier basis when operating smaller vessels.

In 2017, the four major alliances reshuffled their members and became three alliances, as follows:

- THE Alliance:
 - NYK Line
 - MOL
 - "K" Line
 - Hapag Lloyd
 - Yang Ming Marine Transport (Yang Ming)
- 2M Alliance:
 - Mediterranean Shipping Company (MSC)
 - Maersk Line
- Ocean Alliance:
 - COSCO Shipping
 - OOCL
 - Evergreen Marine Corporation
 - CMA CGM

Carriers have had numerous bankruptcies and consolidations since 2016. The latest developments in the alliance structure can be summarized as follows:

- Hanjin Shipping went bankrupt.
- Hapag-Lloyd acquired United Arab Shipping Company.
- CMA CGM acquired American President Lines.
- China Ocean Shipping (Group) Company merged with China Shipping Group to form COSCO Shipping.
- Maersk Line acquired Hamburg Sud.
- NYK Line, "K" Line and Mitsui O.S.K Line (MOL) announced their intent to form the Ocean Express Network (ONE) in 2018, effectively becoming one line.

- COSCO Shipping has announced its intent to acquire Orient Overseas Container Line (OOCL).
- COSCO Shipping is also rumored to be interested in acquiring CMA CGM.
- COSCO Shipping, Maersk Line, and CMA CGM have all made numerous other acquisitions in the past and continue to become the behemoths of the industry along with Mediterranean Shipping Company.

In addition to the alliance groups, there are several independent carriers in the transpacific trade. They are: Wan Hai Line, Pacific International Lines (PIL), SM Line, ZIM Integrated Shipping (ZIM), Hyundai Merchant Marine (HMM), Westwood Shipping Lines (Westwood), and Matson (eastbound only). Of the independent carriers, only HMM and Westwood currently serve PNW ports.

Meanwhile, carriers continue to suffer from rate volatility and low margins. In response to the economics, they have rationalized port calls and terminal operations. **Note that Terminal 5 in Seattle and the West Sitcum (APMT) in Tacoma are currently empty.**⁹ Carriers are operating ever larger ships and ports must provide the required channel depth, berth length and crane supply and outreach. Consequently, surge capacity at terminals is being stretched.

In 2016, there were 46 transpacific services; in 2017, there were 39. More specifically, as it pertains to Portland, there were 18 PNW services in 2016 and only 12 in 2017. The 12 services to the PNW include:

- 2M Alliance – 2
- Ocean Alliance – 4
- THE Alliance – 3
- ZIM – 1
- HMM – 1
- Westwood – 1

As of today, eight of these services employ vessels of a size that could physically call Portland. However, the carriers (representing 9 of the 12 services to the PNW) who are members of an alliance would need to agree to such a call as the alliances' governing boards control the routings and terminal selections for the carriers. It is important to remember that alliances exist to maximize profit and control costs, not to improve service. The result is that the Beneficial Cargo Owners (BCOs) have fewer choices of carriers, fewer choices of routes, and less visibility of the physical movement of the cargo (i.e., which ship cargo goes on or which terminal cargo will come through). It is more likely that Portland would be attractive to one of the independent lines operating smaller vessels.

⁹ The APMT Terminal has been recently taken over by SSA and the terminal, at this point in time, will only service the Matson Alaska trade lane.

The alliances have combined 87% share of transpacific volume, as shown in Table 10. The three main alliances had 71% share of the Portland market in 2014. These three alliances own 93% of global slot capacity as of August 2017.

Table 10 Share of Regional and Transpacific Market by Container Carrier

Alliance	Carrier	% of Portland Market (2014)	% of Transpacific Container Market (2017)	Global Slot Capacity (Million TEU) - Owned ¹⁰	Global Slot Capacity (Million TEU) - Orderbook
THE	Hapag-Lloyd	5%		1.50	0.05
THE	NYK + MOL + KL	14%		1.45	0.30
THE	Yang Ming	7%		0.60	0.05
THE Alliance Subtotal		26%	27%	3.55 (20%)	0.40
Ocean	COSCO SHG + OOCL	8%		2.40	0.60
Ocean	CMA CGM	11%		2.35	0.10
Ocean	Evergreen	10%		1.00	0.30
Ocean Alliance Subtotal		29%	40%	5.75 (33%)	1.00
2M	APM Maersk + Hamburg Sud	13%		4.00	0.40
2M	MSC	3%		3.10	0.20
2M Alliance Subtotal		16%	20%	7.10 (40%)	0.60
	Hanjin	18%		-	-
	Pacific Int'l Line	0%		0.30	0.10
	ZIM	0%		0.30	0.00
	HMM	11%		0.30	0.00
	Wan Hai	0%		0.30	0.00
Non-Alliance Subtotal		29%	13%	1.20 (7%)	0.10
Total		100%	100%	17.60	2.10

¹⁰ Source: Alphaliner, Flexport (Note that the above table does not reflect the 18% carried by Hanjin in 2014).

A review of the regional market shows that the only two carriers to call at Terminal 6 (Hapag-Lloyd and Hanjin) had 23% share of the regional market in 2014. This means that nearly three-quarters of the market was served by carriers that did not call Portland in 2014.

Based on Advisian’s review, alliance decisions dictate carrier decisions. Table 11 shows how carrier decisions are prioritized.

Table 11 Carrier Decisions by Priority

Prioritization	Factor	Reasoning
1	Alliance Decisions	Carriers consider the preferences of other carriers within their alliance subject to impacts on profitability.
2	Vessels	Carriers contributing vessels to a string have more sway as to which ports and terminals are called.
3	Terminal ownership	Carriers within the alliance that have an ownership interest in a terminal at the Port have some say in what terminals are called on a given string.
4	Terminal productivity	Efficient, productive, and consistent terminal operations are a must for deployment integrity.
5	Terminal infrastructure	Terminal size, landside connectivity, berth size, the number and size of cranes and water depth are considered

2.7 Vessels

The longer-term issue is that transpacific carriers are in the process of upsizing their fleet to 10,000 twenty-foot equivalent units (TEUs) and larger vessels (Table 12). As the big ships are deployed in the Asia-Europe trade, larger vessels are cascaded into the transpacific. Due to the depth constraint of the Columbia River navigation channel, the largest container ships that can call Portland are 5,000 to 7,000 TEUs in size. As larger vessels are cascaded in the transpacific vessel strings, the number of ships of a size that could or would call Portland will diminish.

Table 12 Current Orderbook for Transpacific Carriers

Alliance		2017			2018			2019			Totals		
		# Vessels	Avg TEUs	Total TEUs	# Vessels	Avg TEUs	Total TEUs	# Vessels	Avg TEUs	Total TEUs	Vessels	Avg TEU	TEUs
The Alliance	NYK	1	14,100	14,026	1	14,100	14,026	1	14,000	14,000	3	14,100	42,052
	MOL	3	20,200	60,510	1	20,200	20,170				4	20,200	80,680
	K Line				5	13,900	69,350				5	13,900	69,350
	Hapag Lloyd	2	15,000	29,986							2	15,000	29,986
	Yang Ming	3	14,000	42,000	7	14,000	98,000				10	14,000	140,000
The Alliance Total		9	16,300	146,522	14	14,400	201,546	1	14,000	14,000	24	15,100	362,068
		16%		20%	15%		18%	13%		11%	15%		18%
2M Alliance	MSC	12	11,500	138,000	3	11,500	34,500				15	11,500	172,500
	Maersk	18	14,100	252,558	8	11,000	87,210				26	13,100	339,768
2M Alliance Total		30	13,100	390,558	11	11,100	121,710				41	12,500	512,268
		53%		52%	12%		11%	0%		0%	26%		26%
Ocean Alliance	COSCO	3	12,700	38,100	28	17,800	497,500				31	17,300	535,600
	OOCL	2	21,200	42,226	1	21,200	21,113				3	21,200	63,339
	Evergreen	2	14,000	28,000	26	6,400	164,000	5	18,000	90,000	33	8,600	282,000
	CMA CGM	9	9,000	80,300	5	5,600	27,600				14	7,800	107,900
	Ocean Alliance Total		16	11,800	188,626	60	11,900	710,213	5	18,000	90,000	81	12,300
		28%		25%	65%		63%	63%		71%	51%		49%
Non-Alliance	PIL	2	11,800	23,600	8	11,800	94,400	2	11,800	23,600	12	11,800	141,600
Non-Alliance Total		2	11,800	23,600	8	11,800	94,400	2	11,800	23,600	12	11,800	141,600
Totals		57	13,146	749,306	93	49,200	1,127,869	8	15,950	127,600	158	12,688	2,004,775

Alliance		2017			2018			2019			Totals		
		# Vessels	Avg TEUs	Total TEUs	# Vessels	Avg TEUs	Total TEUs	# Vessels	Avg TEUs	Total TEUs	Vessels	Avg TEU	TEUs
The Alliance Total		9	16,300	146,522	14	14,400	201,546	1	14,000	14,000	24	15,100	362,068
		16%		20%	15%		18%	13%		11%	15%		18%
2M Alliance Total		30	13,100	390,558	11	11,100	121,710				41	12,500	512,268
		53%		52%	12%		11%	0%		0%	26%		26%
Ocean Alliance Total		16	11,800	188,626	60	11,900	710,213	5	18,000	90,000	81	12,300	988,839
		28%		25%	65%		63%	63%		71%	51%		49%
Non-Alliance Total		2	11,800	23,600	8	11,800	94,400	2	11,800	23,600	12	11,800	141,600
Totals		57	13,146	749,306	93	49,200	1,127,869	8	15,950	127,600	158	12,688	2,004,775

The quest for lower cost structures has resulted in the acquisition of newer, larger vessels that require carrier rationalization and cooperation to maximize vessel utilization. That trend is continuing at a rapid pace. The vessel order books of the carriers include 158 new builds from 2017 to 2019. Although some of these vessels are small (<2,500 TEU), nearly 85% of current orders are for vessels above 10,000 TEU. Almost no ships of the 5,000 -7,000 TEU size are being built. It is likely that none of the 2,500 TEU vessels will be deployed in the transpacific trade lanes and instead will be used for intra-Asia or intra-Europe trade lanes.

The trend toward larger ships in the transpacific will continue and there will be limited opportunities for Portland to attract a transpacific service due to vessel size limitations. Alliances control almost 90% of the transpacific freight. This is not a favorable condition for a smaller port like Portland.

Of the eight lines that operate ships that still can call Portland, it would appear that six will be cascading larger ships into the transpacific trade lane. Certainly, within a couple of years, these lines will not be operating vessels that will be small enough sail up the Columbia River to make a Portland call. Westwood and HMM are the most likely candidates to operate smaller ships and make a Portland call.

In the case of HMM, it is questionable whether the line can remain viable as an independent carrier while operating smaller ships. It is also questionable if Matson can survive in the eastbound trade and if Wan Hai and PIL remain in the transpacific trade lane.

The bottom line is that the average vessel size in 2016 was 3,940 TEUs. Based on an analysis by Alphaliner, the average size in 2019 will be 4,340 TEUs which includes the new builds and scrapping of the older vessels.

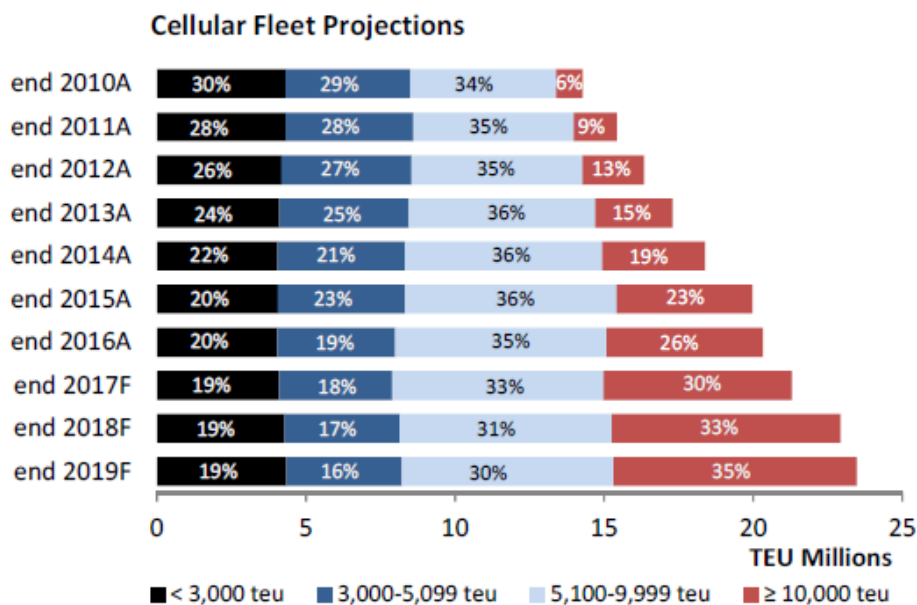
Alphaliner estimates that a net increase of 129 vessels with less than a 5,100-TEU capacity will come on line between now and 2019 representing 223,260 TEUs. Alphaliner further states that none of these vessels will be deployed into the transpacific trade lanes.

As of October 2017, the transpacific trade lanes consisted of 446 vessels. The resulting TEU capacity in Table 13 shows the vessels less than 5,100 TEUs to be increasing in typical vessel size from 4,412 TEUs to 4,688 TEUs.¹¹ This results in a net drop (new builds less scrapped or going off-charter) in the number of vessels in the trade lane. Furthermore, the data shows a net increase of 50 vessels greater than 5,100 TEUs, increasing the overall vessel size average from 7,700 TEUs to 8,200 TEUs as shown in Figure 5.

Table 13 Change in Vessel Size for Transpacific Trade Lanes¹²

Vessel Size (TEU)	2017			2019		
	Total TEU Capacity	Total Vessels	Avg TEU/Vessel	Net TEU Capacity	Net Vessels	Avg TEU/Vessel
2,000-5,100	375,031	85	4,412	375,031	80	4,688
5,100- >18,000	3,061,043	361	8,479	3,694,791	416	8,877
Total Fleet	3,436,074	446	7,704	4,069,822	496	8,202

Figure 5 Container Fleet Projections¹³



¹¹ Less than 5,100 TEU capacity is considered to be the approximate maximum size vessel that could call Portland unless loaded light.

¹² Alphaliner Monthly Monitor October 2017

¹³ Alphaliner Monthly Monitor October 2017

2.8 Ocean Shipping Cost Analysis

Advisian reviewed the **bunker fuel and charter costs** for Far East to PNW container shipping services operated by alliance carriers. The analysis focused on three current services for review: THE Alliance service, 2M Alliance service, and Ocean Alliance service. The analysis did not include port costs.¹⁴

Adding Portland while maintaining the duration of a single vessel’s rotation would require:

- Dropping an existing port of call from the service; or
- Reducing the time in port by a cumulative amount of one day (while adding another call at Portland); or
- Increasing the average operating speed of the vessel by 0.8 knots up to 2.4 knots. This would represent 82% up to 90% of the maximum operating speed of the vessels in fleet.

Since none of the above are feasible options for these services, the more likely recourse would be to increase the duration of the rotation for each vessel by seven days.

Thus, the shipping lines would have to add a vessel to each service, thereby increasing the annual cost of the service as shown on the following slides.

2.8.1 THE Alliance Service

For a selected THE Alliance service in the PNW, Advisian’s analysis found that adding a stop at Portland increases the annual cost of service by over \$8 million as shown in Table 14 and Table 15. Ports called on this service include: Singapore, Laem Chabang, Cai Mep, Kaohsiung, Yantian, Tacoma, Vancouver (BC), Tokyo, Kobe, Kaohsiung, Singapore.

Table 14 Comparison of THE Alliance Service with and without Portland

Ocean Shipping Cost*	As Is	With Portland	Difference
Single Vessel Voyage (Average)	\$2,632,944	\$2,789,327	\$156,383
Annual Service (All Vessels)	\$136,913,083	\$145,044,982	\$8,131,898

**Includes time charter and bunker fuel costs; does not include port charges*

Table 15 Detailed Breakdown of Operating Costs for THE Alliance Service

Service	Deployment	With Portland	Difference
Frequency of Service (Days)	7	7	

¹⁴ Fuel costs were calculated as a function of average vessel horsepower and not speed. Charter rates based on latest market information.

Service	Deployment	With Portland	Difference
Vessels in Rotation	7	8	1.0
Nominal Vessel Capacity (TEUs) – Avg/Fleet	6,400	6,400	
Load Factor – Avg of Fleet	60%	60%	
Horsepower - Avg of Fleet	59,066	59,066	
Estimated Time Charter Rate (\$/Day)	\$12,720	\$12,720	
Distance (Nautical Miles)	16,100.0	16,532.0	432
Operating Speed (Knots) - Avg of Fleet	19.4	19.4	
Total Number of Port Visits	11	12	1.0
Steam Time (Days)	35.3	36.3	1.0
Time in Port (Days)	13.7	19.7	6.0
Total Time Voyage (Days)	49.0	56.0	7.0
Est. Fuel Consumption (Metric Tons/Day)	180.74	180.74	
Bunker Fuel Price (USD/Metric Ton) - Global 20 Ports Average	\$311.00	\$311.00	
Bunker Use in Port (% of Steam Usage)	3.30%	3.30%	
Bunker Fuel Cost	\$2,009,647	\$2,076,988	\$67,340
Charter Cost	\$623,296	\$712,339	\$89,042
Voyage Cost	\$2,632,944	\$2,789,327	\$156,383
Average Cost per TEU per Voyage	\$411	\$436	\$24
Annual Total Cost of Service	\$136,913,083	\$145,044,982	\$8,131,898

2.8.2 The 2M Alliance

For a selected 2M Alliance service in the PNW, Advisian’s analysis found that adding a stop at Portland increases the annual cost of service by over \$13 million as shown in Table 16 and Table 17.

Ports called on this service include: Hong Kong, Yantian, Kaohsiung, Shanghai, Busan, Tacoma, Vancouver (BC), Busan, Kwangyang, Kaohsiung, and Hong Kong.

Table 16 Comparison of 2M Alliance Service with and without Portland

Ocean Shipping Cost*	As Is	With Portland	Difference
Single Vessel Voyage (Average)	\$1,573,779	\$1,699,287	\$125,509
Annual Service (All Vessels)	\$81,836,482	\$95,160,075	\$13,323,593

*Includes time charter and bunker fuel costs; does not include port charges.

Table 17 Detailed Breakdown of Operating Costs for 2M Alliance Service

Service	Deployment	With Portland	Difference
Frequency of Service (Days)	7	7	
Vessels in Rotation	6	7	1.0
Nominal Vessel Capacity (TEUs) – Avg/Fleet	5,175	5,175	
Load Factor – Avg of Fleet	60%	60%	
Horsepower - Avg of Fleet	46,939	46,939	
Estimated Time Charter Rate (\$/Day)	\$10,285	\$10,285	
Distance (Nautical Miles)	12,115.0	12,547.0	432
Operating Speed (Knots) - Avg of Fleet	20.2	20.2	
Total Number of Port Visits	11	12.0	1.0
Steam Time (Days)	25.0	26.0	1.0
Time in Port (Days)	17.0	23.0	6.0
Total Time Voyage (Days)	42.0	49.0	7.0
Fuel Consumption (Metric Tons/Day)	143.63	143.6	
Bunker Fuel Price (USD/Metric Ton) - Global 20 Ports Average	\$311.00	\$311.00	

Service	Deployment	With Portland	Difference
Bunker Use in Port (% of Steam Usage)	3.30%	3.30%	
Bunker Fuel Cost	\$1,141,817	\$1,195,332	\$53,515
Charter Cost	\$431,961	\$503,955	\$71,994
Voyage Cost	\$1,573,779	\$1,699,287	\$125,509
Average Cost per TEU per Voyage	\$304	\$328	\$24
Annual Total Cost of Service	\$81,836,482	\$95,160,075	\$13,323,593

2.8.3 The Ocean Alliance

For a selected Ocean Alliance service in the PNW, Advisian's analysis found that adding a stop at Portland increases the annual cost of service by over \$7 million as shown in Table 18 and Table 19.

Port rotation on this service is: Shekou, Hong Kong, Yantian, Kaohsiung, Vancouver (BC), Seattle, Busan, Kaohsiung, and Shekou.

Table 18 Comparison of Ocean Alliance Service with and without Portland

Ocean Shipping Cost*	As Is	With Portland	Difference
Single Vessel Voyage (Average)	\$1,828,171	\$1,968,116	\$139,945
Annual Service (All Vessels)	\$95,064,909	\$102,342,045	\$7,277,133

*Time charter rate and bunker fuel; does not include port charges.

Table 19 Detailed Breakdown of Operating Costs for 2M Alliance Service

Service	PNW4 (As Is)	With Portland	Difference
Frequency of Service (Days)	7	7	
Vessels in Rotation	6	7	1.0
Nominal Vessel Capacity (TEUs) – Avg/Fleet	5,866	5,866	
Load Factor – Avg of Fleet	60%	60%	
Horsepower - Avg of Fleet	55,656	55,656	

Service	PNW4 (As Is)	With Portland	Difference
Estimated Time Charter Rate (\$/Day)	\$11,659	\$11,659	
Distance (Nautical Miles)	11,867.0	12,307.0	440
Operating Speed (Knots) – Avg	20.0	20.0	
Total Number of Port Visits	9	10.0	1.0
Steam Time (Days)	24.7	25.6	0.9
Time in Port (Days)	17.3	23.4	6.1
Total Time Voyage (Days)	42.0	49.0	7.0
Fuel Consumption (Metric Tons/Day)	170.31	170.3	
Bunker Fuel Price (USD/Metric Ton) - Global 20 Ports Average	\$311.00	\$311.00	
Bunker Use in Port (% of Steam Usage)	3.30%	3.30%	
Bunker Fuel Cost	\$1,338,488	\$1,396,819	\$58,331
Charter Cost	\$489,683	\$571,297	\$81,614
Voyage Cost	\$1,828,171	\$1,968,116	\$139,945
Average Cost per TEU per Voyage	\$312	\$335	\$24
Annual Total Cost of Service	\$95,064,909	\$102,342,042	\$7,277,133

2.9 Competitor Analysis and Case Studies for Tasks 1 and 2

Advisian prepared an analysis on competing terminals for Terminal 6 based on Advisian’s expertise as well as the regional and local knowledge of port experts in the PNW. The analysis is summarized in Table 20.

Based on this review, Advisian believes that Fairview, Terminal 18, and Husky/General Central Peninsula Terminal (GCP) are the likely long-term winners in the PNW with Terminal 5 and Roberts Bank Terminal 2 as potential game changers if and when these terminal improvements are completed.

Table 20 Review and Comparison of Pacific Northwest Terminals

Advisian Projection	Terminal	Advisian Comments	Comments in 2016 Port of Portland Study
Winner	Fairview Terminal	On second phase of three to increase their capacity. Will be at 1.35M TEUs this year. 100% intermodal but only CN offers service.	Winner. New alliances will bring new carriers, phase II expansion likely to add vessel calls.
Winner	Terminal 18	This will likely be the only terminal that will survive at Seattle due to urban encroachment and the NWSA structure will promote other marine terminals in Tacoma.	Neutral. Due to sheer size, Terminal 18 will maintain operational levels. SSA has well established relationships with several carrier operations on the USWC.
Winner	Husky/GCP	With the new wharf alignment and the potential to incorporate entire peninsula, the GCP terminal will be a major player.	Winner. Same scenario as Terminal 46, but with expansion potential if Olympic Container Terminal acreage becomes available.
Game Changer	Terminal 5	As of right now, not enough money, carrier commitment and intense pressure to use the terminal for other than maritime use indicates terminal development is several years away. However, should Terminal 5 come back online it could be a significant competitive terminal.	Loser. Unsure if this will ever come back. There's no secure funding, or funding vision in place to get this facility back online.
Game Changer	Roberts Bank Terminal 2	Would provide an additional 2.4M TEUs by mid 2020s for the Port of Vancouver (BC). Has survived several political and environmental hurdles, but has several yet to overcome before it becomes reality.	
Neutral	Deltaport	Terminal expansion is struggling with social and environmental issues. Limited growth potential in Deltaport 1 (max of 2.4M TEUs), already close to capacity.	Winner. Large terminal likely to be Western Canada gateway for 2M Alliance.

Advisian Projection	Terminal	Advisian Comments	Comments in 2016 Port of Portland Study
Neutral	Washington United Terminal (WUT)	Neutral. Hyundai is only getting benefit of buying some slots from Maersk and MSC which call Seattle. Not much upside here.	Winner. Much upside to joining with the 2M Alliance that goes beyond existing vessel calls if 2M Alliance decides to push to grow market share and add new services, WUT and Deltaport seem like the obvious candidates to handle the vessels.
Loser	Terminal 46	Hanjin has gone out of business. T46 may ultimately be repurposed. It is in the middle of the city, congested area, location is problematic. This is especially likely if Terminal 5 were to be redeveloped.	Winner. Eight carriers in THE Alliance opens Hanjin's TTI terminal with opportunities for new calls along with closure of Terminal 5 which reduces options for carrier choices.
Loser	Pierce County Terminal	Ability for carriers with larger vessels to use this terminal is limited. The channel width is not sufficient. Requires tugs on both ends (doubling the cost). May end up being used for smaller ships only.	Winner. New Ocean Alliance will provide much growth potential for this large and underutilized facility which is also the newest container terminal in the U.S. PNW.
Loser	Centerm	Urban encroachment, congestion, small footprint, and lack of direct intermodal yard has limited the capacity of the terminal. With the opening of Roberts Bank Terminal 2 and the increased throughput at Deltaport, the future for this terminal is not positive.	Neutral. Maintain volumes, high demand, but unable to expand.
Loser	Vanterm	Urban encroachment, congestion, small footprint, and lack of direct intermodal yard has limited the capacity of the terminal. With the opening of Roberts Bank Terminal 2 and the increased throughput at Deltaport, the future for this terminal is not positive.	Neutral. Maintain volumes, high demand, but unable to expand.
Loser	Fraser Surry	This terminal does not handle any international containers. CSPAN brings containers over on barge from Vancouver Island. This terminal should not be considered as a regional container terminal competitor.	Loser. Container calls are only one piece of their business. Logistically, makes more sense to consolidate operations with other alliance members.

Advisian Projection	Terminal	Advisian Comments	Comments in 2016 Port of Portland Study
Loser	Terminal 30	This terminal is not really a viable terminal. Currently it is being used for empty container storage as Matson has shifted to Terminal 18.	Loser. As a small facility with only one call, it does not make sense that this would continue or grow with the new alliances.
Loser	Olympic Container Terminal	Will be incorporated into GCP terminal.	Loser. A small facility with one berth at the end of its lease term. Survival of this terminal in its present state is questionable.

Table 21 summarizes the Port of Portland’s advantages and disadvantages relative to competitors.

Table 21 Portland’s Advantages and Disadvantages Relative to Competitors

Portland’s Advantages	Portland’s Disadvantages
Loyal importers using Portland and a growing number of mid-sized importers	Smaller local population means lower local consumption levels of imported goods
A strong and vibrant export cargo market	Added cost of being a container port that is 100 miles up a river and requiring dual pilotage
Carriers who call directly enjoy limited competition	Inability to accommodate the larger container vessels that are increasingly being used (see table below)
With a lack of direct service options compared to other ports, the sellers pricing power is much greater	Lack of direct service options compared to other ports, increasing the sellers pricing power
Existence of direct rail service to hinterland markets	History of poor relations between labor and industry

Table 22 shows the depth restrictions for major West Coast container ports. The analysis shows that Portland faces more restrictions in this area than any of its competitors.

Table 22 Depth Restrictions for West Coast Container Ports

Port	Draft Depth (Ft)
Port of Seattle	50
Port of Tacoma	>50
Port of Portland	43
Port of Oakland	50
Port of San Francisco	50
Port of Los Angeles	>52
Long Beach	>50

2.10 Case Studies

This section presents case studies of three niche ports that have similarities to the Port of Portland in terms of having historically served containers but expanding to handle other cargo.

2.10.1 Port of Hueneme, Oxnard CA

The Port of Hueneme in Southern California benefits from global partnerships, a large local population, and specialized cargo handling. Table 23 summarizes the success factors found at Port Hueneme with the following key points or takeaways:

- The Port of Hueneme has built its container business on fresh/frozen food products which were originally shipped in a palletized state.
- South/Central America is the primary trade route.
- The Port of Hueneme serves a large population area (Southern and Central California).

Photo 1 Port of Hueneme (Source: Port of Hueneme)



Table 23 Port of Hueneme

Description	Port Hueneme is located 60 miles northwest of Los Angeles on U.S. 101 and the Union Pacific Railroad mainline and serves the Southern California market and lower Central Valley, including its large agricultural and consumer population bases.
Assets	Three wharfs for commercial cargo. Three wharfs licensed from the Navy. Squid Fishery. 4 Floats for Small Craft. Eight-acre switchyard that holds 99 box cars or 80 auto racks. 256,000 Square Feet On-dock Cold Storage. 60,000 Square Feet Off-dock Cold Storage (Private). Mobile harbor cranes available
Market Size	Port Hueneme: pop 21,723 (2015). Located 60 miles from Los Angeles MSA, with pop. 18.7M (2015).
Commodities Handled	The port focuses on cargo that needs to be moved quickly, such as fresh produce and automobiles. Bananas account for about 30 percent of the port’s cargo; cars make up 60 percent. The Port handles a limited amount of project cargo as well.
Success Factors	Partnership with one of world’s largest banana exporters (Ecuador). Three auto processors are located less than two miles from the port. The five deep-water berths are equipped with shore-side power capacity for vessels to plug in. Large population located within 100 miles.

Source: Port of Hueneme, Various News Articles.

2.10.2 Philadelphia

The Port of Philadelphia benefits from a large local market, public-private partnerships, and federal funding. Table 24 summarizes the success factors found at the Port of Philadelphia based on the following key takeaways:

- The historic logistics business and infrastructure supporting the Chilean and South American fruit trade is well established and is not prone to change.
- South/Central America is the primary trade route, but it also has some Europe/ANZAC services.
- The Port of Philadelphia serves a large population area (the U.S. Northeast market).
- Deepening of the Delaware channel from 40 feet to 45 feet is underway at a cost of \$392 million and will be completed by 2018.
- Container volumes have been slightly increasing over the past few decades.

Photo 2 Port of Philadelphia (Source: Port of Philadelphia)



Table 24 Port of Philadelphia

Description	PAMT, leased to Astro Holdings Inc. ("Astro"), spans 112 acres and has 3,800 linear ft. of berthing space, including six berths with one being a Roll-On/Roll-Off (RO/RO) berth. The Packer Avenue Marine Terminal handled 407,100 TEUs and a total of 374 container vessels in 2015.
Assets	Two Post-Panamax container cranes and three Panamax container cranes. Six Toploaders: 95,000 lbs., 5 Toploaders: 30,000 lbs., 100 Forklifts: 3,000 lbs. to 35,000 lbs., 20 Yard hustlers,
Market Size	Philadelphia MSA pop: 6M (2016). State pop: 12.8M (2016). Located within a one-day drive of 200 million people.
Commodities Handled	Containers, steel products, frozen meat, fruit, heavy lift, project, paper.
Success Factors	Huge market within one day driving distance. Strong relations and partnerships with private sector. New equipment including two new electric ship-to-shore gantry cranes. Receives and manages significant federal funding (e.g., Delaware River Main Channel Deepening project).

Source: Port of Philadelphia, Various News Articles.

2.10.3 Port of San Diego

The Port of San Diego benefits from operational excellence in breakbulk handling and proximity to Mexico and Los Angeles, CA. Table 25 summarizes the success factors found at the Port of San Diego as follows:

- The Port built its container business on fresh/frozen food products that were originally transported in a palletized state.
- South/Central America is the primary trade route.
- The Port of San Diego serves a large population area (Southern California and North Mexico).

Photo 3 Port of San Diego (Source: Port of San Diego)



Table 25 Port of San Diego

Description	The Port oversees two maritime cargo terminals, two cruise ship terminals, 20 public parks, and 600 tenant businesses. Tenth Avenue Marine Terminal is a 96-acre complex with eight berths and depth of 42'. National City Marine Terminal is a 135-acre complex with four working berths and depth of 35'. Operated by Pasha.
Assets	10th Ave Marine Terminal: Mobile harbor crane. Cold storage, covered storage and open laydown space. 300,000 sq. ft. warehouse. On-dock shore power and fueling. National City Marine Terminal: Secure facilities for valuable cargo with 24-hour monitoring
Market Size	San Diego MSA: 3.3M (2015). Located 100 miles from Los Angeles MSA pop. 18.7M (2015). Also located 20 miles from Mexican border.
Commodities Handled	Importer of perishables and refrigerated commodities, fertilizer, cement, breakbulk commodities. Vehicle import/export facility handling 10% of autos entering U.S.
Success Factors	The Port has a diverse mix of maritime and real estate assets in prime tourism/business areas of the city. Its specialization in niche breakbulk commodities has allowed it to achieve operational excellence.

Source: Port of San Diego, Various News Articles.

2.11 Conclusions for Tasks 1 and 2

The bottom line is that there is sufficient cargo in the Portland region to be of interest to a container line to serve Terminal 6, but the Port's ability to capture that cargo depends upon a number of factors – many of which are outside its control.

The cost to a container carrier for calling at Portland is significant in absolute terms but could be offset by offering a niche service.

Portland faces strong competition from PNW terminals that have advantages in terms of size, efficiency, water depth, intermodal, etc.

Several niche ports around the U.S. have built a good business through specialization, partnerships, and government support. However, those niche markets were built around niche beneficial cargo owners which do not exist in the Portland study region to any great extent.

3. Task 3 - SWOT Analysis

3.1 Introduction for the SWOT Analysis

Input from the Industry Leader Committee (ILC), Port staff, and the observations of the members of the consultant group has formed the basis of the Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis. Advisian developed a process in which stakeholders, Port staff, and the consultants put aside their individual desires, preferences, and prejudices and addressed all components of the SWOT objectively. The goal was not to prejudge or influence the outcome but to make sure the inputs resulted in an output which is a realistic assessment that the Port can use in its decision-making process.

Based on all the foregoing analysis, the team developed a SWOT assessment for Terminal 6 as it pertains to the container market. The purpose of this analysis was to identify opportunities that could be further analyzed in subsequent tasks and provide a framework by which the Port can build on the strengths, address the weaknesses, take advantage of the opportunities, and head off the threats.

3.2 Summary SWOT

Summary of SWOT Categories Based Upon Staff, ILC and Consultant Observations

Strengths	Weaknesses
<ul style="list-style-type: none">▪ Good transportation access (especially rail and barge)▪ Infrastructure in place/Turnkey terminal is ready to go▪ Lack of local competition/Sole container facility in OR/Location is centrally located for exporters▪ Location/Strong shipper support has competitive advantage for OR, ID, SW WA and Eastern WA shippers/Land availability within region and at Port offer opportunity for development	<ul style="list-style-type: none">▪ Geographical challenges<ul style="list-style-type: none">– Extra steaming time up river, fuel, pilotage, draft, size of ships limited to less than 6,800 TEUs▪ Global perception of labor as undependable, not always available to work ship, cranes or trains/Potential shortage of labor▪ Past financial model unsustainable (heavy Port allocations, terminal not right sized for volume)/Too big for small opportunities/Too small for big opportunities/Demonstrated history of operating loss▪ Market size▪ Political roadblocks to infrastructure due to environmental community/protections

Opportunities	Threats
<ul style="list-style-type: none"> ▪ Strong state-wide public interest for a container terminal at Terminal 6 ▪ Good for niche services with smaller vessels ▪ Good transportation options including Inland Barge Service and On-dock Intermodal Yard ▪ Available terminal/Potential for innovation ▪ Continued demand for service ▪ Regional economic growth strong/Outlook good 	<ul style="list-style-type: none"> ▪ Labor unpredictable/Labor (5) ▪ Timeframe to reintroduce containers at Terminal 6 is short (12-18 months) ▪ Cost to ramp up to a profitable terminal ▪ Consolidations of carrier services (development of new alliances with larger ships) ▪ Cargo owners have moved on – developed new supply chains without Portland (primarily imports, both import and export in some cases) ▪ Competition from other PNW ports

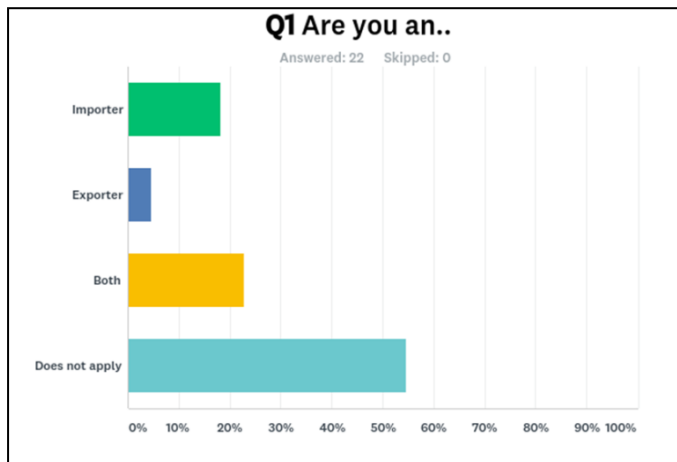
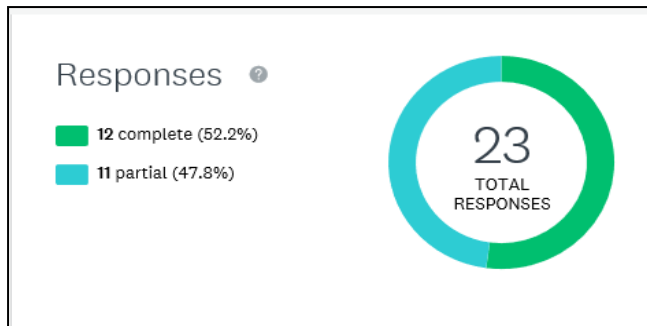
3.3 Steps Taken to Develop the SWOT Analysis

The SWOT analysis was done by conducting two separate seminars and then reconciling the results of both. The first was done with members of the ILC. The second was done with key members of Port staff.

Step 1 - A Survey was developed to solicit input from the ILC members.

Advisian sent survey invitations to ILC members and alternatives on July 12, 2017:

- 27 - Invitations went out.
- 23 - Opened the invitations to the survey.
- 12 - Surveys were completed.



The results of the survey were shared and discussed with the ILC at their August 3, 2017 meeting. The numbers in parentheses indicate the number of responses compared to the total number of responses. These results are outlined below.

Strengths (Q8) - 12 Responses, 10 skipped

- Low cost transportation choice for Oregon low valued export commodities such as hay and lumber or price sensitive agricultural products
- Positioned closer to Oregon importers and exporters (2/12)
- Good location for shippers in Oregon, Idaho, SE Idaho, SW Washington (3/12)
- No Local competition/Good Location (1/12)
- Much cheaper than trucking to Tacoma (2/12)
- 400-acre multi-use facility with adjacent on-dock rail
- Infrastructure already in place/Empty facility (2/12)
- Rail infrastructure/Inland Point Intermodal (3/12)
- Good barge service to Boardman, OR; Pasco, WA; and Lewiston, ID (2/12)

- Demand for service already exists (2/12)
- Capacity and interest in finding new market (1/12)
- Small market advantages (1/12)
- Terminal used to offer 6 days free-time (demurrage) (1/12)
- Skilled and available work force (1/12)

Weaknesses (Q9) - 12 Responses, 10 skipped

- Shipping line alliances- fewer ports/larger ships (5/12)
- Location/Distance Upriver: two pilots, must burn clean fuel for longer (Emission Control Area) and river depth (5/12)
- Transit time/operating cost 4/12
- Labor Issues/Jurisdiction conflicts (4/12)
- If Terminal 6 reaches capacity, then there will be bottlenecks, i.e., roads (2/12)
- Insufficient volumes at Terminal 6 (2/12)
- Need incentives for ships to call (2/12)
- Aging equipment (1/12)

Opportunities (Q10) - 10 Responses, 12 skipped

- Good alternative to Seattle/Tacoma (6/10)
- Congestion at Seattle/Tacoma (3/10)
- Cost of moving products to and from Seattle/Tacoma (1/10)
- Trucking regulations in Seattle/Tacoma (1/10)
- The Port is willing to restart service in a creative way (1/10)
- Support at Governor's office and Port leader to find a solution (1/10)
- Make it an Inland Point Intermodal hub (2/10)
- Cranes that work (1/10)

- Available labor (1/10)
- Local agricultural companies can capitalize on speed to market (1/10)
- Promote transload facilities near Port (1/10)

Threats (Q10) 11 Responses 11 skipped

- Ships too larger for Terminal 6/River depth (4/11)
- Labor issues (3/11)
- Can't compete with larger ports (2/11)
- Faster more efficient port, i.e., in Mexico (1/11)
- Ecommerce/3D Printing - Moving away from ocean containers (1/11)
- Fewer ocean carriers in the marketplace (1/11)
- Carriers losing money (1/11)

Step 2 - Port staff participated in an on-site workshop to develop a Terminal 6 SWOT analysis based upon their knowledge.

A two-hour Port staff SWOT workshop was held on July 31, 2017 at the Port headquarters to provide staff input into the SWOT Analysis. Port staff was asked to identify themes for each of the SWOT categories. A summary of the top themes follows (Note: the staff was asked to summarize their list into the top four per category):

Summary of Port of Portland Staff SWOT Themes

Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ Good transportation access (especially rail and barge) ▪ Turnkey terminal is ready to go ▪ Sole container facility in OR centrally located for exporters ▪ Strong shipper support has competitive advantage for OR, ID, SW WA and Eastern WA shippers 	<ul style="list-style-type: none"> ▪ Geographical challenges ▪ Extra steaming time up river, fuel, pilotage, draft, size of ships limited to less than 6,800 TEUs ▪ Global perception of labor as undependable, not always available to work ship, cranes or trains ▪ Past financial model unsustainable (heavy Port allocations, terminal not right sized for volume)

Opportunities	Threats
<ul style="list-style-type: none"> ▪ Strong state-wide public interest for a container terminal at Terminal 6 ▪ Inland Barge Service ▪ On-dock Intermodal Yard <p>Good for Niche services such as <i>Smaller vessels serving</i>:</p> <ul style="list-style-type: none"> ▪ South America ▪ Australia ▪ Japan (out ports) 	<ul style="list-style-type: none"> ▪ Labor unpredictable ▪ Timeframe to reintroduce containers at Terminal 6 is short (12-18 months) ▪ Consolidations of carrier services (development of new Alliances with larger ships) ▪ Cargo owners have moved on – developed new supply chains without Portland (primarily imports, both import and export in some cases)

Step 3 - The ILC reviewed the survey results and participated in exercises to further inform the SWOT.

During the ILC meeting on August 3, 2017, the committee reviewed the findings of the survey and participated in exercises to fill out the SWOT. This allowed those committee members not participating in the written survey to participate. It also allowed the committee to refine their input. The following is a summary of the results of the ILC SWOT identification of themes.

Summary of ILC SWOT Themes

Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ Transportation access (8) ▪ Location – Oregon, Idaho and parts of Washington (8) ▪ Lack of local competition (5) ▪ Speed to market - cargo availability, readily available to rail and/or truck, space flexibility (4) ▪ Infrastructure in place (3) ▪ Land availability within region and at Port offer opportunity for development (1) 	<ul style="list-style-type: none"> ▪ Potential shortage of labor – if looking at 3-4 services, 400-person labor force may not be sufficient. Companies struggling to find skilled manual labor in the region. PMA should be urged to continue to hire. On the other hand, could draw labor from Puget Sound. (9) ▪ Demonstrated history of operating loss. Whether Port or private outfit, no one has made any money here. (8) ▪ Market size (4) ▪ High cost trip from the ocean to Portland. Two pilotages – cost recaptured in rates (4) ▪ Political roadblocks to infrastructure due to environmental community/protectations (3) ▪ Terminal itself is not the right scale - too big for small opportunities/too small for big opportunities (3)

Opportunities	Threats
<ul style="list-style-type: none"> ▪ Strong truck/rail connections – N/S/E/W and tracks available. Development of major distribution centers (Amazon – Troutdale). Transload opportunities promoting West Coast transload could lead to potentially more attractive rates – distribution factor important for companies. Intermodal hub. (17) ▪ Blank slate for innovation – no displacing current customers. Try new technologies and incorporate to get speed to market (6) ▪ Continued demand for service (6) ▪ Regional economic growth strong/outlook good (3) ▪ Strong political support. Interest from leaders to explore new approaches (3) ▪ Lots of westbound volume – business case easiest if can attract inbound cargo (2) 	<ul style="list-style-type: none"> ▪ Underutilized port to the north – ability to compete ▪ Timing – every day that goes by it is harder to get container service going again ▪ May be our last opportunity for this to happen - we need to get it right ▪ Costs to ramp up to a profitable terminal. Burn-in costs can kill success before you get running properly ▪ Labor (5)

Step 4 - The consultant team combined the results of the two analyses.

The combined analysis noting the variances between the committee and Port staff was presented to the ILC on September 28, 2017.

Combined Summary with Variations Identified

(Italics indicates ILC observations - Variances identified in Blue)

Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ Good transportation access (especially rail and barge) ▪ Infrastructure in place/Turnkey terminal is ready to go ▪ Lack of local competition/Sole container facility in OR centrally located for exporters ▪ Location/Strong shipper support has competitive advantage for OR, ID, SW WA and Eastern WA shippers ▪ Land availability within region and at Port offer opportunity for development (1) 	<ul style="list-style-type: none"> ▪ Geographical challenges <ul style="list-style-type: none"> – Extra steaming time up river, fuel, pilotage, draft, size of ships limited to less than 6800 TEUs ▪ Global perception of labor as undependable/not always available to work ship, cranes or trains/<i>Potential shortage of labor</i> ▪ Past financial model unsustainable (heavy Port allocations, terminal not right sized for volume). <i>Facility too big for small opportunities/too small for big opportunities. Demonstrated history of operating loss. Whether Port or private outfit, no one has made any money here. (8)</i> ▪ Market size (4). ▪ Political roadblocks to infrastructure due to environmental community/protectons (3)
<p>Strengths identified were aligned between ILC and Port staff</p>	<p>Weaknesses identified were aligned between ILC and Port staff</p>

Opportunities	Threats
<ul style="list-style-type: none"> ▪ Strong state-wide Public Interest for a Container Terminal at Terminal 6 ▪ Good for Niche services such as Smaller vessels serving: <ul style="list-style-type: none"> – South America – Australia – Japan (out ports) ▪ Inland Barge Service ▪ On-dock Intermodal Yard ▪ Strong truck/rail connections – N/S/E/W and tracks available. Development of major distribution centers (Amazon – Troutdale). Promote transload opportunities promoting West Coast transload (IPI) could lead to potentially more attractive rates – distribution factor important for companies. Intermodal hub (17) ▪ Blank slate for innovation – no displacing current customers. Try new technologies and incorporate to get speed to market (6) ▪ Continued demand for service (6) ▪ Regional economic growth strong/outlook good (3) 	<ul style="list-style-type: none"> ▪ Labor unpredictable/<i>Labor</i> (5) ▪ Time frame to reintroduce containers at Terminal 6 is short (12-18 months). Timing – every day that goes by it is harder to get container service going again. May be our last opportunity for this to happen - we need to get it right. ▪ Costs to ramp up to a profitable terminal. Burn-in costs can kill success before you get running properly ▪ Consolidations of carrier services (development of new alliances with larger ships) ▪ Cargo owners have moved on – developed new supply chains without Portland (primarily imports, both import and export in some cases) ▪ Underutilized port to the north – ability to compete
<p>Opportunities identified by both ILC and Port staff are in alignment. The largest variance was that the ILC described the regional economy and the opportunity of innovation as opportunities. The staff on the other hand look in more detail at potential geographical markets.</p>	<p>Threats were also very much aligned between the two groups. The major difference was the staff identified consolidation of carriers and in their discussion identified Seattle/Tacoma as a threat, whereas the ILC identified port competition in their reference to underutilized ports to the north.</p>

3.4 SWOT Summary

In summary, both internal Port staff and the external ILC identified similar themes in all four SWOT categories. Both groups were very honest in their evaluations of Terminal 6 identifying strong opportunities for the terminal while understanding that the location upriver puts cost barriers onto potential customers. The benefits of strong inland transportation connections, especially barge and rail, are shared both internally and externally as represented by staff and the ILC.

The two groups also recognize the challenges ahead for the combined effort to return containerization to Terminal 6. These include location, concerns over labor dependability, global perception of the terminal ability to be successful, costs, and the ability to right size the terminal correctly for the potential customer base (including allocation of port charges against the terminal).

4. Task 4 - Terminal Operating Models

4.1 Introduction

Advisian identified four typical models used by port authorities in North America to operate and/or manage their container terminals. The models are:

1. **Operating Port Terminal** - The public port authority owns and operates the terminal. The port is fully responsible for all management aspects of the terminal as they own and operate all equipment and terminal infrastructure.

This was the operating model the Port used from 1974 to 1993.

2. **Semi-Operating Port Terminal** - The port may or may not have a specific container terminal but has a "common" public wharf used for vessel operations. Storage and gate operations may be controlled by a separate terminal operator. In this model, the port owns the wharf and the terminal and may participate in the management of the terminal but contracts out the operation of the terminal to a terminal operator who hires the labor for the operational aspects, specifically the vessel operations. The equipment can be owned by the port or be provided by the terminal operator. Port ownership of the land and their hiring a terminal operator to run the operation is the basis of this model.

This was the operating model the Port used from 1993 to 2011.

3. **Landlord Terminal** - The public port authority owns the terminal but leases it out to a terminal operator or ocean carrier to perform the operations within the leased area. Under this model, the port has no management control nor responsibility for the terminal operations. The port may or may not own the terminal operating equipment but usually owns the ship to shore cranes. Maintenance of the cranes can be the responsibility of the port or the lessee depending on local practices, labor agreements, labor contract or lease agreement.

This was the model used by the Port from 2011 to 2017.

4. **Concession Terminal** - The public port authority offers a long-term concession to a tenant. Concessions usually range from 25 to more than 50 years. This model usually requires the concessionaire to provide the terminal equipment and all capital improvements to the terminal area (including: pavement, terminal technology, gates, buildings, etc.). Crane maintenance can be the responsibility of the port or the concessionaire depending on work rules, local practices or contractual obligations. All other equipment is owned by the concessionaire. The port typically has no exposure to maintain any terminal assets.

Below, we have identified the characteristics of each operating model by reviewing the following perspectives:

- Financial – Operating Expense ("OpEx") and Capital Expense ("CapEx")
- Ocean Carrier
- Terminal Operator
- Port

- Shipper
- Labor
- Public
- Risks to the Port

The risk/reward and control aspects of the four models can be summarized in the spectrum of lowest to highest in the following graphic.

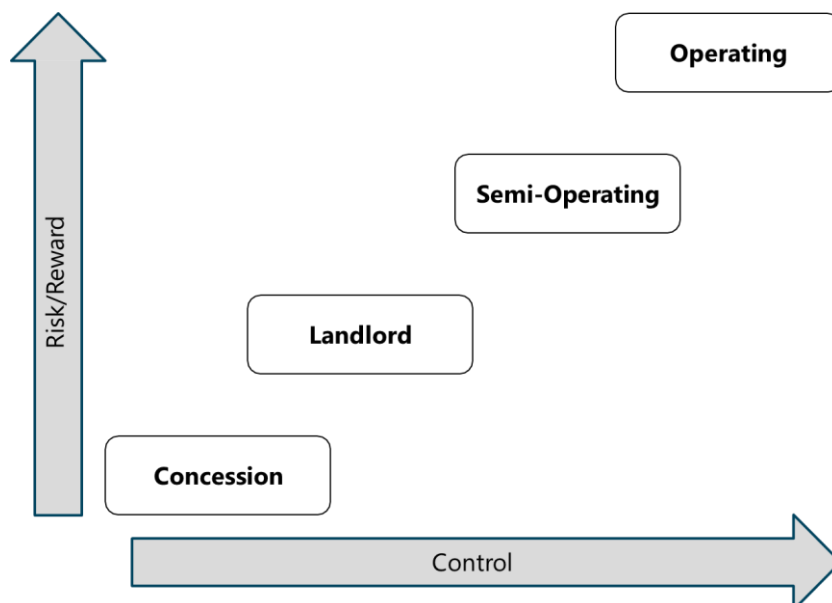
Figure 6 shows the differences between the four models in terms of risk/reward and control. In the Port Operating model, the port has all the control and all the risk. In the Semi-operating model, the port has medium risk, medium control. In the Landlord model, the port's risk is mitigated. In the Concession model, the port has low risk and low control, but there are examples where this has fallen apart. Examples are:

- Ports America left Port of Oakland's Outer Harbor Terminal.
- Terminal 5 in Seattle closed for a potential modernization project. APL left Seattle's Terminal 5 and moved to Southern California when they determined that it was \$9-10 million a year less expensive to buy-out the concession contract in Seattle than continue the contract. They also needed to make their minimum annual guarantee in Southern California.
- The Portland lease with International Container Terminal Service, Oregon Inc. (ICTSI) was terminated.

The following section discusses the details of each aspect and the basis for our opinions and conclusion for each model review.

For each model, Advisian identified ports and terminals that are operating under that model.

Figure 6 Risk/Reward versus Control Spectrum



4.2 Terminal Model Evaluation Components

4.2.1 Similar Ports and Terminals

Models of different operational modes are useful to determine both the success of a specific model of operations to the size of the Port and the market in which the Port competes. The purpose of such an analysis is to provide the Port of Portland with similar operating models from which the success or non-success can be compared to Portland's activities and potential operating model. Based on knowledge of the North American container terminal market, Advisian identified ports and terminals in all sizes to determine the model each terminal/port employs. Table 26 is a listing of those terminals identified through research.

Table 26 North American Terminals

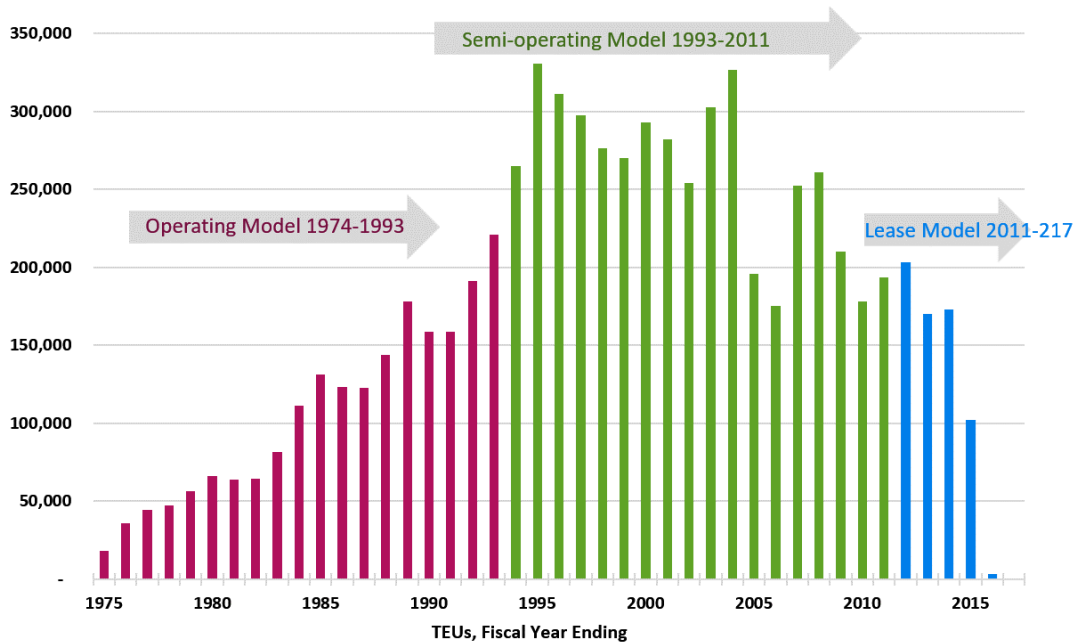
NAFTA Region Container Traffic 2016		
Port Management Type	Port (Province/State)	TEUs
Port Operating	Canaveral (FL)	3,124
	Savannah (GA)	3,644,518
	All terminals, Charleston (SC)	1,996,275
	Honolulu (HI)	1,211,997
	Miami (FL)	1,028,156
	Wilmington(DE)	362,492
	Palm Beach (FL)	267,280
	Wilmington(NC)	260,195
	Connelly Terminal, Boston (MA)	248,391
	Kahului (HI)	109,065
	Freeport (TX)	91,411
	Galveston (TX)	35,414
	Kalaeloa Barbers Pt. (HI)	11,038
Semi-operating	Gulfport (MS)	165,095
	San Diego (CA)	142,764
	Hueneme (CA)	83,600
Landlord	All terminals, Los Angeles (CA)	8,856,783
	All terminals, Long Beach (CA)	6,775,173
	All other terminals, New York/New Jersey	4,251,953
	All terminals, Northwest Seaport Alliance	3,615,752
	All terminals, Oakland (CA)	2,369,631

NAFTA Region Container Traffic 2016		
Port Management Type	Port (Province/State)	TEUs
	All terminals except PMT, Virginia	1,635,707
	Bayport Terminal, Houston (TX)	1,182,720
	All terminals, Port Everglades (FL)	1,037,226
	Barbours Cut, Houston (TX)	1,000,000
	Jacksonville (FL)	968,279
	Seagirt Baltimore	869,485
	Anchorage (AK)	471,166
	Packer Ave Terminal, Philadelphia (PA)	459,701
	Tampa Bay (FL)	49,716
	Port Manatee	28,191
Concession	Roberts Bank Terminal 2, Port of Vancouver (BC)	2,400,000
	Deltaport Terminal, Port of Vancouver (BC)	2,400,000
	Maher Terminal, New York/New Jersey	2,000,000
	PMT, Virginia	1,020,000
	Napoleon Avenue, New Orleans (LA)	522,364
	APMT Terminal, Mobile (AL)	272,734

4.3 Operational Aspects

Figure 7 summarizes the history of Terminal 6 container volumes from 1975 to the close of the terminal in 2016.

Figure 7 History of Terminal 6 Container Volumes 1975-2016



There is no right operating model for a terminal the size of Terminal 6. The best choice for a model is the model that works best for the tenant and Port. Based on the market research data from Task 2, the Portland regional market in 2014 was approximately 406,000 TEUs.

Using 406,000 TEUs as a guideline, the following U.S. terminals with less than 500,000 annual TEUs have been identified as examples of four operating models.

Port Operated Terminals

- Wilmington (DE) 363,000 TEUs;
- Palm Beach (FL) 267,000 TEUs;
- Wilmington (NC) 260,000 TEUs;
- Connelly Boston 248,000 TEUs; and
- Kahului (HI), Freeport (TX), Galveston and Barber Pt (HI) are all <100,000 TEUs.

Semi-Operating Terminals

- Gulfport 165,000 TEUs;
- San Diego 142,000 TEUs; and
- Port Hueneme 84,000 TEUs.

Landlord Terminals

- Anchorage 471,000 TEUs;
- Philadelphia 460,000 TEUs;
- Tampa 50,000 TEUs; and
- Port Manatee 28,000 TEUs.

Concession Terminals

- APMT Mobile, 273,000 TEUs.

Based on an unknown future size of the captured market, conservative scenarios were used for evaluation of fit of each operating model with Terminal 6.

The ability to maintain constant and reliable productivity is dependent upon the number and type of vessel calls per week and cargo volume. Based on the findings from Task 1, it was determined that a call to Portland on a transpacific deployment string with Portland as the sole port of call is not likely. Thus, a call to Portland would mostly likely occur as part of an existing deployment.

The realistic market capture is only 40% of the maximum 406,000 TEUs, or 162,400 TEUs representing approximately 90,200 lifts. This conservative market share was chosen based upon the actual market capture of 195,000 TEUs (48% of 406,000) in 2014. With a weekly service call (and disregarding seasonal peaks), this market share would equate to 1,735 containers per week (import and export, without empties) or with a 20% empty factor, 2,080 containers would be handled per vessel call.¹⁵

With an average vessel size per call of 5,100 TEUs (with a 95% load factor), this would mean 40% of the vessel would be Portland containers, including empties.¹⁶

From Task 1, having more than one vessel call per week at this level of volume would result in a lower percentage of Portland regional cargo per vessel which would make it even costlier for a carrier to call Portland.

4.3.1 Financial Aspects

Operating Expenses (OpEx)

Operating Expenses (OpEx) are the costs associated with the loading and unloading of the vessels as well as the terminal and gate operations. In addition, the maintenance of the terminal will be under OpEx unless some capital expenditure is undertaken. OpEx will have base costs but will have variable costs based upon productivity, volume, and model type.

¹⁵ Assuming containers, loaded and empty are balanced in off-loads and loads; this would be 1,040 containers off-loaded and load per vessel call.

¹⁶ $5100 \times .95 = 4845$ TEUs; $1,040$ containers $\times 1.8$ TEUs/container = 1872 TEUs. $1872/4845 = 38.6\%$

Capital Expense (CapEx)

Capital expenses (CapEx) are the costs associated with the development of the terminal and the purchase of major container handling equipment such as ship-to-shore cranes, rubber-tired-gantry cranes, reachstackers, toploaders, side picks, and other container handling equipment. Major terminal infrastructure such as electrical, communications, buildings, and pavement would also be included in this category. Furthermore, any infrastructure for automation (or semi-automation), including existing terminal operating system technologies, would be included in this category.

4.3.2 Carrier's Perspective

The carrier's perspective would include tangibles and intangibles concerning maintaining their deployment strategies. This would include berth availability, vessel and terminal productivity (and resultant costs), alliance alignment, and availability of the containers as required by the beneficial cargo owner. Some carriers would prefer the ability to operate the terminal with their own operating arm.

Vessel and terminal productivity is a key element but is measured typically using the following criteria all designed to turn a vessel within a scheduled time slot:

- **Vessel Productivity** - The number of lifts per vessel per hour at berth (does not include arrival or departure berth occupancy).
- **Vessel Call Productivity** - The number of lifts per vessel per hour in port (includes the arrival and departure activities outside the purview of the terminal) and the number of cranes available to work the vessel.
- **Crane Productivity** - Number of total lifts per gross working hour per crane and the number of total lifts per the net crane working hour (the gross number of hours worked less downtime, idle time, etc.).
- **Terminal Storage Productivity** - Number of containers (or TEUs) handled per acre of container yard storage. Terminal storage is predicated on the number of times the yard is turned over each week (or month or year) which is a direct result of the dwell time for each category of container (Imports: loaded, empty, and Exports: loaded and empty) experienced over an indicative period.
- **Terminal Dwell time** - The full amount of time from vessel discharge to gate departure for imports or the reverse for exports and the average dwell time for empty containers.
- **Truck Turn-time** - The amount of time a truck is captured by the terminal, from entering the gate queue, delivery and/or pickup of container and gate departure activities (which will include an inspection and the performance of necessary repairs or the switching out of a chassis or an empty container).

4.3.3 Terminal Operator's Perspective

The greater operational control the terminal operator exerts, the more opportunity for revenue to the operator. The more productive and efficient the operations becomes, the more profitable a terminal should become.

The other major concern of an operator is the requirements placed on the terminal or terminal operator for issues that may be outside of their control. One leading example is a minimum annual throughput guarantee placed on a lessee or a concessionaire, particularly if that operator is not a shipping line.

A terminal operator is also very conscientious of their productivity measurements. In addition to tracking their customer (the carrier) with the aforementioned productivity measures, the operator also closely tracks:

- **Berth Productivity** - The total number of lifts per meter of occupied berth per year.
- **Terminal Storage Productivity** - Number of containers (or TEUs) handled per acre of container yard storage. Terminal storage is predicated on the number of times the yard is turned over each week (or month or year) which is a direct result of the dwell time for each category (load, empty, import, export and empty) experienced over an indicative period.
- **Terminal Dwell Time** - The full amount of time from vessel discharge to gate departure for imports or the reverse for exports and the average dwell time for empty containers.
- **Truck Turn Time** - The amount of time a truck is captured by the terminal, from entering the gate queue, delivery and/or pickup of container and gate departure activities (which will include an inspection and the performance of necessary repairs or the switching out of a chassis or an empty container).

4.3.4 Port's Perspective

In general, the port's perspective will be based upon the "customer's" perception of the terminal and its operations. The problem is many ports do not have a clear definition of who their customers are and what is expected of the port from each of their customer groups.

Many ports consider their customer to be the beneficial cargo owner or shipper (which could be a logistics service provider) who is seeking reliability, continuity, and costs as their primary success targets.

Other ports consider the ocean carrier as their customer. This customer, as described previously, seeks deployment schedules that fill up vessels and maximize revenue.

To satisfy their customer base, the port will also track the productivity measurements identified previously both from a customer service perspective but also for revenue potential.

Finally, all public ports, regardless of who the port defines as their customer base, consider the public as their ultimate customer. This includes the public's perceptions of the politics associated with managing the port, the revenues received for the use of public lands and the environmental aspects of being a good corporate citizen.

4.3.5 Shipper's Perspective

A beneficial cargo owner, shipper, or contracted logistics service provider, all view their supply chain as being port agnostic for the most part. Advisian has performed 10 recent studies where we have interviewed shippers (with over 1,500 responses) for a variety of clients ranging from government entities to private terminal investors and the results were all the same. The results of the interviews concluded that a shipper primarily needs absolute reliability for their supply chain integrity and, therefore, they require a scheduled service

commitment to maintain a published schedule (no ghost sailings). This is true even if the schedule is once a month.

Cost is the other key factor for shippers. From the studies, the port or terminal component of the total supply chain was identified to be less than 5% of the total cost. This means that while a terminal cannot be out of the normal range on costs; service and reliability are items shippers are willing to pay for with a marginally higher cost at the terminal.

4.3.6 Labor's Perspective

Cargo Handling - All cargo handling at Terminal 6 has been performed by the International Longshore and Warehouse Union (ILWU) since the terminal opened in 1974. From 1974 to 1993, the Port hired ILWU labor directly (but was not a Pacific Maritime Association (PMA) member). From 1993 to 2011, the Port contracted ILWU labor through Marine Terminals Corporation (MTC) and later Ports America Group after they acquired MTC. As a PMA member, labor was administered under the terms and conditions set forth in the Pacific Coast Labor Agreement. From 2011-2015, the Port's terminal operator ICTSI, as a new PMA member, also used ILWU labor under the agreement. It can be assumed that the ILWU will retain this work under future agreements, leases, and operating models given their traditional jurisdiction and the fact that virtually all the major container carriers and stevedores/terminal operators are PMA members and are thus required to use ILWU by agreement.

General Terminal Maintenance - The Port has a collective bargaining agreement with the electricians from the District Council of Trade Unions (DCTU) for marine terminal maintenance. These are Port employees. Under the agreement, the DCTU retains jurisdiction if the Port leases the terminal. This local of the DCTU has had this jurisdiction since the start of Terminal 6 operations in 1974 and at other Port marine terminals before that. It can be assumed that the DCTU believe they will continue to have jurisdiction for terminal maintenance and will require that the Port follows prior practices in the future performance of general terminal maintenance under future agreements/leases/operating models.

Crane/Yard Equipment Maintenance

- The DCTU have jurisdiction over electrical maintenance of the gantry cranes. Per the DCTU agreement, this is not expected to change under future agreements/leases/operating models.
- The ILWU has traditionally performed crane mechanical and yard equipment maintenance at Terminal 6. It can be assumed that the ILWU will perform crane mechanical maintenance and yard equipment maintenance under future agreements/leases/operating models.

Terminal Security - The Port has an agreement with ILWU Local 28 for marine terminal security. These are Port of Portland employees. Under the agreement, Local 28 retains jurisdiction if the Port leases the terminal. It can be assumed that ILWU Local 28 will perform marine security under future agreements/leases/operating models.

4.3.7 Public Perception

The public is the largest and often the most vocal shareholder the Port has. They view the Port as partially funded through their tax dollars and want to be certain that Port management is using the money wisely and to support regional economic growth while being good environmental stewards. Like most things in the

public sector, the perception is often formed by what they read in the local paper, on social media, or hear on local news reports. Aside from good management, cargo growth, and profitability, a good public relations effort is essential to ensure the best possible relationship with this sector.

4.3.8 Overall Risk to the Port

The risk to the port can be economic (i.e., capital expenditures, ongoing maintenance of terminals or equipment, or through large port operating losses) or through entrusting others with control of port assets and operations such as in a concession or a landlord model. Ironically, mitigating operating risk results in loss of control and gaining control exposes the port to more operating risk. Loss of business, as in the case of the container trade in Portland, creates great risk in terms of potential lack of political and/or public support for the ongoing activities or certainly for future capital needs.

4.4 Discussion of the Four Terminal Management Models

4.4.1 Terminal Model - Operating Port Terminal

4.4.1.1 Similar Ports and Terminals

South Carolina Ports Authority, Georgia Ports Authority, North Carolina Ports Authority, Conley Terminal at Massport.

Operational Aspects. In this model, the port controls all aspects of the operations, maintenance and expansion/development including hiring of labor. While the southeast ports operating under this model employ labor as state employees; Portland, like Massport, is unlikely to be able to run the terminals with port employees. The current ILWU coastwide contract precludes this, although past practices have included an agreement with that covers port employment for some terminal related services under the DCTU agreement as identified above.

4.4.1.2 Financial Aspects

OpEx. Typically, this can be a lower cost model if port employees can be used. In theory, the port collects all user fees in the form of revenues. These user fees should be the same that a terminal operator would charge users for the use of the terminal. The port then pays all operating expenses out of the revenue collected and retains the resulting profits (if any). The primary risk to the port is labor productivity and volume throughput. If either factor drops, the results may be reflected in large operating losses. The charges to carriers would be published in a public tariff or potentially negotiated between the carrier and the port, if a line were to commit to an annual volume guarantee.

CapEx. The assumption is that all ship-to-shore cranes are operational and do not need to be modified. The assumption is also that the terminal will not be modified to be semi-automated. CapEx could still be necessary if volume was to spike and more equipment was needed.

4.4.1.3 Carrier's Perspective

Advantages. The terminal is neutral (not controlled by competitor's terminal operations) and the port-controlled labor force is steady meaning productivity should be consistent.

Disadvantages. Because there is a steady labor force, the costs may be slightly higher to maintain the labor. For example, key crane operators in South Carolina are paid a salary based on 2,080 hours per year with overtime. The terminal sees a lower hourly rate (and lower benefit rates) but they are spread out over a higher number of hours. This labor option will not be available at the Port of Portland due to the current coastwide ILWU contract.

4.4.1.4 Terminal Operator's Perspective

Advantages. There are none. There is not a third-party terminal operator as the port acts as the terminal operator. There may be other activities that the port may subcontract out such as stevedoring activities.

Disadvantages. Terminal operators do not have, other than potential stevedoring opportunities, the potential for providing services, achieving management efficiencies of operating more than one terminal or attracting carriers based on relationships established at other ports.

4.4.1.5 Port's Perspective

Advantages. The operating port terminal model offers steady labor, potential for consistent productivity, control over operations and facilities and the ability to control costs.

Disadvantages. Steady labor means that labor is being paid whether they have work or not. The low and mid-range volume scenarios do not make this model promising unless an on-call labor model is used. The port is also exposed to both productivity and volume risks as well as environmental (storm water, spills, etc.) compliance risks.

4.4.1.6 Shipper's Perspective

Advantages. The operating Port terminal model has potentially lower costs. For smaller niche carriers, the shipper may feel they are getting a "preferred service" typically reserved for in-house carriers (if a terminal is operated by a carrier owned operator).

Disadvantages. The terminal and management are not part of a larger network of terminals, thus equipment and facilities may not be the most modern or sophisticated nor does the terminal have the opportunity to call upon "reserves" from a sister terminal if needed. This may cause an operator to have a greater than normal redundancy plan.

4.4.1.7 Labor's Perspective

Advantages. Based on the above, labor would be ordered and compensated under West Coast Longshore Agreement for the ILWU cargo handling and equipment maintenance. Security and terminal maintenance and electrical maintenance are already inherently steady due to current DCTU agreement.

Disadvantages. The Port would want to negotiate a lower hourly rate and benefit rate. Georgia, South Carolina, and North Carolina labor are state employees and regardless of union status, receive pay and benefits controlled by the state employee system. This typically results in a substantial lower hourly cost and lower benefit cost when compared to the typical ILWU structure.

4.4.1.8 Public Perception

Advantages. The public may feel the port is taking control and may have better success in attracting and maintaining control over the labor and productivity.

Disadvantages. Port would be exposed to volume and productivity risks and the resultant impacts on the Profit and Loss Statement (P&L) to the port.

4.4.1.9 Overall Risk to the Port

Advantages. The port could potentially control costs which minimize risk, but remains exposed to volume and productivity risks.

Disadvantages. The port would be entirely responsible for capital investments in both the terminal and equipment as well fully responsible for all labor costs and terminal productivity. All of which could be a significant risk.

4.4.2 Terminal Model - Semi-Operating Port Terminal

4.4.2.1 Similar Ports and Terminals

Gulfport, MS; Port of San Diego, CA and Port of Hueneme, CA

4.4.2.2 Operational Aspects

In this model, the port runs the terminal as a container or multipurpose terminal that can handle containers, but is not limited to containers. The port controls all aspects of the marketing, operations, maintenance, and expansion/development including hiring of labor or the contracting of labor through a third party. The port collects all of revenues charged for operations, pays for all operating expenses, and retains the resulting profits. The charges to customers would be published in a public tariff or could be negotiated if there is a customer willing to commit to a volume guarantee.

4.4.2.3 Financial Aspects

OpEx. This often is a low-cost model as the port retains the cash flow and profits received from the terminal. As a public entity, the port may have a lower required rate of return than a private terminal operator that can be passed through to the customers when setting the tariff charges or assessing the negotiated rate.

CapEx. The assumption is that existing cranes are operational and do not need to be modified. The assumption is also made that the terminal will not be modified to be semi-automated and that the port has or can get access to the required cargo handling equipment at a fair price.

4.4.2.4 Carrier's Perspective

Advantages. The terminal is neutral (not controlled by competitor's terminal operator) and the labor force may be "steady" meaning productivity is level as the terminal has experience labor returning day after day to the same operating model and equipment.

Disadvantages. Because labor is steady, the costs may be slightly higher to maintain the labor. For example, key crane operators in South Carolina are paid a salary based on 2,080 hours per year with overtime. The terminal sees a lower hourly rate (and lower benefit rates) but they are spread out over a higher number of hours. This steady labor model may pose inefficiencies in matching the workforce to daily ebbs and flows of cargo flows.

4.4.2.5 Terminal Operator's Perspective

Advantages. A terminal operator could in fact be hired by the port as in the case of Portland Terminal 6 under the MTC arrangement. There may be other activities that the port may subcontract out such as stevedoring activities.

Disadvantages. Terminal operators have limited potential for providing services at the terminal.

4.4.2.6 Port's Perspective

Advantages. Potentially, a full-time labor force may provide consistent productivity over an "on-call" labor model, control over operations and facilities, which should give the port the ability to control fixed costs.

Disadvantages. A full-time labor force means labor is being paid whether they have work or not. The low and mid-range scenarios do not make this model promising unless the labor is on an "on-call as needed basis". The port is still at risk for productivity, volume, CapEx, OpEx, environmental risks (spills, storm water, etc.).

4.4.2.7 Shipper's Perspective

Advantages. The semi-operating port terminal model offers potentially lower costs. For smaller niche carriers, a shipper may feel they are getting a "preferred service" typically reserved for in-house carriers (if a terminal is operated by a carrier owned operator).

Disadvantages. The terminal and management are not part of a larger network of terminals. Thus, equipment and facilities may not be the most modern or sophisticated, nor does the terminal have the opportunity to call upon "reserves" from a sister terminal if needed. This may cause a shipper to have a more robust than normal redundancy plan.

4.4.2.8 Labor's Perspective

Advantages. Based on the above, labor would be more than likely steady for the ILWU cargo handling and equipment maintenance. Security and terminal maintenance are already inherently steady.

Disadvantages. The port would ideally like to negotiate a lower hourly rate and benefit rate. Georgia, South Carolina, and North Carolina labor are state employees and regardless of union status, receive pay and

benefits controlled by the state employee system. This typically results in a substantial lower hourly cost and lower benefit cost when compared to the typical ILWU structure. While this labor model works in the South Atlantic ports, it is unlikely to be able to be implemented elsewhere.

4.4.2.9 Public Perception

Advantages. The public might perceive that the port is taking control of the terminal and, therefore, would have better success in attracting and maintaining control over the labor and productivity as well as servicing customers.

Disadvantages. Political influences could impact daily operations.

4.4.2.10 Overall Risk to the Port

Advantages. The port could potentially control costs which minimizes risk.

Disadvantages. The port would be entirely responsible for capital investment of both the terminal and the equipment as well labor relations and productivity. These expenses and relationships could pose a significant risk, especially if volumes were to decline for any reason (i.e., global economics or a line leaves the terminal).

4.4.3 Terminal Model - Landlord Terminal

4.4.3.1 Similar Ports and Terminals

Terminals at Ports of Los Angeles, Long Beach, Oakland, Jacksonville, Port Everglades, Seattle/Tacoma.

4.4.3.2 Operational Aspects

The long-term landlord approach is a model involving a long-term single tenant operating and use agreement. The port is an active landlord in this type of terminal model (i.e., ICTSI). Management control is a combination of public and private where, the port leases the land/terminal to a carrier or terminal operator who in turn operates the terminal for a set period of time. The port may or may not offer the operator equipment to rent such as cranes and other terminal related equipment. Labor agreements may follow the ownership of the equipment. For example, Port of Tacoma owns cranes and cargo handling equipment that they rent on an hourly basis to the terminal operator. The rental rate includes fuel and maintenance of the equipment. Thus, the Port of Tacoma uses its labor union to maintain the rented equipment for the terminal operator. The agreement may also include provisions about port versus private investments and volume guarantees or revenue sharing commitments made by the tenant.

4.4.3.3 Financial Aspects

OpEx. Port resources for operating expenses are limited to what is specified in the lease agreement. For example, the port may offer rental equipment, and other services such as security, building maintenance, etc., that the port has available depending on local union agreements.

CapEx. Port investment is also outlined in the terminal lease. This lease may be a bare ground lease or up to and including a full turn-key facility minus the personnel and labor required to operate the terminal. The aspects of the lease agreement are all negotiable during the lease negotiation discussions.

4.4.3.4 Carrier's Perspective

Advantages. If the carrier or its sister terminal operating unit is the tenant, then the carrier has much more control over the operations of the terminal including the hiring and scheduling of labor, equipment, and berthing space. Since the tenant has full control over the activities and infrastructure within the terminal boundaries, the carrier can try to negotiate terms with the terminal operator that are more favorable to the carrier and the carrier's cargo mix.

Disadvantages. Since this terminal is a stand-alone facility, the carrier does not have the ability to achieve the economies of scale of multiple terminals.

4.4.3.5 Terminal Operator's Perspective

Advantages. The terminal operator has control over the terminal and its uses per the lease agreement with the port. That being the case, the terminal operator can scale its services based upon the customer base it has at the terminal. The terminal operator may be able to market the terminal and the respective services to whomever fits the terminal operator's business model if it is allowed under the lease agreement with the port. The agreement may have "contract openers" where the agreement is renegotiated or extended for a set number of years based upon past financial results.

Disadvantages. The terminal operator is held to the language of the lease for the duration of the lease. If the terminal operator was not able to negotiate away risks such as cargo handling equipment ownership and repair, then the terminal operator must attract enough cargo to cover all the fixed and variable costs of operating the terminal and meet profit expectations of their management or owners.

4.4.3.6 Port's Perspective

Advantages. The port and lessee are held to the language of the lease agreement. The majority of the risk is placed on the lessee unless the lessee was to default. This scenario recently happened in both Seattle and Oakland.

Disadvantages. The port will be held accountable by the public and labor for the behavior of the lessee even though the port has passed that responsibility on to the tenant.

4.4.3.7 Shipper's Perspective

Advantages. The shipper may have a working relationship with the tenant at another port that can be leveraged into better pricing structure for services rendered to the shipper at this terminal.

Disadvantages. The local shipper may not be able to use their political influence on the tenant as they may be able to on the port, if the terminal was port operated.

4.4.3.8 Labor's Perspective

Advantages. The tenant may have good labor relationships with the ILWU and have experience that can be transferred to this terminal to help improve labor relations in Portland between the different parties.

Disadvantages. The tenant will probably have more experience with the ILWU on the West Coast and know the details of the ILWU contract very well as well as understand what are the normal coastwise practices.

4.4.3.9 Public Perception

Advantages. The public may be neutral to this operating model if the cargo is moved in a timely and environmentally friendly manner by the tenant or its contractors.

Disadvantages. Public opinion may have less influence over the tenant than the port.

4.4.3.10 Overall Risk to the Port

Advantages. Risks and their related mitigation options should be detailed in the terminal lease.

Disadvantages. The tenant may not be able to meet all contract obligations and the tenant may default or return the terminal to the port before the end of the lease.

4.4.4 Terminal Model - Concession Terminal

4.4.4.1 Similar Ports and Terminals

Port of Vancouver (BC) – Roberts Bank Terminal 2 and Deltaport Terminal; Maher Terminal, Port of New York/New Jersey; Napoleon Avenue, Port of New Orleans; APMT Terminal, Mobile, AL.

4.4.4.2 Operational Aspects

The Public Private Partnership (P3)/concession/equity approach has received much attention in recent years. This has been spurred on by private equity funds aggressively seeking infrastructure investment alternatives to add to their portfolio. In this model, the port signs a long-term lease with an entity partner (typically a terminal operator) to fully operate, market and maintain the terminal for multiple decades.

4.4.4.3 Financial Aspects

A concession arrangement is very complicated and difficult to negotiate. In this model, the port is a passive landlord. Management control is entirely private. The concession agreement will dictate the responsibilities of the parties named in the contract. The agreement may include volume guarantees or revenue sharing language. In most cases, the concessionaire takes on all the risk and reward and can set rates accordingly without much oversight from the port. Tariffs, lease revenue, etc., are set and collected by a private concessionaire. Contract terms are based on extensive analysis by both parties on the net present value of future terminal operating returns. Once the agreement is signed, all risks are retained by the concessionaire.

OpEx. Since this is a long-term arrangement, the concessionaire takes over all responsibility for the operations of the terminal, including labor and equipment.

CapEx. The concession agreement will outline the responsibilities of each party to the capital investment requirements. In the case of Portland, the concessioner would take the terminal as is and be required to make all required capital investments during the term of the agreement. One of the challenges of this type of arrangement to the port is that at the end of the lease, the terminal may have run out of useful life and may need a full rehabilitation to become viable or marketable to the next operator.

4.4.4.4 Carrier's Perspective

Advantages. The carriers may be neutral on the "ownership" of the terminal if the concessionaire provides a service level equitable to the cost of the services provided.

Disadvantages. Carriers may have less leverage with the concessionaire than with the port as the concessionaire is being held to reach certain profit expectations of their owners.

4.4.4.5 Terminal Operator's Perspective

Advantages. The concessionaire would be able to directly make decisions related to cost control and develop the terminal and service offerings in accordance with market demand and throughput.

Disadvantages. The terminal operator if not the concessionaire will be under extreme pressure to meet or exceed performance expectations related to profit and cash flow.

4.4.4.6 Port's Perspective

Advantages. All risks are passed on to concessionaire.

Disadvantages. The concession approach is a long-term deal with limited or no options to renegotiate the agreement, if the port underestimated the future returns of the terminal.

4.4.4.7 Shipper's Perspective

Advantages. Shippers may be neutral on this model if they believe they are receiving service equitable to the price they are paying for that service. The concessionaire may offer different pricing models depending on services levels provided to the shipper.

Disadvantages. There is limited port or political involvement in decision-making on the terminal, so shippers may believe they have lost their local leverage to influence terminal operations to their benefit.

4.4.4.8 Labor's Perspective

Advantages. Labor may be neutral if their contracts are followed in a manner that the unions believe is correct.

Disadvantages. The investors may not have the tolerance to work with labor on issues common to a port terminal.

4.4.4.9 Public Perception

Advantages. Depending on the public's view, this arrangement may be looked on as a good solution as the return to the port is set for the life of the concession agreement.

Disadvantages. The management of the terminal is entirely privately controlled, so public involvement in decision-making will be eliminated.

4.4.4.10 Overall Risk to the Port

Advantages. After the deal is ratified, there is potentially very limited risk to the port.

Disadvantages. If the port has underestimated the value of the terminal, there is no recourse. Although, should the concessionaire fail for whatever reason, the port may be "on the hook" for a variety of obligations.

4.5 Task 4 Summary

A recent article published in *The American Shipper* described findings very similar to findings in the previous tasks.¹⁷ The key takeaway from the article is that carrier consolidation is reducing the number of potential customers (carriers) that terminals can serve. The article author, AlixPartners, further states that independent terminals in leading port complexes are being driven to compete on pricing as there is no longer locked-in business. *"Overall, terminal operators with exposure to major hubs and gateways are experiencing falling margins, and the peers with operations in secondary and developing markets are seeing their margins improve."*

The key for Portland is that, in the author's mind, *"Consolidation among carriers, leading to the elimination of duplicate routes and a shift to larger vessels, will reduce the number of calls; alliances between shippers and terminals could further squeeze operators; the competition will be intense; and margins will be pressured."* Portland is not a gateway and the NWSA is in very strong competition with the Southern California gateway and potentially the Canadian ports to not only attract business but to maintain market share. AlixPartners created a Terminal Investor Strategic Decision Matrix, shown below in Table 27.

¹⁷ Braving Container Headwinds: a Playbook for Investors; by AlixPartners Partner October 2017

Table 27 Investment Decision Matrix¹⁸

TERMINAL INVESTOR STRATEGIC DECISION MATRIX	
<p>High ↑</p> <p>Port level growth/opportunity</p>	<ul style="list-style-type: none"> • Seek consolidation opportunities within the port • Invest in enhanced operational capabilities: <ul style="list-style-type: none"> - Improved infrastructure - Enhanced IT - Automation - Landslide capabilities/capacity
	<ul style="list-style-type: none"> • Drive down costs through operational efficiencies • Introduce automation when possible • Lock up long-term customer commitments
	<ul style="list-style-type: none"> • Improve customer/service segmentation to focus on niche market opportunity • Address lease/concession, labor contracts, and other major components of cost base • Divest/Exit
	<ul style="list-style-type: none"> • Develop value-added services • Expand footprint to related inland terminals and other infrastructure • Develop and exploit niche market opportunities
Low	Terminal competitive advantage
	High →

Portland would fit into the bottom quadrants of Table 26 with low growth opportunity (not a gateway). If Portland has a low terminal competitive advantage, then the Port should either divest/exit or do what is underway now; improving labor contracts and focusing on niche market opportunities. If, on the other hand, the Port feels Terminal 6 has a high competitive advantage over the NWSA, then the Port should continue to develop value-added services and develop and exploit niche market opportunities.

There are no definitive answers as to which operating model will be the best for the Port. The Financial Analysis will help to inform the Port on what it takes to break even and identify what volumes can be obtained and what amount of operating support may be needed.

¹⁸ Source AlixPartners, used with permission

5. Task 5 - Alternatives Analysis

5.1 Purpose

Based on the work of the preceding tasks, Advisian identified and evaluated potential container-related uses for Terminal 6. The goal of this task is to assess the feasibility of the different alternative uses that, either individually or in combination, can achieve the goal of providing market access to regional container shippers. The key to evaluating alternatives is the ability to serve direct transpacific liner services, feeder services to other container terminals on the West Coast, and/or spot or induced vessel calls.

Originally, Advisian focused on alternatives that directly supported local shippers and/or logistics service providers that would use Terminal 6 as their chosen container terminal for direct shipments. From the earlier task findings, it is clear that the ocean carrier alliances control a very significant portion of the transpacific trade lanes (89%) and that adding Portland to a vessel deployment string would result in additional costs to the carrier. These additional costs will most likely be passed onto the shipper. Likewise, it was also determined that the carrier alliances are focused on gateways able to accommodate larger vessels versus specific ports and terminals. Of the eight carriers that operate the 5,500-TEU vessels or smaller, six of these eight carriers have clearly indicated to the industry they are increasing their carrying capacity by adding larger vessels. While the largest vessels in the order book (more than 18,000 TEUs) are destined for trade lanes other than the Pacific, the result is a cascading of larger ships into the transpacific trade lanes. Advisian, using Alphaliner data, estimates that average vessel size in the transpacific will increase from 7,700 TEUs to 8,200 TEUs by the end of 2018.¹⁹ Furthermore, from this same analysis, the number of 5,100 TEU sized vessels will be decreasing from 90 to 85 by the end of 2018.

The Alternative Analysis options investigated in this study were:

1. Attract a carrier to Terminal 6, including alliance carrier or niche market carrier, with a specific priority for an Asian service.
2. Short sea shipping service between Portland and Vancouver, B.C.
3. Rail service options.
4. Trucking service options.
5. Equipment pooling service options.
6. Bulk container options and
7. Mixed use terminal options.

Costs

From the Task 1 analysis and from previous studies, Advisian determined that carriers (for the ocean transportation segment only) will charge an additional \$100 to \$200 per forty-foot equivalent unit (FEU) for a

¹⁹ This estimate is based upon calculations from Alphaliner data showing each carrier's fleet by size, the number of vessels in each trade lane and the new builds coming on line (less the vessels going out of their service).

Portland container over a Seattle/Tacoma container. In comparison, a Long Beach/Los Angeles container is \$100-\$200 per FEU cheaper than Seattle/Tacoma. The basis for these costs increments is the economy of scale and the consistency of the volume over the year. For reference, the Shanghai Container Freight Index for the ocean charges was \$1,411 per FEU²⁰ between Shanghai and Southern California. Advisian used the estimated costs for a very high level, comparison cost analysis found in Table 28.

A very important caveat on costs needs to be stated. The majority of containers handled at U.S. ports do not have a "published" breakdown of costs for the individual transportation aspects of the supply chain. Containers are normally handled with one bill of lading that includes the ocean costs, the terminal costs and the inland rail or trucking costs. Even when Advisian conducted individual research with personal interviews, the data always had the caveat that it was estimated and had the high potential of fluctuating depending on the market and the capacity constraints of the specific mode of transport. In other words, Table 28 is the consultant team's best estimate of the breakdown of costs of the supply chain.

To provide a high-level cost comparison, similar to what an importer or exporter would conduct, Advisian looked at two supply chains: 1) an export container with agricultural products from the Lewiston, ID, area being transported to Shanghai, China, and 2) an export container from a local Portland area shipper being transported to Shanghai.

For the Lewiston scenario, the following options were evaluated:

- Short sea shipping, via Vancouver, B.C., with truck delivery to Terminal 6 from Lewiston;
- Short sea shipping, via Vancouver, B.C., with rail delivery to Terminal 6 from Lewiston;
- Barge from Lewiston to Portland, loaded on vessel at Terminal 6;
- Barge from Lewiston to Portland, rail to Seattle/Tacoma;
- Barge from Lewiston to Terminal 6, truck to Seattle/Tacoma;
- Rail direct from Lewiston to Seattle/Tacoma;
- Truck direct from Lewiston to Seattle/Tacoma;
- Direct vessel call at Terminal 6, delivery from Lewiston by truck;
- Direct Vessel call at Terminal 6, delivery from Lewiston by rail; and
- Bulk Container at Terminal 6, delivery by rail from Lewiston.

²⁰ Alphaliner Newsletter No 46, 11 November 2017

Table 28 Cost Components²¹

Cost Component	Cost Per Container (FEU)
Ocean Carrier Costs	
NE Asia to LA/LB	\$ 1,411
NE Asia to Sea/Tac/Van	\$ 1,561
NE Asia to Portland	\$ 1,711
Short Sea Shipping Costs	
Portland to Vancouver	\$ 1,620
Barge Costs	
Lewiston to Portland	\$ 180
Rail Costs	
Portland to Seattle	\$ 700
Inland to Seattle	\$ 1,200
Inland to Portland	\$ 1,200
Truck Costs (carrier based pricing)	
Portland to Seattle	\$ 1,100
Inland to Seattle	\$ 1,100
Inland to Portland	\$ 1,100
Dray to terminal (<50 miles)	\$ 225
Terminal Charges	
Inland Barge Terminal	\$ 90
Portland Rail Yard with lift fee	\$ 103
Full in from truck; out by rail	\$ 232
Full in/out from Truck with gate and wharfage	\$ 209
Barge to truck	\$ 204
Barge to rail	\$ 158
Barge to CY	\$ 123
T6 Lift Tariff	\$ 335
Seattle Lift plus gate (truck or rail)	\$ 130
Vancouver Transshipment Per Lift	\$ 150

²¹ Notes:

1. Short Sea Shipping Vessel costs based on MARAD M-5 Marine Highway Analysis 2014
2. Terminal 6 Charges includes gate, storage, ship-to-shore crane lifts, IY lifts and rail drayage charges between IY and Terminal 6
 - Rail Yard \$80 includes gate, terminal and lift to/from rail plus \$23 lift fee at IY
 - Full in from truck; out by rail \$232 includes gate, terminal and lift to/from rail plus \$23 lift fee at IY
 - Full in/out from Truck \$209 Includes truck gate in/out and wharfage charge
 - Barge to truck \$204 River Barge only
 - Barge to rail \$158 River Barge only
 - Barge to CY \$123 River Barge only
3. Barge terminal is considered to be Lewiston, ID (Lift (2 lifts) and gate charges= \$180; lift charges at Terminal 6 is \$335 to transfer loaded container per tariff
4. Ocean costs, from Alphaliner, between NE Asia and Southern California is \$1411 per FEU. Seattle/Tacoma and Vancouver, B.C., are about \$100 per FEU higher; Portland is \$150 per FEU higher than Seattle
5. Seattle/Tacoma lift charges are \$130 per lift, including amortization, plus \$50 for gate charges
6. Vancouver, B.C., transshipment costs are \$300 for double move (one lift off short sea vessel; one lift onto ocean vessel)

For the Portland area origin, the following scenarios were modeled:

- Short sea shipping, via Vancouver, B.C., with truck delivery to Terminal 6;
- Rail direct from Terminal 6 to Seattle/Tacoma with truck delivery to Terminal 6;
- Rail direct from Portland (Union Pacific Railroad) to Seattle/Tacoma without Terminal 6;
- Truck direct from Portland to Seattle/Tacoma;
- Direct vessel calls at Terminal 6, delivery by truck to Terminal 6; and
- Bulk Container at Terminal 6, delivery by rail to Terminal 6.

5.2 Alternative - Attract Carrier to Terminal 6

The first alternative would be to attract a carrier back to Portland. In doing so, Advisian assumed that the shipper's desire for reliability and service offerings was prioritized above costs of using Terminal 6.²² From Task 2, the consultant team estimated the regional market potential is 406,000 TEUs exclusive of empties and intermodal containers. This regional market potential is based upon the 2014 data with Asia being the primary market (89% of the import market and 88% of the export market). Advisian projected that the realistic market capture is approximately 40% of the maximum market potential of 406,000 TEUs, or 162,400 TEUs representing approximately 90,200 lifts. With a weekly service call (and disregarding seasonal peaks), this would equate to 1,735 full containers per week (import and export) with a 20% empty factor, for a total of 2,080 containers handled per vessel call.²³ From the Task 6, Financial Analysis, it was determined that this volume level just meets a break-even point for a mixed-use, Port-operated terminal.

To attract a carrier, especially an alliance carrier, the Port would need to address several issues that plagued the previous operations. Without detailed knowledge of the remedies, Advisian believes that the Port has identified and addressed all the major issues confronting productivity, labor jurisdiction, equipment and infrastructure. The cost structure for the Lewiston scenario did not favor a Terminal 6 direct vessel option as trucking from the Lewiston (or other regional inland areas) directly to Seattle/Tacoma was the less expensive routing choice as shown in Table 29.

²² In over 10 separate studies in the last 5 years where over 1,500 shippers or their logistics service providers were surveyed or interviewed, the results were all the same shippers demanded that reliability was paramount in their carrier and port selection process; the second unanimous criteria for carrier selection was the service offerings provided (weekly, twice a week, etc.). Cost came in third in the hierarchy of decision criteria.

²³ Assuming containers, loaded and empty are balanced in off-loads and loads; this would be 1,040 containers off-loaded and load per vessel call.

Table 29 Lewiston Origin Supply Chain Costs

Supply Chain Costs Per Container (Inland Origin)									
Asia-Eastern Oregon	Truck to	Rail From	Inland	Short	T6	Transit	Ocean	Transship	Total
	Inland Terminal or T6	Inland Terminal	Terminal Charges	Sea/Barge Charges	Charges	to Seattle/Tacoma	Carrier Charges	Charges (BC or NWSA)	Charges to Shipper
Short Sea Shipping via Vancouver (Truck)	\$ 1,100	n/a	n/a	\$ 1,620	\$ 544	n/a	\$ 1,561	\$ 300	\$ 5,125
Short Sea Shipping via Vancouver (Rail)	\$ 225	\$ 1,200	\$ 180	\$ 1,620	\$ 670	n/a	\$ 1,561	\$ 300	\$ 5,756
Barge- Rail to Seattle/Tacoma	\$ 225	n/a	\$ 180	\$ 180	\$ 261	\$ 700	\$ 1,561	\$ 310	\$ 3,417
Barge-Truck to Seattle/Tacoma	\$ 225	n/a	\$ 180	\$ 180	\$ 204	\$ 1,100	\$ 1,561	\$ 310	\$ 3,760
Rail direct to Seattle	\$ 225	\$ 1,200	\$ 180	n/a	n/a	n/a	\$ 1,561	\$ 310	\$ 3,476
Truck direct to Seattle/Tacoma	n/a	n/a	n/a	n/a	n/a	\$ 1,100	\$ 1,561	\$ 310	\$ 2,971
Direct Vessel Call- Truck	\$ 1,100	n/a	n/a	n/a	\$ 544	n/a	\$ 1,711	n/a	\$ 3,355
Direct Vessel Call- Rail	\$ 225	\$ 1,200	\$ 180	n/a	\$ 438	n/a	\$ 1,711	n/a	\$ 3,754
Direct Vessel Call- Barge	\$ 225	n/a	\$ 180	\$ 180	\$ 458	n/a	\$ 1,711	n/a	\$ 2,754

However, for Portland area shippers, even with a higher ocean cost component, the lack of a truck or rail link to Seattle/Tacoma makes the cost for a direct call vessel very competitive, as shown in Table 30, with direct trucking to Seattle or Tacoma.

Table 30 Portland Origin Supply Chain Costs

Supply Chain Costs Per Container (Portland Origin)									
Asia-Eastern Oregon	Dray to T6	Rail/Truck	Short	T6 or	Transit	Ocean	Transship	Total	Charges to Shipper
		From Inland Destination	Sea/Barge Charges	Rail gate charge	to Seattle/Tacoma	Carrier Charges	Charges (BC or NWSA)	Charges to Shipper	
Short Sea Shipping via Vancouver (Truck)	\$ 225	n/a	\$ 1,620	\$ 544	n/a	\$ 1,561	\$ 300	\$ 4,250	
Rail to Seattle, T6 Truck in	\$ 225	n/a	n/a	\$ 335	\$ 700	\$ 1,561	\$ 310	\$ 3,131	
Direct Rail, no T6 interface (Non-BNSF)	n/a	\$ 225	n/a	\$ 150	\$ 700	\$ 1,561	\$ 310	\$ 2,946	
Truck direct to Seattle/Tacoma	n/a	n/a	n/a	n/a	\$ 1,100	\$ 1,561	\$ 310	\$ 2,971	
Direct Vessel Call- Truck into T6	\$ 225	n/a	n/a	\$ 544	n/a	\$ 1,711	n/a	\$ 2,480	

With the recently announced Swire Shipping service starting in Portland, the terminal has attracted a niche carrier with only a monthly call. The fact that Swire Shipping does not have a direct export service to the Asian market suggests the Port needs to continue to market the terminal to an additional carrier to supplement the Swire Shipping service. Per Swire Shipping’s shipping schedule as of November 29, 2017, their eastbound routing on their North Asia Trans Pacific China-Korea-Canada and West Coast Service is Shanghai-Dalian-Busan-Vancouver (BC)-Everett-Portland-Long Beach. Their westbound North Asia service (Canada > China) from the West Coast is Vancouver (BC)-Tianjin, Qingdao-Changshu. Their westbound Asia service for Portland exports will call Long Beach, Fiji, New Zealand, Australia, and Taiwan before China. The good news is that the arrival of Swire Shipping opens markets to the region not previously served out of Portland.

5.3 Alternative - Short Sea Shipping

Short sea shipping has often been proposed as the least cost transportation option with a comparable low carbon footprint. The authors of this study were engaged in 2013-2014 by the U.S. Maritime Administration (MARAD) to conduct a full analysis of the M-5 Marine Highway, a short sea shipping route that paralleled Interstate 5 from San Diego, CA, up into Vancouver, B.C. Two studies are referenced in this report, the first being the *West Coast Marine Highway Market Analysis Project Report* dated April 2014 and the *American Marine Highway Design Project, Final Report* dated October 28, 2011.²⁴ Both of these reports can be found on <https://www.marad.dot.gov/ships-and-shipping/dot-maritime-administration-americas-marine-highway-program>.

The key findings (in summary form) were based on the following relative key factors:

- Market capture;
- Public policy issues;
- Vessel type; and
- Terminal operations.

The bottom line for the study was that short sea shipping would be viable only if public policy was changed, specific short sea vessels were in service, and international (Canadian) cargoes were routinely involved. The basis for this analysis is further discussed below.

Market Capture

A successful marine highway will need to connect cargo (shippers) and transportation providers (carriers) along the following parameters:

- Density - the amount of cargo transported in a single move.
- Frequency - the number of times a transport move is made (weekly, biweekly, daily).
- Reliability - the ability to predict, on a consistent basis, the movement of cargo. This factor includes arrival, departure, time in transit, costs, security, and overall customer confidence in the move.
- Balance - the ability to have revenue moves in both directions (elimination or reduction of deadheading or empty non-revenue moves).
- Revenue/Cost - for a carrier/operator, revenue that creates a profit; for the shipper costs of transportation that maintains the economics of the pricing model for the commodity moved.

²⁴ Both of these reports can be found on <https://www.marad.dot.gov/ships-and-shipping/dot-maritime-administration-americas-marine-highway-program>.

The beneficial cargo owner (shipper) is focused on cost, reliability, transit time, and frequency. From the vessel owner/operator's (carrier's) perspective, the key parameters are profitability, rates (revenues), volume, and cost of operations, which are based primarily on density and balanced flows. The importance of each parameter will vary depending on the type of cargo and whether the trade flows are domestic or international (or a combination of both). The most cost-effective marine highway cargoes will be those already at the marine facilities.

For Portland, the assumptions made in these previous studies that would directly apply to Terminal 6 being used as a short sea shipping terminal would be:

- Surface transportation competition will be based primarily on truck rates. Where rail is competitive, rates tend to be equalized with trucking rates. Service issues differ, with rail at a disadvantage door to door with trucking and at par or better than marine highway.
- Drays to the port should be less than 50 miles to be practicable. The cargo's proximity to the port is a key issue due to cost and time associated with the dray.
- International cargo will provide the important primary or base cargo, to be augmented by domestic.
- For larger ports, the assumed stevedoring rates do not take into consideration special or extra gate processes that may be necessary to equalize marine highway service to truck which is essentially 24/7/365.
- Pricing target is assumed to be 20% less than trucking rate.
- Revenue assumptions are based on pricing at 20% discount off truck rates with a utilization of 95-100% unless otherwise noted. This very high and aggressive utilization is not really attainable but is used to illustrate the best case. In much of the analysis, more realistic utilizations are calculated to show potential profit or loss.
- Fuel costs will not be a critical variable based on use of current fueling options because those increases will be reflected in fuel surcharges imposed relatively equally across all modes.
- While no minimum market size was assumed, more cargo availability leads to a higher probability of success.
- Multiple port calls present a challenge that is not present in a two-port routing scenario based on the significant additional costs that must be borne with each incremental port call without obvious commensurate increases in cargo availability. Further, balancing volumes between multiple ports can be a difficult process that often results in less than optimum utilization on certain legs.
- The Harbor Maintenance Tax (HMT) will be enforced as it is currently and that its present value is \$75 per FEU container.
- Jones Act requirements will remain as they currently exist.

Public Policy Issues

Regulations to cargo moving through marine highways, vis-à-vis surface highways due to trade facilitation in the form of customs requirements (e.g., the "24-hour rule" and the manifest requirements), constitute an impediment to a marine highway's viability if not modified.

HMT adds an average of \$75 per FEU container to the shipping costs. The application of HMT to domestic port to port moves, as well as import cargo, provides a cost advantage to trucking. The tax adds costs and diminishes the competitiveness of the U.S. marine highway service. Elimination of the HMT marine highway cargo would contribute toward improving the ability of marine highway services to attract customers and cargo.

The Jones Act would not come into play if a Portland-Vancouver, B.C., route was used, but the study indicated a PNW service of Coos Bay, Astoria, Portland, Tacoma (or Seattle) and Vancouver, B.C., on a weekly basis would be potentially viable if the Jones Act would be revised for the recommended fleet of short sea shipping vessels. The Jones Act also plays a significant role in the crew staffing requirements of the vessel.

MARAD's mission, coupled with the nation's defense policy, requires a viable marine highway system. In the opinion of the study, subsidies would be required for operations, vessel procurement or tax incentives to create interest in the short sea shipping program.

Vessel Type

Matson had a very successful West Coast service in the 1990's, but it failed mostly due to the age of the fleet used in the service requiring rising costs for vessel operations. Also, Matson made it very clear that labor and port charges for short sea shipping played a major factor in dropping the service. As a counter to reducing vessel costs, MARAD commissioned a study in conjunction with the U.S. Department of Defense that developed a specific short sea shipping vessel.

Vessels must be matched to the service and route. Further, the costs associated with these conveyances are not trivial and scale of operations is essential to spread cost factors over a broad potential volume of freight that can be competitively carried. The speed characteristics of various vessel types will be a major factor in costs considerations, as well as service factors. Fuel efficiency will be the prime concern. While "fast ships" may be intriguing, experience shows their fuel burn rates render them non-competitive in a commercial environment. On the other side of the spectrum, barges and tug barge combinations may be the most efficient from a fuel consumption point of view, but their relatively slow speed creates competitive service concerns.

For fuel considerations, on March 26, 2010, the International Maritime Organization (IMO) officially designated waters off North American coasts as an area in which stringent international emission standards will apply to ships. The first-phase fuel sulfur standard began in 2012, the second phase began in 2015, and stringent nitrogen oxide engine standards began in 2016. The cost of the marine fuel meeting these regulations must be considered in the cost calculation. One option that some carriers serving the Washington-Alaska shipping routes are considering is Liquid Natural Gas (LNG). LNG offers an attractive option, yielding up to 30% net fuel savings over marine diesel. It also is more appealing from both environmental and air quality perspectives.

Vessels with speeds between 14 and 22 knots provide the best service profile as well as considerations for the ocean component of the voyages. However, vessel costs as well as fuel cost per mile at various speeds becomes a major planning consideration. Service must be regular and reliable and vessel schedules as advertised to potential clients must be adhered to. This means vessels must be designed to operate within these schedules and customer mandates. Vessel size and draft as well as other operational characteristics that include cranes, thrusters, and crew size will also affect the cost parameters.

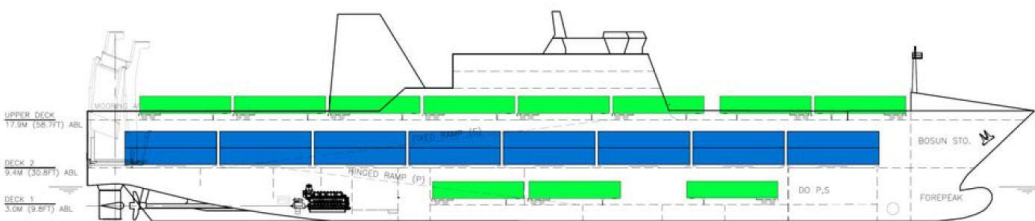
The most commercially viable marine highway vessel at this point would appear to be a modest sized (600/700 TEU) combination Lift on/Lift off and Roll on/Roll off vessel built to specifications that would include:

- Speed of 18 knots with optimal fuel efficiency utilizing environmentally friendly propellants;
- Thrusters for maneuverability;
- Unattended engine room technology;
- Gearless and hatchless for landside operational efficiencies; a
- Roll-on/Roll-off space with quartering ramps for trailers, over-sized cargoes; and
- Domestic 53 foot assets that are not Container Safety Convention rated.

Assets such as these are not available in the Jones Act inventory and would need to be constructed in U.S. shipyards. Consequently, the first and most dramatic challenge is the unavailability of Jones Act qualified vessels to actively and economically participate in this service. As Matson proved, those that are available are antiquated and have very inefficient fuel consumption and higher crew requirements when benchmarked against newer, more fuel-efficient tonnage.

Securing a suitable Jones Act fleet looms as a major dilemma for any operator and investment interests. The earliest any such tonnage could be available, assuming funding was subsidized by the U.S. government, would likely be after 2020. The costs would be in the range of \$150 million per vessel according to the study done by Herbert Engineering Corporation for MARAD in October 2011. In the interim, existing tonnage would need to be utilized and the higher fuel costs will need to be absorbed in the financial model, at least temporarily until new tonnage can be procured. This option is not considered to be viable and costs associated with short sea shipping reflect a newer vessel (as depicted in Figure 8) and less restrictive operating expenses (fuel, crew, etc.).

Figure 8 Proposed Short Sea Shipping Vessel



Terminal Operations

The key component that both studies identified was a labor concession from the ILWU that would lower the costs associated with a low volume weekly service. Challenging the existing jurisdiction of the ILWU is not a practical solution from a business or political point of view. Work rules and manning for marine highway need to be discussed with the union and the PMA in a traditional collective bargaining environment.

PMA would be the focal point for any discussions. However, it is the view of both studies that the ILWU is likely willing to view each marine highway opportunity on its own merits. Each business opportunity will be evaluated separately based on its financing and operational structure. One must assume that neither the ILWU nor the PMA will make any commitments prior to specific business cases being presented and evaluations conducted. Labor cannot be expected to make commitments that may set precedent without a business scenario that has a real chance of moving from the theoretical to the practical and implementable. In other words, it cannot be expected that the ILWU would agree to new arrangements that might lead to cost savings or productivity increases based on an ill-defined, open-ended coastwise agreement relating to marine highways.

Service must be as competitive as possible to overall time and cost when compared to truck or rail. Moreover, random (e.g., induced port calls) service offerings will not survive as the basis of any given marine highway.

Reliable, consistent, predictable service must not be in question. However, a marine highway cannot and does not operate 24/7/365 as do truck and rail. Therefore, the marine terminal will need to be aware and capable of providing levels of service that a domestic supply chain expects, but likely more than the typical international marine terminal operations (e.g., flexible gate hours and acceptance of "hot boxes" arriving after typical vessel cut-off times). The augmented operations and services associated with current services to Hawaii, Puerto Rico, and Alaska serve as models.

The high-level costs comparison for short sea shipping is summarized below in Table 31 and Table 32.

Table 31 Lewiston Short Sea Shipping Costs

Supply Chain Costs Per Container (Inland Origin)									
	Truck to Inland Terminal or T6	Rail From Inland Terminal	Inland Terminal Charges	Short Sea/ Barge Charges	T6 Charges	Transit Charges to Seattle/ Tacoma	Ocean Carrier Charges	Transship Charges (BC or NWSA)	Total Charges to Shipper
Short Sea Shipping via Vancouver (Truck)	\$ 1,100	n/a	n/a	\$ 1,620	\$ 544	n/a	\$ 1,561	\$ 300	\$ 5,125
Short Sea Shipping via Vancouver (Rail)	\$ 225	\$ 1,200	\$ 180	\$ 1,620	\$ 670	n/a	\$ 1,561	\$ 300	\$ 5,756
Barge- Rail to Seattle/Tacoma	\$ 225	n/a	\$ 180	\$ 180	\$ 261	\$ 700	\$ 1,561	\$ 310	\$ 3,417
Barge-Truck to Seattle/Tacoma	\$ 225	n/a	\$ 180	\$ 180	\$ 204	\$ 1,100	\$ 1,561	\$ 310	\$ 3,760
Rail direct to Seattle	\$ 225	\$ 1,200	\$ 180	n/a	n/a	n/a	\$ 1,561	\$ 310	\$ 3,476
Truck direct to Seattle/Tacoma	n/a	n/a	n/a	n/a	n/a	\$ 1,100	\$ 1,561	\$ 310	\$ 2,971

Table 32 Portland Origin Short Sea Shipping Costs

Supply Chain Costs Per Container (Portland Origin)									
Asia-Eastern Oregon	Dray to T6	Rail/Truck From Inland Destination	Short Sea/ Barge Charges	T6 or Rail gate charge	Transit Charges to Seattle/ Tacoma	Ocean Carrier Charges	Transship Charges (BC or NWSA)	Total Charges to Shipper	
Short Sea Shipping via Vancouver (Truck)	\$ 225	n/a	\$ 1,620	\$ 544	n/a	\$ 1,561	\$ 300	\$ 4,250	
Rail to Seattle, T6 Truck in	\$ 225	n/a	n/a	\$ 335	\$ 700	\$ 1,561	\$ 310	\$ 3,131	
Direct Rail, no T6 interface (Non-BNSF)	n/a	\$ 225	n/a	\$ 150	\$ 700	\$ 1,561	\$ 310	\$ 2,946	
Truck direct to Seattle/Tacoma	n/a	n/a	n/a	n/a	\$ 1,100	\$ 1,561	\$ 310	\$ 2,971	
Direct Vessel Call- Truck into T6	\$ 225	n/a	n/a	\$ 544	n/a	\$ 1,711	n/a	\$ 2,480	

Based on the costs to all components of the operation, and the need for a reliable service subsidized by the government and the uncertain outcome of specific short seas shipping labor discussions, Jones Act revisions, the HMT and other public policy directions, short sea shipping is not a viable alternative.

5.4 Rail Service Options

These options look at the use of the Terminal 6 intermodal yard and how the marine and rail operations can be mutually beneficial. The basis for the operations would be to receive containers either by truck or by barge from local or inland destinations and then load a train destined for either Seattle or Tacoma. Since NW Container Services operates a similar competing service, Advisian does not envision domestic containers being moved by this Terminal 6 option.

Besides the NW Container Services’ operation, the prime competition would be from trucking directly to the Seattle/Tacoma area or from Union Pacific Railroad’s Brooklyn Yard.

This option has potential particularly during start-up operations as costs and operations, such as a common gate, could be shared with other container terminal operations.

5.5 Trucking Service Options

The only option for trucking would be to set up a container drop-off facility for either rail transport to the Seattle area or California or for a direct vessel load delivery or pick-up. Having Terminal 6 operate as a trucking depot would not be viable for many reasons.

The high-level cost analysis between the rail and trucking alternatives is shown in Table 33 and Table 34.

Table 33 Lewiston Origin Rail and Truck Costs

Supply Chain Costs Per Container (Inland Origin)									
Asia-Eastern Oregon	Truck to Inland Terminal or T6	Rail From Inland Terminal	Inland Terminal Charges	Short Sea/ Barge Charges	T6 Charges	Transit Charges to Seattle/ Tacoma	Ocean Carrier Charges	Transship Charges (BC or NWSA)	Total Charges to Shipper
Rail direct to Seattle	\$ 225	\$ 1,200	\$ 180	n/a	n/a	n/a	\$ 1,561	\$ 310	\$ 3,476
Truck direct to Seattle/Tacoma	n/a	n/a	n/a	n/a	n/a	\$ 1,100	\$ 1,561	\$ 310	\$ 2,971

Table 34 Portland Origin Rail and Truck Costs

Supply Chain Costs Per Container (Portland Origin)									
Asia-Eastern Oregon	Dray to T6	Rail/Truck From Inland Destination	Short Sea/Barge Charges	T6 or Rail gate charge	Transit Charges to Seattle/Tacoma	Ocean Carrier Charges	Transshipment Charges (BC or NWSA)	Total Charges to Shipper	
Rail to Seattle, T6 Truck in	\$ 225	n/a	n/a	\$ 335	\$ 700	\$ 1,561	\$ 310	\$ 3,131	
Direct Rail, no T6 interface (Non-BNSF)	n/a	\$ 225	n/a	\$ 150	\$ 700	\$ 1,561	\$ 310	\$ 2,946	
Truck direct to Seattle/Tacoma	n/a	n/a	n/a	n/a	\$ 1,100	\$ 1,561	\$ 310	\$ 2,971	

From the above costs, direct trucking without a Terminal 6 interface, is the most cost effective for the beneficial cargo owner followed by NW Container Services or Union Pacific Railroad’s competitive services to the Seattle area. As indicated in the rail discussion, the only viable option for Terminal 6 would be rail that is combined with either direct or indirect benefits.

5.6 Equipment Pooling Options

Using the terminal to store, maintain and dispatch/receive containers, and or chassis, for use by shippers and logistics providers in the Portland-metro area is the basis for this option. Containers would include loads, empties and refrigerated containers. The Port would also be a logical location for a Customs Central Examination Station (CES) which is currently non-existent in the area.

Unless the Port wants to get into the chassis pooling business (which is not recommended), the terminal could be used by other pooling operations primarily for storage.

Maintenance and repairs of containers and chassis, while normal at other marine terminals on the West Coast, would probably not be considered for Terminal 6 due to other local competing container and chassis depots in the Portland area as well as potential disputes over labor jurisdictions.

This option is viable when used in conjunction with rail services and direct vessel calls.

5.7 Mixed-Use Options

Advisian estimates that Terminal 6 has more than sufficient capacity to handle the new Swire Shipping service and to make land available for other cargo options. The other mixed-use options that would be complementary to the Swire Shipping service and other direct vessel service would be:

- Rail services;
- Equipment pooling; and
- Bulk container operations.

A fourth opportunity would be using available acreage for project cargos, breakbulk (not bulk container), and the bulk container option.

This is the preferred option as terminal operating costs are shared by different operations, fixed costs and overhead for containers are reduced. In addition, it provides stability to the terminal without putting trust in 100% container operations.

5.8 Bulk Container Option

The bulk container option provides a unique opportunity for the Port to remain in the container handling business with a captured market regardless of the other options available.

This type of operation consists of bringing bulk material (normally mining or agriculture products) in a special container owned by the shipper. These cargoes are typically transported by railcar or truck to a marine terminal to be loaded into a bulk carrier vessel with a ship loader. The typical operations also require storage piles, domes or structures and, in many cases, dust protection on the terminal. In addition, rail unloading tracks and railcar unloading mechanisms are also required which takes up significant land.

In this operation, the container arrives by rail into the existing intermodal yard, unloaded in the standard fashion, and is stored in container stacks on Terminal 6 versus bulk material piles on the terminal.

The container is moved via normal container handling equipment to the container ship-to-shore crane and lowered into the bulk carrier vessel where the container's content is then dumped into the hold, eliminating the need for a bulk ship loader.

Typical cargoes currently being handled by this method are iron ore, coal, copper concentrate, manganese, grain, in addition to other mining and agricultural products.

Cost of transportation is reduced, storage issues of space and contamination are eliminated, and air quality emissions typically associated with bulk materials are also eliminated.

While this is a very viable option for the Port, it does not provide market access to local importer and exporters. However, in a recent DP World press release, the Port of Adelaide found itself in an identical position to the Port of Portland with their only container terminal losing traditional container handling business and seeking business opportunities.²⁵ The resulting bulk container business is now 5,000 containers per month of grain with no additional infrastructure or equipment investment.

Photo 4 Bulk Container Handling



Bulk Containers



Loading Grain



Bulk Container Spreader

5.9 Conclusions and Recommendations

The Port needs to generate profits from a combination of a mixed-use terminal, container bulk handling operation and rail service operations to subsidize the start-up of container operations with a niche carrier such as Swire Shipping.

Advisian's recommendation is to continue to market for an additional niche transpacific carrier (or hopefully an alliance carrier) to call the terminal, further investigate the bulk container option and seek out other compatible mixed-use products for Terminal 6. Based on discussions with the bulk container operations, several products within Oregon and outside of the PNW would find their way to the Port if the bulk container operation was in place. This would, at the minimum, remove the option of closing the terminal due to high fixed costs of an underutilized terminal.

In reviewing all of the high-level costs for both Lewiston origins and Portland origins, as shown in Table 35 and Table 36, and disregarding the obvious bulk container costs, a direct vessel call for regional cargoes (especially for a Portland origin) is very cost competitive to trucking or railing the container to Seattle.

Per the direction from the Port at the start of the project, the basis of the analysis is that the terminal must be self-sustaining, without any subsidies. It is both Advisian's experience, as well as the Port's, that various project specific subsidies from Federal, State and local sources are available for the economic development of the region. Section 6, looks at the costs of operations and one of the key take-aways from the ILC meetings (discussed in section 7) is where subsidies may be applied but the basis for this study does not include an analysis of subsidies.

²⁵ Port Technology International, Edition 62 May 2014

Table 35 Lewiston Origin Cost Summary

Supply Chain Costs Per Container (Inland Origin)									
Asia-Eastern Oregon	Truck to Inland Terminal or T6	Rail From Inland Terminal	Inland Terminal Charges	Short Sea/ Barge Charges	T6 Charges	Transit Charges to Seattle/ Tacoma	Ocean Carrier Charges	Transshipment Charges (BC or NWSA)	Total Charges to Shipper
Short Sea Shipping via Vancouver (Truck)	\$ 1,100	n/a	n/a	\$ 1,620	\$ 544	n/a	\$ 1,561	\$ 300	\$ 5,125
Short Sea Shipping via Vancouver (Rail)	\$ 225	\$ 1,200	\$ 180	\$ 1,620	\$ 670	n/a	\$ 1,561	\$ 300	\$ 5,756
Barge- Rail to Seattle/Tacoma	\$ 225	n/a	\$ 180	\$ 180	\$ 261	\$ 700	\$ 1,561	\$ 310	\$ 3,417
Barge-Truck to Seattle/Tacoma	\$ 225	n/a	\$ 180	\$ 180	\$ 204	\$ 1,100	\$ 1,561	\$ 310	\$ 3,760
Rail direct to Seattle	\$ 225	\$ 1,200	\$ 180	n/a	n/a	n/a	\$ 1,561	\$ 310	\$ 3,476
Truck direct to Seattle/Tacoma	n/a	n/a	n/a	n/a	n/a	\$ 1,100	\$ 1,561	\$ 310	\$ 2,971
Direct Vessel Call- Truck	\$ 1,100	n/a	n/a	n/a	\$ 544	n/a	\$ 1,711	n/a	\$ 3,355
Direct Vessel Call- Rail	\$ 225	\$ 1,200	\$ 180	n/a	\$ 438	n/a	\$ 1,711	n/a	\$ 3,754
Direct Vessel Call- Barge	\$ 225	n/a	\$ 180	\$ 180	\$ 458	n/a	\$ 1,711	n/a	\$ 2,754
Bulk Container	n/a	\$ 700	n/a	n/a	\$ 438	n/a	\$ 800	n/a	\$ 1,938

Table 36 Portland Origin Cost Summary

Supply Chain Costs Per Container (Portland Origin)									
Asia-Eastern Oregon	Dray to T6	Rail/Truck From Inland Destination	Short Sea/ Barge Charges	T6 or Rail gate charge	Transit Charges to Seattle/ Tacoma	Ocean Carrier Charges	Transshipment Charges (BC or NWSA)	Total Charges to Shipper	
Short Sea Shipping via Vancouver (Truck)	\$ 225	n/a	\$ 1,620	\$ 544	n/a	\$ 1,561	\$ 300	\$ 4,250	
Rail to Seattle, T6 Truck in	\$ 225	n/a	n/a	\$ 335	\$ 700	\$ 1,561	\$ 310	\$ 3,131	
Direct Rail, no T6 interface (Non-BNSF)	n/a	\$ 225	n/a	\$ 150	\$ 700	\$ 1,561	\$ 310	\$ 2,946	
Truck direct to Seattle/Tacoma	n/a	n/a	n/a	n/a	\$ 1,100	\$ 1,561	\$ 310	\$ 2,971	
Direct Vessel Call- Truck into T6	\$ 225	n/a	n/a	\$ 544	n/a	\$ 1,711	n/a	\$ 2,480	
Bulk Container	n/a	\$ 700	n/a	\$ 438	n/a	\$ 800	n/a	\$ 1,938	

6. Task 6 - Financial Analysis

The financial analysis addresses the question of whether and under what circumstances Terminal 6 can be operated as a dedicated container facility in a financially sustainable manner. The analysis includes a breakeven analysis that estimates the volume needed to generate a positive net income from operations.

6.1 Past Terminal 6 Financial Performance

Table 37 summarizes the financial performance of Terminal 6 from 1994 through 2010, the last year the Port operated the facility before leasing it to ICTSI.²⁶

Table 37 Financial Performance, Terminal 6 Container Line of Business

All numbers in thousands (000s)

Fiscal Year Ending	Vessel Moves ²⁷	Total Operating Revenue	Longshore Labor Expense ²⁸	Other Operating Expense	Total Operating Expense before Deprec.	Operating Inc./Loss Before Deprec.	Depreciation	Operating Inc./Loss After Deprec.
1994	150	\$30,605	\$15,590	\$12,449	\$28,038	\$2,567	\$3,150	-\$583
1995	185	\$38,203	\$21,363	\$13,256	\$34,618	\$3,585	\$3,891	-\$306
1996	174	\$35,122	\$17,362	\$12,975	\$30,337	\$4,785	\$4,677	\$108
1997	168	\$35,265	\$18,648	\$13,012	\$31,660	\$3,605	\$4,630	-\$1,026
1998	156	\$35,585	\$18,871	\$13,739	\$32,610	\$2,974	\$3,887	-\$912
1999	149	\$35,213	\$19,621	\$11,420	\$31,041	\$4,172	\$4,467	-\$296
2000	163	\$40,225	\$21,700	\$11,282	\$32,982	\$7,243	\$4,750	\$2,493
2001	156	\$40,958	\$26,342	\$11,349	\$37,691	\$3,267	\$5,077	-\$1,810

²⁶ Unless otherwise specified, the annual data in the analysis is for the Port's "fiscal year ending" (FYE). The Port's fiscal year begins July 1 and ends June 30.

²⁷ The basic volume metric used in the financial analysis is "vessel moves." A vessel move is the count of containers loaded or discharged from vessels, regardless of container size. On average, the number of twenty-foot equivalents (TEUs) per vessel move ranges between 1.7 and 1.8 in any given year at Terminal 6. The market analysis section of this study assumes 1.8 TEUs per vessel move.

²⁸ Includes payrolling and management fees.

All numbers in thousands (000s)

Fiscal Year Ending	Vessel Moves ²⁷	Total Operating Revenue	Longshore Labor Expense ²⁸	Other Operating Expense	Total Operating Expense before Deprec.	Operating Inc./Loss Before Deprec.	Depreciation	Operating Inc./Loss After Deprec.
2002	141	\$38,764	\$23,989	\$11,395	\$35,384	\$3,379	\$5,567	-\$2,187
2003	172	\$43,514	\$29,684	\$12,225	\$41,908	\$1,606	\$5,575	-\$3,969
2004	182	\$46,977	\$33,848	\$12,244	\$46,092	\$885	\$5,276	-\$4,391
2005	111	\$28,968	\$20,824	\$11,885	\$32,709	-\$3,740	\$5,140	-\$8,881
2006	100	\$25,914	\$19,059	\$13,012	\$32,072	-\$6,157	\$5,254	-\$11,411
2007	145	\$37,814	\$25,879	\$14,672	\$40,552	-\$2,737	\$5,626	-\$8,363
2008	149	\$39,443	\$28,673	\$16,451	\$45,125	-\$5,682	\$5,394	-\$11,076
2009	121	\$32,719	\$25,387	\$17,052	\$42,439	-\$9,719	\$5,770	-\$15,489
2010	98	\$25,769	\$22,429	\$14,417	\$36,846	-\$11,077	\$5,863	-\$16,940

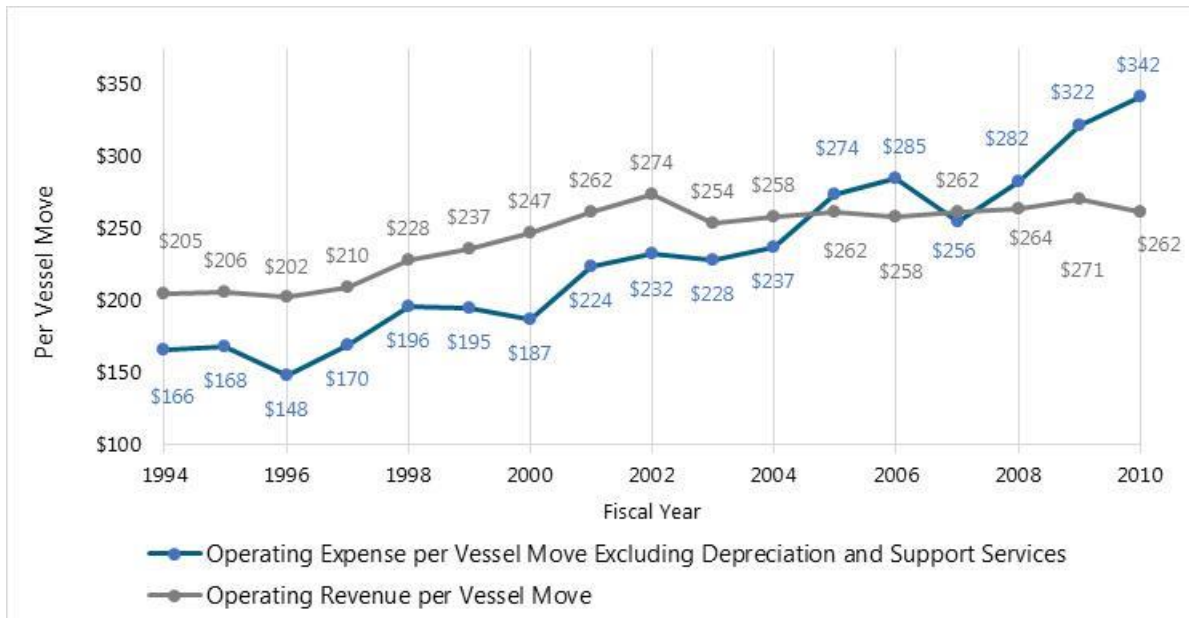
Over the 1994 to 2010 period, the terminal experienced positive net income in two years: 1996 and 2000. Port staff believes these are the only two years of profitability during the life of the terminal, which opened in 1974.

The past financial record shows that volume is a key component to the terminal's financial performance. From 1994 through 2004, the terminal averaged 163,000 vessel moves per year, but from 2005 through 2010, the average was only 121,000 vessel moves per year.

The first year the facility failed to achieve a positive operating income before depreciation was 2005 when the terminal experienced a major drop in volume with the withdrawal of transpacific services by "K" Line and Hyundai Merchant Marine. Financial losses at the terminal worsened considerably from that point forward.

The acceleration of financial losses from 2005 through 2010 is explained not only by the decline in volume, but also by the failure of pricing to keep pace with the growth in operating expenses. As illustrated by Figure 9, between 1994 and 2002, operating revenue per vessel move increased at a compound annual rate of 3.3 percent. From 2002 to 2010, the operating revenue per vessel move was flat to slightly declining. During that same period, operating expense per vessel move continued to increase.

Figure 9 Comparison of Per Box Revenue to Operating Expense



In sum, the historic financial record shows three trends contributing to increasing losses at Terminal 6: 1) declining volume; 2) flat to declining per box revenue, and 3) increasing per box operating expense.

6.2 Methodology

The consultant team, with the assistance of Port staff, developed a spreadsheet model to project terminal revenue and expense over a range of volumes. The model results are for a single hypothetical year, in current 2017 dollars.

Basic Assumptions. The analysis makes certain basic assumptions that are worth noting at the start:

- Terminal productivity levels are at 2006–2009 levels.
- Pricing to carriers is at 2006–2009 levels, adjusted to current dollars.
- The terminal operating model is “semi-operate,” i.e., the Port hires a contractor to payroll the longshore and to provide terminal management services. This is the operating model used by the Port prior to leasing the terminal to ICTSI.
- Depreciation and corporate support services expenses are capped at certain levels in the model.

Port of Portland Terminal 6 Financials. The Port provided a database of financial information for its Terminal 6 container line of business for the fiscal years ending 2006, 2007, 2008, and 2009. This database includes a detailed breakdown of operating expenses and revenues for Terminal 6 container operations.

Adjustment to Current Dollars. Most of the financial information provided by the Port was for the 2006 to 2009 period. This information is adjusted in the model for inflation and the growth in wages and benefits to bring it to current dollars. The process for adjusting to current dollars varies by the category of expense and revenue. These processes are described in more detail below.

Operations/Productivity Data. Another key set of data used by the analysis is weekly operational data showing longshore hours and terminal activity (expressed in number of moves) provided by the Port. This dataset covers a 132-month period beginning in 2006 and ending in 2009. These data are summarized in three major categories: vessel, gearlocker, and gate/yard operations.²⁹

Revenue and Expense Tables. For each revenue and expense type in the model, a table of values was developed showing values in 10,000 vessels move increments, up to 300,000 vessel moves. The model links to each of these tables to provide a summary table of revenues and expenses for any vessel move volume that is input.

6.3 Scenarios

Two scenarios were developed with input from the Port and analyzed: the “Dedicated” Terminal, and the “Mixed-Use” Terminal.

Dedicated Terminal Scenario. This scenario assumes the entire 192-acre terminal footprint is used to service the Container Vessel Operation (gate, yard, terminal administration, etc.).

Mixed-Use Terminal Scenario. This scenario assumes that two other operations – Intermodal and Breakbulk – take place on the terminal in addition to the Container Vessel Operation.

- The **Intermodal Operation** assumes that a portion of 52-acre intermodal yard is used to load and discharge intermodal trains moving international containers between Terminal 6 and Seattle/Tacoma. These intermodal containers would enter and exit the same truck gate used by the Container Vessel Operation.
- The **Breakbulk Operation** assumes Berth 603 and a portion of Berth 604 – 30 to 50 acres in total – is used to handle cargo loaded and discharged from breakbulk vessels.
- Under the Mixed-Use Terminal Scenario, the **Container Vessel Operation** uses approximately 50 to 60 percent of the Terminal 6 footprint.

Under the Mixed-Use Terminal Scenario, certain expenses are shared among the different operations, thereby reducing the per unit cost of the Container Vessel Operation. For example, there are certain fixed costs associated with the operation of the gate that can be shared between the Container Vessel operation and other operations. Other expense categories shared in the Mixed-Use Terminal Scenario include security, terminal administration, depreciation, and support services. The percent allocation of selected expenses to the container vessel operation in the Mixed-Use scenario is summarized in Table 38.

²⁹ Data were also provided for rail and barge operations and incorporated into the analysis.

Table 38 Mixed-Use - % of Expense Allocated to Container Vessel Operations

Expense Item	Annual Vessel Moves						
	10,000	50,000	100,000	150,000	200,000	250,000	300,000
Longshore Labor - Gearlocker	65%	71%	78%	85%	90%	95%	100%
Longshore Labor - Gate	65%	71%	78%	85%	90%	95%	100%
Terminal	65%	71%	78%	85%	90%	95%	100%
Security	65%	71%	78%	85%	90%	95%	100%
Depreciation	75%	79%	85%	90%	93%	97%	100%
Support Services	75%	79%	85%	90%	93%	97%	100%
Berth Dredging	65%	71%	78%	85%	90%	95%	100%
Stormwater Fees	54%	61%	71%	80%	80%	80%	80%
Insurance	65%	71%	78%	85%	90%	95%	100%
Facility Maintenance	75%	79%	85%	90%	93%	97%	100%

Generally, the expense allocation shifts back to the Container Vessel Operation at higher vessel moves as that operation displaces the Breakbulk Operation.

The Mixed-Use Terminal Scenario included \$2.25 million of non-container vessel (breakbulk, intermodal rail) revenue.

Caveat Regarding the Mix-Use Terminal Scenario. This study makes no assessment of the commercial or operational viability of Intermodal or Breakbulk operations at Terminal 6. While the scenario offered financial benefits to the Container Vessel Operation, these benefits may not be available to the Port due to factors not evaluated by this study.

6.4 Operating Revenues

Throughput. Throughput is fee paid by container carriers for handling their containers. The charge covers one move on or off the vessel, plus one move in or out of the terminal (by truck, rail, or barge). The fee is assessed on each vessel move. The charge is typically adjusted annually according to changes in PMA/ILWU coastwide wage rates and assessments.

Wharfage. Wharfage is the fee paid by container carriers for the use of the terminal. The fee is assessed on each vessel move and is typically adjusted annually per changes in the consumer price index.

Calculation of Throughput and Wharfage. To establish current Throughput and Wharfage rates for the model, the consultant team analyzed past revenues per vessel move and then adjusted those rates to current dollars using the above methodologies.

The Port provided annual revenues for Throughput and Wharfage over the 2006-09 period which were then used to calculate the per vessel move rate for each. For example, in FY 2009, the combined Throughput and Wharfage revenue per vessel move was \$233.16 (see Table 39).

Table 39 Throughput and Wharfage Revenue Per Vessel Move

	2005/06	2006/07	2007/08	2008/09
Throughput	\$166.95	\$178.56	\$196.69	\$204.54
Wharfage	\$48.87	\$37.60	\$27.84	\$28.62
Total	\$215.83	\$216.16	\$224.53	\$233.16

The next step in the Throughput/Wharfage calculation was to increase the per vessel move rates to current 2017 dollars. For Wharfage, this was done by applying the change in the consumer price index. For Throughput, the adjustment was based according to the change in the combined PMA/ILWU base hourly wage rate and assessment. Table 40 shows the inputs for this calculation. For example, the combined base hourly rate and assessment in 2005/06 was \$45.39. In 2017/18, the same combined rate is \$74.99, which is 65 percent higher. Thus, the adjustment factor to bring 2005/06 to 2017/18 is **1.65213** (see Table 40).

Table 40 Calculation of Inflation Factor

	2005/06	2006/07	2007/08	2008/09	2017/18
Base Hourly Wage	\$29.68	\$30.18	\$30.68	\$31.18	\$40.93
Assessment	\$15.71	\$15.96	\$17.72	\$19.99	\$34.06
Total	\$45.39	\$46.14	\$48.40	\$51.17	\$74.99
Inflation Factor – Adjust to 2017/18	1.65213	1.62527	1.54938	1.46551	

The inflation factors were applied to each of the four years and then averaged over those years. The result is a projected combined Throughput/Wharfage rate of **\$335.27** per vessel move in current dollars. In the model, Throughput and Wharfage revenue is calculated by multiplying vessel moves by this rate (see Table 41).

Table 41 Throughput and Wharfage per Vessel Move in 2017/18 \$

	2005/06	2006/07	2007/08	2008/09	4-yr Avg.
Throughput	\$275.83	\$290.20	\$304.74	\$299.76	\$292.63

Wharfage	\$60.59	\$45.11	\$31.65	\$33.21	\$42.64
Total	\$336.42	\$335.31	\$336.39	\$332.97	\$335.27

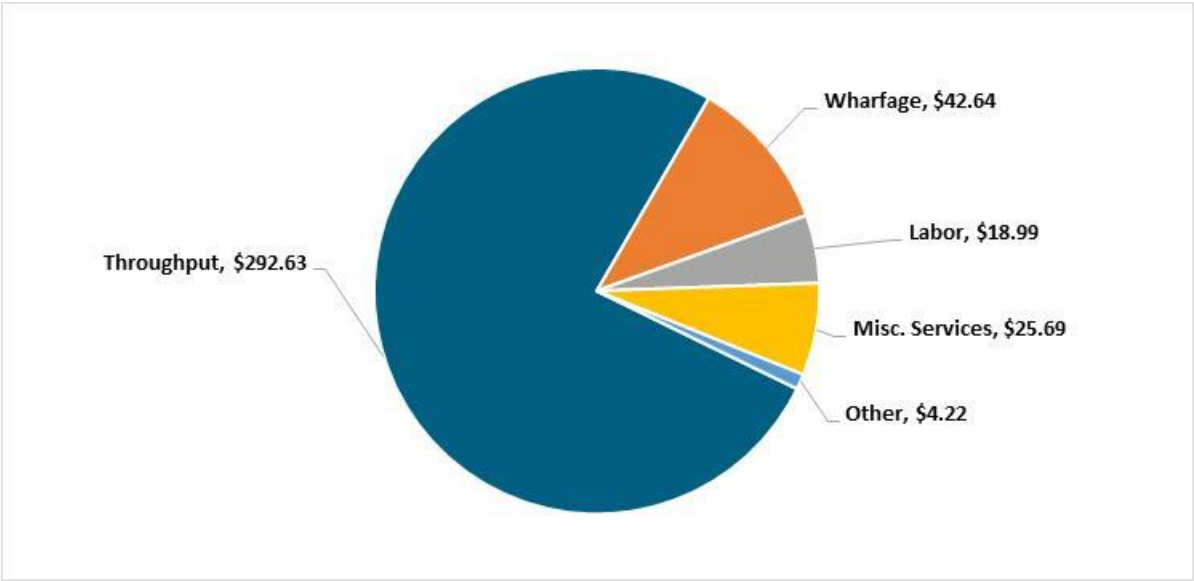
Miscellaneous Services. Miscellaneous Services are charges to carriers for services not covered by the Throughput charge, such as security fees, handling of refrigerated cargoes, and “extra” moves made at the request of the carrier. The relationship between Miscellaneous Services revenue and the combined Throughput/Wharfage charge has been relatively constant over time, averaging about 8 percent of Throughput/Wharfage revenue. This percentage is used to calculate Miscellaneous Services revenue in the model.

Labor. Labor revenue is primarily derived from charges to ocean carriers for container crane gangs on standby (typically awaiting vessel arrival). The relationship between Labor revenue and the combined Throughput/Wharfage charge has been constant over time, averaging about 6 percent of Throughput/Wharfage revenue during the 2006-09 period. This percentage is used to calculate Labor revenue in the model.

Other. The terminal received various other minor revenue from items like equipment rents and fuel sales. This Other revenue accounts for about 1 percent of the terminals revenues in a typical year; this percentage is used to calculate Other revenues in the model.

Revenue Summary. Per the above methodology, the total terminal revenue assumed by the model is **\$384** per vessel move. Of that, the combine Throughput and Wharfage fee, charged to carriers per vessel move, is **\$335** (see Figure 10). The remaining revenue – Labor, Miscellaneous Services, and Other – accounts for \$49 per vessel move.

Figure 10 Revenue per Vessel Move - Model Assumption



6.5 Operating Expenses

Longshore Labor. In the model, Longshore Labor expense is estimated in the model by multiplying two factors – a longshore hourly cost by the number of longshore hours per vessel move – and then multiplying that product by a third factor – the number of annual vessel moves. The longshore hourly cost was estimated by taking the historic longshore hourly cost in 2008 for Terminal 6, and then adjusting that number to current dollars using the same PMA/ILWU inflation adjustment factor used to adjust Throughput revenues. This is done for five categories of longshore hourly costs: vessel, gate-yard, gearlocker, barge, and rail. Hourly longshore labor costs exclude any payroll or management fees charged by the MTC, the Port’s labor contractor at the time. The hourly longshore costs used in the model reflect a blended rate that accounts for overtime and shift differentials as experienced in 2008.

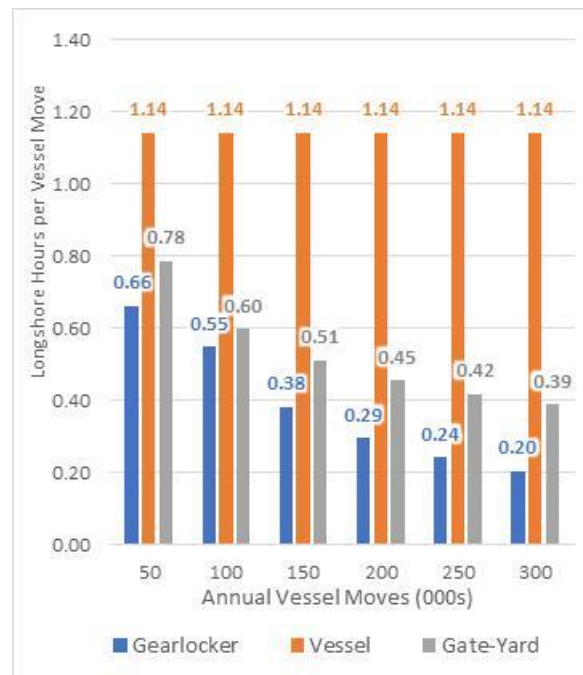
Longshore productivity rates, expressed in longshore hours per vessel move, was calculated using the 132-week set of operational data (2006-2009) provided by the Port. This calculation was performed for the five categories of longshore labor cost: vessel, gate-yard, gearlocker, barge, and rail. Formulas are used in the model to simulate how, in certain categories of labor cost, productivity rates improve with volume increases.

As illustrated by Figure 11, productivity improves with volume increases for the gearlocker and gate-yard. By comparison, vessel productivity remained essentially constant regardless of weekly volume. Figure 12 shows the productivity factors used by the model.

Figure 11 Longshore Productivity



Figure 12 Longshore Productivity Factors

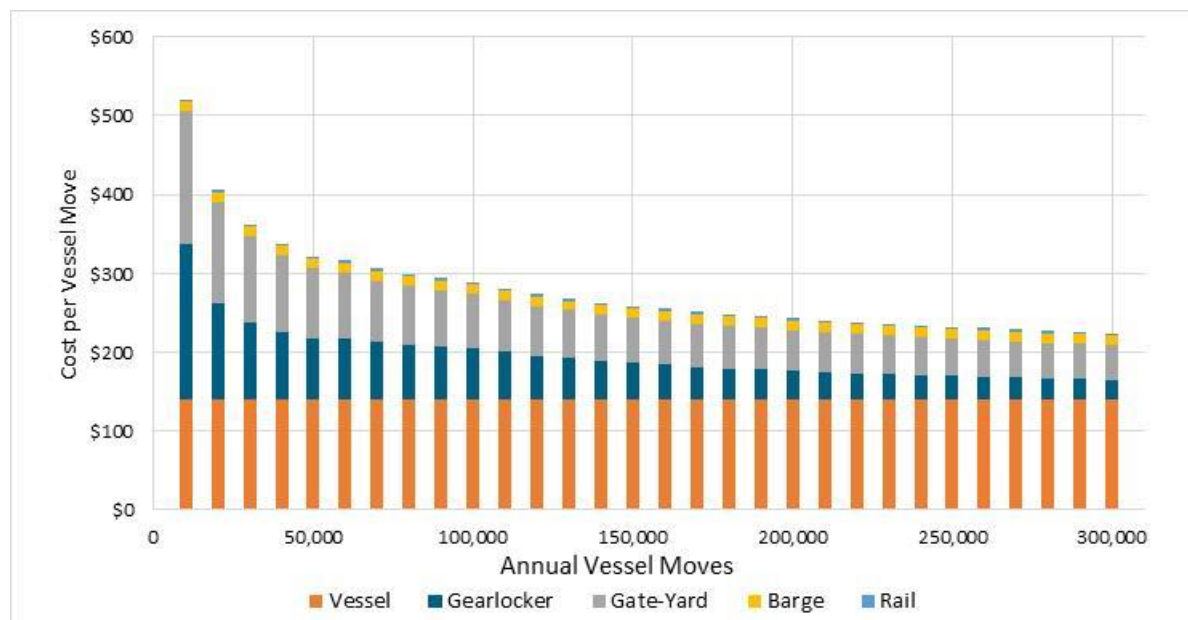


Most of the Longshore Labor costs – about 95 percent – occurs in the gearlocker, gate-yard, and vessel categories, with the remainder in barge and rail operations. To estimate longshore labor expense for barge and rail operations, the following was assumed:

- The number of barge moves equaled 15 percent of the assumed number of vessel moves.
- The number of rail moves equaled 5 percent of the assumed number of vessel moves.

The improved efficiencies with scale can be seen in Figure 13, which shows the resulting longshore labor cost per vessel move from 0 to 300,000 annual vessel moves.

Figure 13 Longshore Labor Cost per Vessel Move



Terminal 6 Productivity versus Other Terminals. Terminal productivity is assumed to be the same as what the Port experienced during the 2006 – 2009 period, when the Port was operating the terminal under a management contract with MTC. The Port believes the terminal’s productivity was competitive with other West Coast terminals during that period. Anecdotal evidence confirms that the Port’s crane productivity, which averaged nearly 26 gross moves per hour during that period, was comparable to crane productivity rates experienced at other West Coast at the time.³⁰ It is likely, however, that Terminal 6 productivity in the gearlocker and gate-yard was slightly below the West Coast average as those terminal operations have a fixed cost component and most West Coast terminals operated at volumes greater than those experienced at Terminal 6 in the 2006 – 2009 period.

Terminal Administration. Under the Port “semi-operate” model, the labor contractor provides most of the terminal management staff such as terminal manager, vessel superintendents, gearlocker manager, gate manager, etc. This contract expense is a percentage of the longshore labor expense and is based on a confidential rate. Terminal administration expense would also include marketing, information technology, and oversight staff provided by the Port. The total number of positions increase with volume. At 100,000 vessel

³⁰ Gross crane moves per hour exclude time delays caused by the vessel, e.g., standby while awaiting vessel arrival.

moves, the Dedicated Terminal Scenario assumes 13.5 full time equivalents (FTEs), of which 4.5 are Port employees.

Electrical Maintenance. Terminal 6 electrical maintenance is provided by Port employees. Most of the electrical maintenance expense is related to monitoring and work on ship-to-shore cranes during vessel operations. Port electricians also perform maintenance work on terminal buildings, gate, yard, etc. At 100,000 vessel moves, the Dedicated Terminal Scenario assumes 6.4 electrician FTEs. The analysis assumes that the electrical maintenance of refrigerated containers is performed by the longshore workforce.

Facility Maintenance. Facility maintenance (e.g., plumbing, painting, carpentry, etc.) is provided by Port employees. Historic data shows that facility maintenance expense is a relatively fixed expense. The Dedicated Terminal Scenario assumes \$821,000 at no vessel moves, \$944,000 at 150,000 vessel moves, and \$1,086,000 at 300,000 vessel moves.

Security. The Port provides security services to the terminal using Port employees (ILWU Local 28). The model assumes security expenses based on historic staffing levels and spending. Staffing is reduced from normal levels for volumes under 100,000 vessel moves to account for fewer days that the gate is opened. The historic expenses are updated to current dollars using an inflation adjustment. The Dedicated Terminal Scenario assumes \$1,000,000 at no vessel moves, \$1,593,000 at 150,000 vessel moves, and \$1,750,000 at 300,000 vessel moves.

Utilities. The two largest components of the utility expense category are stormwater management fees and electricity. Stormwater management is a fixed expense, with annual fees currently totaling \$1 million for the 192-acre terminal. Electricity has a strong relationship with the use of the ship-to-shore cranes and increases proportionally with volume.

Fuel and Equipment Rent. The model projects fuel consumption and expense base on historic terminal fuel usage data. At 100,000 vessel moves, it is assumed that 1.3 gallons of diesel and 0.42 gallons of gasoline are consumed for each vessel move. The model assumes improved consumption efficiency as volumes increase.

Materials and Supplies. Expenses for materials and supplies are closely associated to volume and increase proportionally with changes to vessel volume.

Contract Services. This expense category includes numerous contracts for services, including advertising, specialized equipment repair, janitorial services, spill response, software services, etc. These expenses remain at a constant \$1,070,000 million at all vessel volumes.

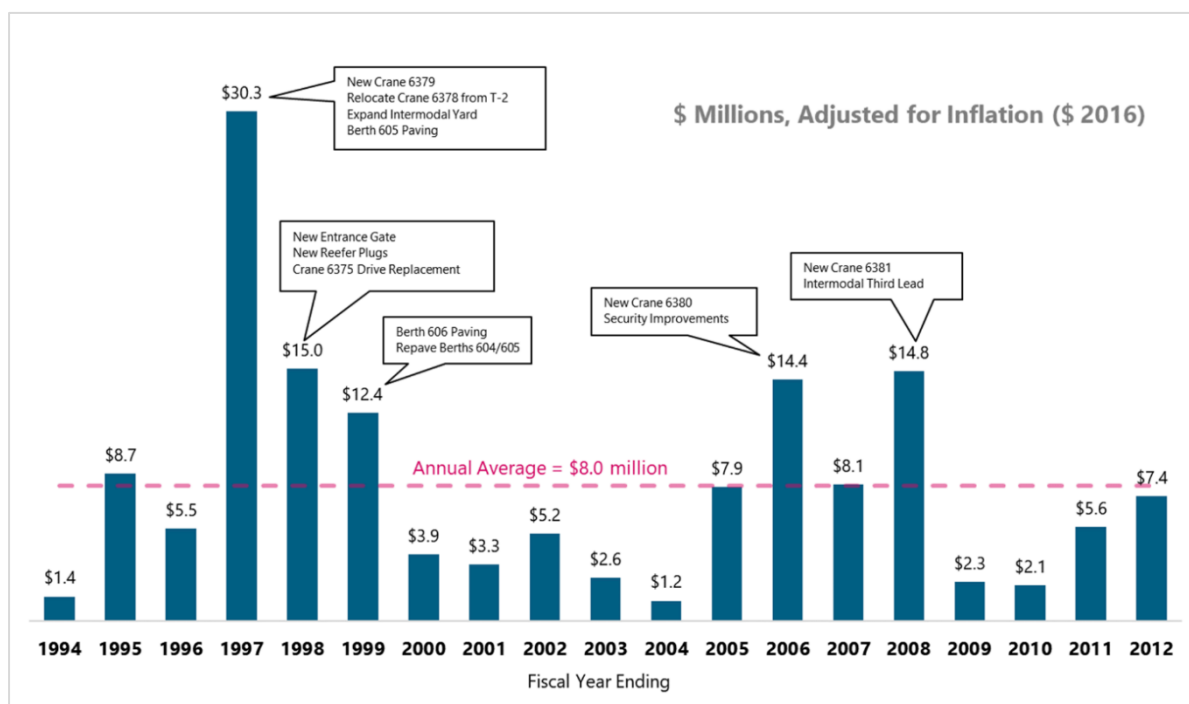
Berth Dredging. The terminal's berths are dredged approximately every three years to maintain depth. The Port currently budgets \$3,060,000 for each dredging event, which averages to \$1,020,000 per year.

Support Services. The expense category covers internal costs to support the terminal operation that are not included directly in the terminal cost center. Functions in this category include executive management, legal support, human resources, accounting (e.g., billing, accounts payable, financial analysis), engineering, public relations, environmental, etc. During the 2006-2009 period, the Port allocated \$5.5 million of support services expense on average each year to the Terminal 6 container cost center. This analysis reduces this amount to \$3 million per year to bring that expense in line with expenses that a private terminal operator might allocate to terminal operation of this size and type.

Depreciation. Currently, the Port’s accounting records show slightly less than \$5 million of annual depreciation for the Terminal 6 facility. The model assumes a range of annual depreciation depending on annual volumes, starting at \$4 million at 10,000 annual vessel moves and increasing to \$6 million at 150,000 annual vessel moves and above. The escalation of depreciation with volume assumes that more capital expenditure will be needed to maintain and restore the terminal as volumes increase.

Generally, depreciation is used as a proxy for the need for capital expenditures. As depicted in Figure 14, cash investment in the container terminal has averaged \$8 million per year in 2016 dollars. The depreciation assumptions used in the model are considerably lower than this on the assumption that major capital expenditures to upgrade or expand the terminal will not be needed in the foreseeable future.

Figure 14 Cash Investments in the Terminal 6 Container Business Line



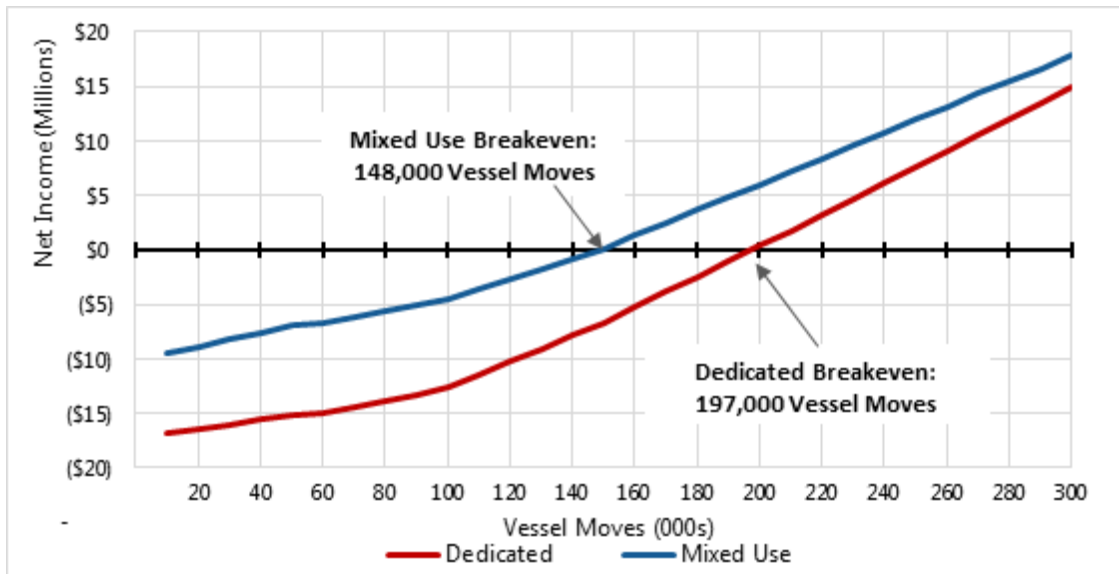
Other Expenses. The model includes assumptions for various other expenses, including license fees for the terminal operating system, insurance, and other miscellaneous items.

6.6 Model Results

Output tables from the model (revenues, expenses, and net income) are shown in Table 42 (Dedicated Terminal Scenario) and Table 43 (Mixed-Used Terminal Scenario), which can be found at the end of this section.

The analysis indicates a breakeven volume of 197,000 vessel moves in the Dedicated Terminal Scenario (Figure 15). For the Mixed-Use Terminal Scenario, the analysis indicates a breakeven volume of 148,000 vessel moves.

Figure 15 Breakeven Chart



The analysis projects smaller losses than actually experienced by the Port. For example, in 2010 the terminal had 98,000 vessel moves and a \$16.9 million loss. By comparison, at 100,000 vessel moves, the model indicates a loss of \$12.6 million under the Dedicated Terminal Scenario, and a loss of \$6.7 million in the Mixed-Use Terminal Scenario. The lower losses are primarily due to the caps placed on Depreciation and support services expenses in the model.

Figure 16 compares the breakeven volumes under the two model scenarios with past terminal volumes. Terminal 6 has never achieved the Dedicated Terminal Scenario breakeven volume of 197,000 vessel moves. The Mixed-Use Terminal Scenario of 148,000 vessel moves has been achieved 11 times in the past.

Figure 16 Breakeven Volume vs. Past Volume

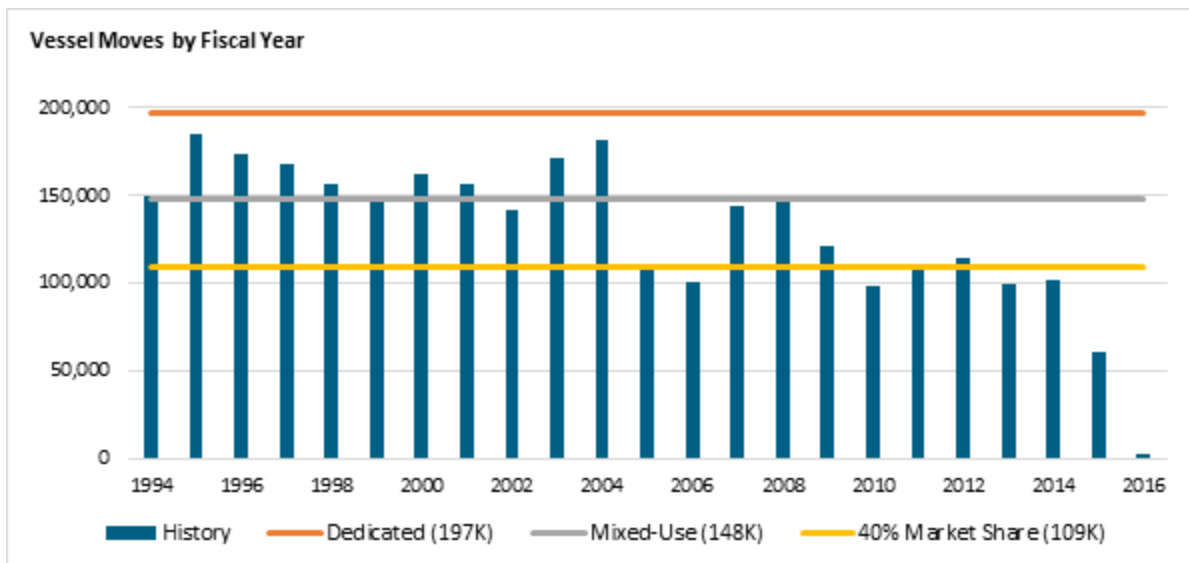
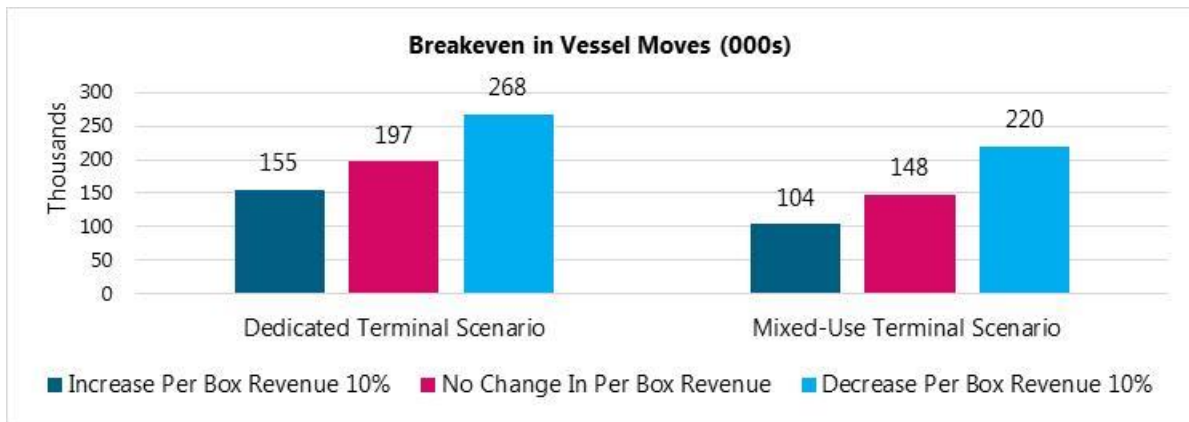


Figure 16 includes a line at 109,000 vessel moves, which equates to roughly 40 percent of the local market. This is approximately the market share for the terminal over its last 10 years of full operation. By comparison, the market share at the Dedicated Terminal Scenario breakeven volume is approximately 72 percent, and at the Mixed-Use Terminal Scenario breakeven volume it is approximately 54 percent.

6.7 Sensitivity Analysis

Per Box Revenue. The analysis found that the breakeven point is very sensitive to changes to the per box revenue charged (a proxy for price). The resulting change in breakeven points cause by a 10 percent increase and 10 percent decrease in the base \$335 throughput/wharfage rate is shown in Figure 17.

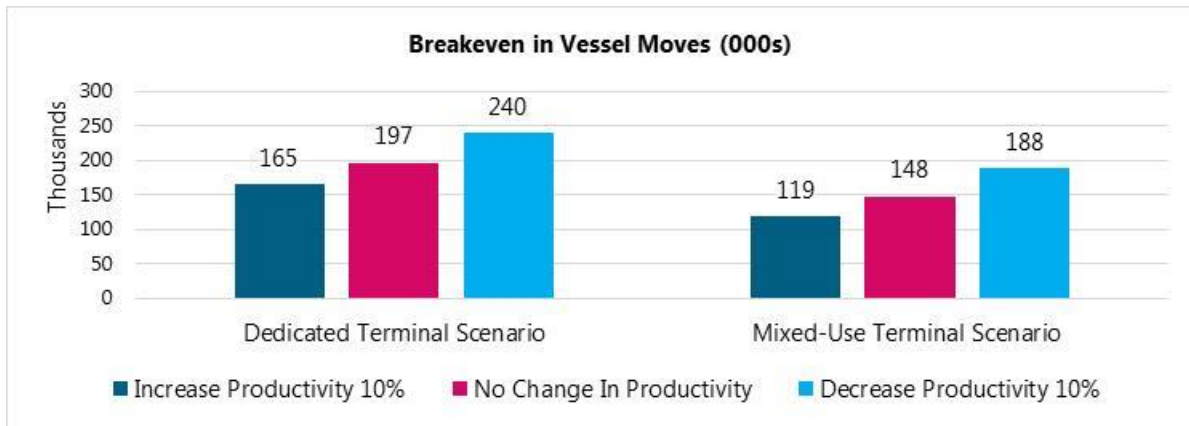
Figure 17 Per Box Revenue Sensitivity



The base charge of \$335 per vessel move assumes the Port could have increased rates to match increases in expense inflation over the eight-year period since the Port last operated the facility. However, based on the Port's inability to increase per box charge over the 2003-2010 period, a 10 percent decrease over the base may be more likely than a 10 percent increase.

Productivity. The analysis found that the breakeven points are also sensitive to changes in productivity (Figure 18).

Figure 18 Productivity Sensitivity



It is difficult to assess whether productivity could be increased 10 percent over 2006-2009 levels. The Port believes that productivity during that period was generally comparable to West Coast averages. A 10 percent increase in crane productivity would equate to nearly 29 crane moves per hour (gross). Productivity can be affected by many factors, including the number of vessel moves per call, the way the vessel is stowed, the timing of vessel arrivals, the experience of crane operators, the efficiency of yard operations, etc. When these factors were positively aligned, it is possible to achieve levels of crane productivity considerably higher than average during single shifts and single vessel calls. However, the Port might find it difficult to sustain appreciably higher-than-average levels of productivity over long periods of time.

6.8 Summary of Task 6 Findings

The financial analysis indicates that terminal volume at or near a historically high level is needed for the Terminal 6 container operation to breakeven financially. Importantly, the Port also needs to be able to set and maintain prices at levels commensurate with expenses and expense growth. In the past, the Port has been unable to sustain volumes and prices at levels needed to avoid financial losses. Productivity is also a key factor and the terminal needs to, at minimum, approach or meet coastwide productivity standards to be financially sustainable. The following points expand on these findings:

- **Volume and Scale are the Keys to Profitability.** Container terminal operations require high levels of capital investment and carry large fixed costs. It is unlikely, perhaps impossible, to operate container terminals with low volumes, especially as a stand-alone, dedicated operation.
- **Prices must be set at “Sustainable” Levels and Match Expense Growth.** While low volume is a key factor in financial performance at the terminal, the data and analysis indicate that pricing is also a key factor. Per box revenues failed to keep pace with expenses during the latter years of the Port’s operation of the terminal, exacerbating financial losses.

- **Productivity must Meet or Exceed Coastwide Standards.** Along with volume and pricing, productivity is a key factor in the profitability of terminal operations. Terminal 6 productivity was at or near West Coast standards from 2006 through 2010, at least in terms of crane productivity. It is likely that terminal productivity in the gearlocker and gate-yard areas of the terminal were below West Coast average due to relatively low volumes. Gearlocker and gate-yard activity have a fixed cost component that makes efficiency problematic at low volumes. The evidence strongly suggests, however, that the financial losses experienced at the terminal during the period of Port operations (2010 and before) were primarily caused by low volume and pricing rather than low productivity.
- **“Mixed Use” of the Terminal will Improve Financial Performance.** Given that the Port is unlikely to achieve breakeven volumes at the terminal in the near term, the use of under-utilized portions of the terminal for non-container vessel operations (e.g., Breakbulk and Intermodal) offer an opportunity to reduce losses related to the general operation of the facility. As indicated by the analysis, mixed-use operations could potentially lower the breakeven point for Container Vessel operations through the re-allocation of certain shared terminal costs.

The study and financial analysis assumes that the primary role of Terminal 6 remains Container Vessel operations, even in the Mixed-Use Scenario. It might be possible that the facility could more quickly achieve a stable financial footing under a scenario wherein container vessel shipping took a more secondary role. This scenario was not included in this analysis, however.

Table 42 Dedicated Terminal Scenario Model Results

Annual Vessel Moves	50,000	100,000	150,000	200,000	250,000
Revenue					
Throughput	\$14,631,641	\$29,263,283	\$43,894,924	\$58,526,566	\$73,158,207
Wharfage	\$2,132,000	\$4,264,000	\$6,396,000	\$8,528,000	\$10,660,000
Labor Revenue	\$949,735	\$1,899,469	\$2,849,204	\$3,798,938	\$4,748,673
Misc. Service Revenue	\$1,284,640	\$2,569,280	\$3,853,920	\$5,138,560	\$6,423,200
Other Revenue	\$211,113	\$422,225	\$633,338	\$844,451	\$1,055,563
Total Revenue	\$19,209,129	\$38,418,257	\$57,627,386	\$76,836,514	\$96,045,643
Expenses					
Port Labor					
Terminal Staff	\$394,875	\$607,500	\$607,500	\$607,500	\$607,500
Electricians	\$633,671	\$1,020,564	\$1,392,255	\$1,757,113	\$2,118,316
Security	\$1,269,800	\$1,539,600	\$1,592,200	\$1,644,800	\$1,697,400
Facility Maintenance	\$861,913	\$902,957	\$944,000	\$991,200	\$1,038,400
Other Port Labor	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
Total Port Labor	\$3,360,259	\$4,270,620	\$4,735,955	\$5,200,613	\$5,661,616
Longshore Labor					
Vessel	\$7,074,864	\$14,149,728	\$21,224,592	\$28,299,456	\$35,374,320

Annual Vessel Moves	50,000	100,000	150,000	200,000	250,000
Gearlocker	\$3,874,447	\$6,498,307	\$6,772,140	\$6,973,481	\$7,133,814
Gate and Yard	\$4,458,724	\$6,788,322	\$8,681,447	\$10,337,156	\$11,836,087
Barge	\$604,340	\$1,208,680	\$1,813,020	\$2,417,360	\$3,021,700
Rail	\$157,040	\$302,542	\$443,984	\$582,854	\$719,841
Total Longshore Labor	\$16,169,415	\$28,947,579	\$38,935,183	\$48,610,307	\$58,085,762
Mgmt. Fee	\$1,390,570	\$2,489,492	\$3,348,426	\$4,180,486	\$4,995,375
Total Longshore Labor	\$17,559,984	\$31,437,071	\$42,283,609	\$52,790,793	\$63,081,137
Total Labor Expenses	\$20,920,243	\$35,707,692	\$47,019,564	\$57,991,406	\$68,742,753
Materials and Supplies					
Contract Professional Services	\$1,070,000	\$1,070,000	\$1,070,000	\$1,070,000	\$1,070,000
Berth Dredging	\$1,020,000	\$1,020,000	\$1,020,000	\$1,020,000	\$1,020,000
Materials and Supplies	\$625,000	\$1,250,000	\$1,875,000	\$2,500,000	\$3,125,000
Utilities	\$463,684	\$776,368	\$1,089,052	\$1,401,737	\$1,714,421
Stormwater Fees	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000
Equipment Rents and Fuel	\$329,400	\$628,579	\$794,487	\$950,061	\$1,097,734
Insurance	\$450,000	\$450,000	\$450,000	\$450,000	\$450,000
Travel Expenses	\$420,000	\$420,000	\$420,000	\$420,000	\$420,000
Software Expense	\$300,000	\$300,000	\$450,000	\$600,000	\$750,000
Misc. Expenses	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
Total Materials and Services	\$5,728,084	\$6,964,947	\$8,218,540	\$9,461,797	\$10,697,155
Total Labor and Materials	\$26,648,327	\$42,672,639	\$55,238,104	\$67,453,204	\$79,439,908
Depreciation	\$4,666,667	\$5,333,333	\$6,000,000	\$6,000,000	\$6,000,000
Support Services	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000
Total Operating Expenses	\$34,314,994	\$51,005,972	\$64,238,104	\$76,453,204	\$88,439,908
Net Income/(Loss)	(\$15,105,865)	(\$12,587,715)	(\$6,610,718)	\$383,310	\$7,605,735

Table 43 Mixed-Used Terminal Scenario Model Results

Annual Vessel Moves	50,000	100,000	150,000	200,000	250,000
Revenue					
Throughput	\$14,631,641	\$29,263,283	\$43,894,924	\$58,526,566	\$73,158,207
Wharfage	\$2,132,000	\$4,264,000	\$6,396,000	\$8,528,000	\$10,660,000
Labor Revenue	\$949,735	\$1,899,469	\$2,849,204	\$3,798,938	\$4,748,673

Annual Vessel Moves	50,000	100,000	150,000	200,000	250,000
Misc. Service Revenue	\$1,284,640	\$2,569,280	\$3,853,920	\$5,138,560	\$6,423,200
Other Revenue	\$211,113	\$422,225	\$633,338	\$844,451	\$1,055,563
Intermodal Net Income	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000
Breakbulk Net Income	\$1,250,000	\$1,250,000	\$1,250,000	\$1,250,000	\$1,250,000
Total Revenue	\$21,459,129	\$40,668,257	\$59,877,386	\$79,086,514	\$98,295,643

Expenses

Port Labor

<i>Terminal Staff</i>	\$279,233	\$472,982	\$516,375	\$546,750	\$577,125
Electricians	\$633,671	\$1,020,564	\$1,392,255	\$1,757,113	\$2,118,316
<i>Security</i>	\$897,930	\$1,198,689	\$1,353,370	\$1,480,320	\$1,612,530
<i>Facility Maintenance</i>	\$683,374	\$764,288	\$849,600	\$925,120	\$1,003,787
Other Port Labor	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
Total Port Labor	\$2,694,208	\$3,656,523	\$4,311,600	\$4,909,303	\$5,511,757

Longshore Labor

Vessel	\$7,074,864	\$14,149,728	\$21,224,592	\$28,299,456	\$35,374,320
<i>Gearlocker</i>	\$2,739,787	\$5,059,396	\$5,756,319	\$6,276,133	\$6,777,123
<i>Gate and Yard</i>	\$3,152,955	\$5,285,194	\$7,379,230	\$9,303,440	\$11,244,282
Barge	\$604,340	\$1,208,680	\$1,813,020	\$2,417,360	\$3,021,700
Rail	\$157,040	\$302,542	\$443,984	\$582,854	\$719,841
Total Longshore Labor	\$13,728,986	\$26,005,540	\$36,617,145	\$46,879,243	\$57,137,267
Mgmt. Fee	\$1,180,693	\$2,236,476	\$3,149,074	\$4,031,615	\$4,913,805
Total Longshore Labor	\$14,909,679	\$28,242,016	\$39,766,220	\$50,910,858	\$62,051,072
Total Labor Expenses	\$17,603,886	\$31,898,539	\$44,077,820	\$55,820,161	\$67,562,829

Materials and Supplies

<i>Contract Professional Services</i>	\$963,000	\$963,000	\$963,000	\$963,000	\$963,000
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Annual Vessel Moves	50,000	100,000	150,000	200,000	250,000
<i>Berth Dredging</i>	<i>\$721,286</i>	<i>\$794,143</i>	<i>\$867,000</i>	<i>\$918,000</i>	<i>\$969,000</i>
Materials and Supplies	\$625,000	\$1,250,000	\$1,875,000	\$2,500,000	\$3,125,000
<i>Utilities</i>	<i>\$440,500</i>	<i>\$737,550</i>	<i>\$1,034,600</i>	<i>\$1,331,650</i>	<i>\$1,628,700</i>
<i>Stormwater Fees</i>	<i>\$614,286</i>	<i>\$707,143</i>	<i>\$800,000</i>	<i>\$800,000</i>	<i>\$800,000</i>
Equipment Rents and Fuel	\$329,400	\$628,579	\$794,487	\$950,061	\$1,097,734
<i>Insurance</i>	<i>\$318,214</i>	<i>\$350,357</i>	<i>\$382,500</i>	<i>\$405,000</i>	<i>\$427,500</i>
Travel Expenses	\$419,000	\$419,000	\$419,000	\$419,000	\$419,000
<i>Software Expense</i>	<i>\$240,000</i>	<i>\$240,000</i>	<i>\$360,000</i>	<i>\$480,000</i>	<i>\$600,000</i>
Misc. Expenses	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
Total Materials and Services	\$4,720,686	\$6,139,772	\$7,545,587	\$8,816,711	\$10,079,934
Total Labor and Materials	\$22,324,572	\$38,038,311	\$51,623,407	\$64,636,872	\$77,642,763
<i>Depreciation</i>	<i>\$3,700,000</i>	<i>\$4,514,286</i>	<i>\$5,400,000</i>	<i>\$5,600,000</i>	<i>\$5,800,000</i>
<i>Support Services</i>	<i>\$2,378,571</i>	<i>\$2,539,286</i>	<i>\$2,700,000</i>	<i>\$2,800,000</i>	<i>\$2,900,000</i>
Total Operating Expenses	\$28,403,144	\$45,091,882	\$59,723,407	\$73,036,872	\$86,342,763
Net Income/(Loss)	(\$6,944,015)	(\$4,423,625)	\$153,979	\$6,049,642	\$11,952,880

Blue, italicized lines indicate items adjusted by mixed-use Terminal Scenario allocations.

7. Task 7 - Stakeholder Team Engagement

The Port established a 23-member Industry Leader Committee (ILC) to provide industry knowledge and guidance to the consultant team and Port leadership on the Port's future role in container shipping at Terminal 6 and a sustainable business model for managing and developing the container business.

7.1 Composition of Industry Leader Committee

The ILC convened by the Port in early June 2017 included diverse, statewide representation from: shippers (exporters and importers), service providers (freight forwarders, railroads, barge and trucking industry), carriers, ports, labor, and legislators with strong shipper interests. The chair of the ILC was Linda Pearce, Port of Portland Commission treasurer. In addition, Curtis Robinhold, the Port's executive director, attended most of the meetings. The intent of this committee was to gather the collective knowledge of shippers and shipping interests to identify future strategies for Terminal 6 that provides market access to cargo shippers and a sustainable service model for managing and developing the container business. Each of the members were selected based on: industry, commodity and/or logistics knowledge; long-term vision and demonstrated commitment to the effective and efficient movement of Oregon cargo. A list of Terminal 6 ILC members is included in Table 44 of this report.

Table 44 Industry Leader Committee Membership

Linda Pearce, Chair	Port of Portland Commission, Tillamook County Creamery Association	Treasurer Chief Financial Officer
Del Allen	Allports Forwarding, Inc.	President
Amer Badawi	Columbia Grain, Inc.	Vice President
Brenda Barnes	Geo. S. Bush, Inc.	Export Manager
Jonathan Berndt <u>Alternate:</u> Brian Flood	Expeditors	District Sales Manager
Bob Carroll <u>Alternate:</u> Diana Winther	International Brotherhood of Electrical Workers Local 48	Business Representative
John Ducker	Columbia Sportswear	Senior Director, Global Supply Planning and Logistics
Stu Follen	SL Follen	President
David Gomberg	Oregon House of Representatives	State Representative (D – Lincoln City)
Bill Hansell	Oregon Senate	State Senator (R-Pendleton)
Jana Jarvis	Oregon Trucking Associations	President
Don Karls	BNSF Railway	Director of Port Business Development PNW

Kevin Koronko	Dr Martens	Logistics Manager
Kit LaBelle	Hampton Lumber	Director, Logistics and Documentation
Keith Leavitt	Port of Portland	Chief Commercial Officer
Gary Neal	Port of Morrow	General Manager
Ken Norwood	Union Pacific Railroad	West Coast Ports Manager
Neil Salstrom	Toyo Tanso	Sales Manager, High Tech Division
Mike Stanton	International Longshore Workers Union Local 8	President
Guy Stephenson	Westwood Shipping Lines Inc.	President
Patricia Villalonga <u>Alternate:</u> Bob Wilkerson	The Kroger Group	International Logistics Manager Operations Manager/Seasonal Logistics
Tom Yu	ExpoFreight	Global Accounts Manager
Greg Zanavich	Tidewater Barge Lines	Business Development Manager

Photo 5 Industry Leader Committee



7.2 Committee Meetings

The ILC met five times between June 28, 2017 and December 21, 2017. The first committee meeting established the foundation for the business study and committee's work. The agenda for the four other committee meetings was built around each of the consultant's eight business strategy tasks (Tasks 1-6, and Task 8) enumerated in previous sections of this report. Stakeholder Team Engagement (Task 7) was incorporated into all other consultant tasks through input from the ILC.

These meetings were facilitated by Michael Kosmala from the Coraggio Group, a subcontractor to the consultant. Nolan Gimpel from Advisian participated in all committee meetings, representing the consultant team.

June 28, 2017 - The first meeting was held at Terminal 6 and provided background on Terminal 6 operations and financial history; a tour of Terminal 6; an overview of the committee charge, work plan and schedule; a discussion of collaboration principles; and an introduction of the consultant and Port project team.

August 3, 2017 – The second meeting focused on Industry Situation Analysis (Task 1) and Strength Weakness Opportunities and Threats Analysis (Task 3). The committee also adopted its Collaboration Principles at this meeting (see Table 45).

September 28, 2017 – The third meeting focused on Market Analysis (Task 2) and Operating Model Analysis (Task 4).

November 16, 2017 – The fourth meeting focused on Alternatives Analysis (Task 5) and Financial Analysis (Task 6).

December 21, 2017 – The fifth and final meeting focused on the preliminary recommendations from the consultant group (Task 8) and committee direction to the Port leadership team.

Summaries of each of the ILC meetings can be found on the Port of Portland website at: <https://www2.portofportland.com/marine/Terminal6IndustryLeaders#meeting-materials>.

Photo 6 Industry Leader Committee



Table 45 ILC Collaboration Principles

- Honor your commitment to the committee:
 - Work together to achieve collective good for Oregon shippers.
 - Review meeting materials and come prepared to participate in each meeting. Meeting materials will be provided one week in advance.
 - Participation by members is preferred. If delegates stand in, make sure they are well briefed.
 - If you can't attend a meeting, provide advance notice to Port staff. Stay up-to-speed. There will be an opportunity for electronic comment on technical documents and all meeting materials will be posted on the website for review.
 - Share your expertise.
 - Say what is on your mind.
 - Don't shy away from difficult subjects.
 - Assume the best intent.
 - There are no bad ideas.
 - Seek to understand before being understood.
 - Avoid side conversations. Minimize use of electronics during meetings. Leave the room if needed.
 - Silence means consent.
 - If you disagree with something say so, or better yet propose an alternative.
 - We'll assume you agree if you don't speak up.
 - Stay away from potential anti-trust issues.
 - Call time-out if you are feeling uncomfortable.
 - To support open and honest dialogue among committee members and space for brainstorming:
 - Committee meeting conversations will be summarized by the Facilitator at a high level and not attribute comments to individual committee members. Committee members will have an opportunity to review and refine meeting summaries.
 - Don't attribute any quotes from the meeting outside of the group.
 - When in doubt about what can be shared, ask. This will allow the process and study conclusions to evolve.
 - If contacted by the media or others, share your perspective on the process but defer commenting on conclusions until the study has concluded. The Port will provide stakeholder updates in Fall 2017, and summarize work at key milestones for committee consideration.
-

7.3 Highlights of Committee Recommendations

Throughout the committee process, industry leaders represented on the committee continued to express strong support for the return of Terminal 6 container service and a recognition of Terminal 6's importance to the state from a market access and economic perspective. Oregon is the 14th most trade dependent state in the U.S. There was a collective desire to focus on near term and long-term options for recovering Terminal 6 container service for Oregon shippers (importers and exporters) as well as the necessity of engaging all parties (shippers, stevedores, labor, Port, service providers, state government, and other leaders) to ensure the success of these endeavors.

Based on container industry shifts and financial challenges associated with the Terminal 6 container operations, there was recognition that the most sustainable business model for Terminal 6 was a mixed-use facility that provides revenues to support container service. While recovering weekly transpacific service to Oregon's key import and export markets is a priority, the committee recognized that the Port will need to pursue a niche container service with alliance and independent carriers that own medium sized vessels (5,000-7,000 TEU vessels) and can transit the Columbia River. Asia represents 89% of import market and 87% of the export market. The Port is unable to compete with other west coast ports that can accommodate so called mega-ships.

The committee appreciated the Port's willingness to invest limited funds (associated with prior lease termination) to ready the terminal for long term business while pursuing near term business opportunities that serve regional shippers (e.g., SWIRE container service, and BNSF Railway intermodal service to Seattle/Tacoma), and building confidence in the productivity of the terminal. However, the committee recognized that keeping Terminal 6 open costs \$3-5 million a year and that without other revenues to offset these costs, the Port does not have General Fund to continue to sustain terminal operations over the long term. The committee also recognized that the window is closing for attracting transpacific service before these funds are depleted, but stressed that recovering carrier service and reconnecting the upriver barge system are important initiatives to pursue. Members of the committee expressed strong interest in participating in an ongoing shipper committee to provide support for Terminal 6 container service marketing and other business activities.

Guidance from the ILC included:

- Short Term: Pursue mix of containers and general cargo at Terminal 6 with intermodal and niche container service and return of barge-rail to feed future container service
 - Demonstrate success and mitigate risk concerns through mixed-use of Terminal 6.
 - Use revenues from intermodal and other mixed-use operations to offset Terminal 6 operating losses.
 - Continue to focus on minimizing costs.
 - Build a high level of service so cost is less of a factor.
 - Use rail to grow volumes and carriers.
 - Expand intermodal to include East-West as well as North-South operations and create transload/warehousing opportunities that build container volumes.

- Collaborate with stevedores to create efficiencies on barge-rail.
- Find ways to pool equipment at Terminal 6.
- Expand niche carrier service to provide broader shipper support with second SWIRE service to/from Asia, and addition of other carriers.
- Seek financial assistance from the state to support Terminal 6 service.
- Maintain international shipper outreach and advocacy program.
- Build cargo commitment to volumes to make business case for carriers.
- Long Term: Recruit transpacific container service targeting independents and carriers in alliances with 5,000-7,000 TEU vessels capable of transiting the Columbia River
 - Capitalize on the congestion at Puget Sound ports in marketing efforts.
 - Develop a package to entice carriers with skin in the game by all stakeholders to achieve the long-term goal. This may include reduced Port overhead costs, reduced pilotage and tug costs, market container rates, cargo aggregation, labor cooperation, state contribution and targeted marketing strategy with shipper engagement.
 - Support the Port's marketing of targeted transpacific carriers
 - Continue to build workforce training and productivity of crane operators.

Photo 7 Industry Leader Committee



7.4 Testimony to Port of Portland Commission

In tandem with the consultant recommendations, committee members shared their perspectives with the Port Commission on January 10, 2018. Summaries of committee comments and testimony are included in Appendix A.

8. Task 8 - Findings and Conclusions

8.1 Findings

The following summarizes the Advisian consultant team's findings for each of the six Terminal 6 business study questions.

What is the value proposition of Terminal 6 to container carriers and prospective terminal operators?

Terminal 6 offers a built-out facility, berth availability, strong local support, a pool of cargo, limited competition, and an expectation of labor cooperation.

What are the negatives regarding the value proposition of Terminal 6 to container carriers and prospective terminal operators?

The shrinking supply of container vessels in the transpacific trade small enough to handle the draft restrictions on the Columbia River, the cost and time associated with a Portland call, and a relatively small cargo market present challenges to container operators.

How can Terminal 6 be used to provide efficient market access to cargo shippers?

A direct vessel call at Terminal 6 is the best option for local shippers. Terminal 6 can also help provide efficient market access to shippers by offering rail feeder and equipment pooling services.

Is there a "niche" in the direct trans-ocean container service market that Terminal 6 can occupy?

Terminal 6 could attract an independent carrier with smaller vessels in the transpacific service and possibly attract a South American or Australian carrier. Other niche ports analyzed had anchor tenants, a larger population base close by, and government funding. Examples of viable niche trades for Terminal 6 could be a focus on the movement of refrigerated cargo and/or a focus on the fruit/produce trade between North and South America where vessel sizes are a good fit for the Columbia River.

Is it feasible to use Terminal 6 as a feeder facility to other West Coast terminals either as a complement or an alternative to direct trans-ocean service?

A Terminal 6 vessel feeder operation would likely not be feasible due to the high cost of a U.S. flag vessels and U.S. crew requirements pursuant to the Jones Act. Feeder services to Vancouver, B.C., would be more reasonable but the cost of handling the box three times would be prohibitive.

What is the business model that maximizes the business opportunity at the terminal but is financially sustainable, both for the port and/or potential private partners?

The most viable business model for Terminal 6 is a mixed-use facility with the profits from non-container operations used to help support the container business.

What is the Port's future role in container shipping at Terminal 6?

Terminal 6 has a potential future as a mixed-use facility including niche container services, general cargo and intermodal rail. Revenue from the mix of uses would be necessary to help support a return of weekly transpacific service where the Port is exposed to a much higher degree of operational and financial risk. The Port would need to be a semi-operating port and would need to generate sufficient volume necessary to cover the significant fixed costs of the operation.

8.2 Conclusions

In the last decade, there have been significant changes in the container industry marked by bankruptcies, consolidations and new shipping alliances as well as increasing vessel sizes and competition. The future looks much the same, underscoring the consultant team's conclusion that Terminal 6 will not be able to compete with so-called mega-ports on the West Coast. Terminal 6 is not likely to see a return of weekly transpacific container services by multiple carriers. The Port is best advised to diversify operations at Terminal 6, using revenue from a multi-use business model to help support future container services.

Ships will continue to increase in size in the transpacific trade and this will limit the number of lines that are able to call on Portland. A weekly transpacific service is essential as the Asian market represents nearly 90% of Portland's volume. Even if a transpacific service is obtained, financial success is not assured as the volume requirements are significant. If all goes well, achieving financial sustainability will require that terminal rates are commensurate with operational and labor costs – something that was not achieved in the past. Volumes needed to break-even are high under the dedicated terminal scenario and may be challenging to achieve even in a mixed-use scenario. Financial sustainability will be challenging to achieve even in a mixed-use terminal scenario. Volumes from 2010-2014 averaged 104,000 vessel moves and almost 150,000 vessel moves are needed to break even in the mixed-use terminal scenario. Revenues and profits from non-container vessel operations are essential to the success of Terminal 6. Assumptions regarding labor productivity in the yard/gate, gear-locker and vessel crane operations must be met and maintained. Shippers have established new supply chains and they must be convinced to change back to Portland which they will only do if they believe Terminal 6 service is sustainable.

With all those obstacles, securing the return of weekly transpacific service is a high bar in the current industry paradigm. The reason for pursuing this is to achieve the Port's mission of providing market access to regional importers and exporters. The Port should target weekly niche transpacific service by independent or alliance container carriers with vessels in the transpacific rotation that can transit the Columbia River channel. To recruit and maintain this service, the Port will need the strong support of the regional shipping community, service providers, labor, and government.



Advisian

WorleyParsons Group

Port of Portland
Terminal 6 Container Business Strategy



PORT OF PORTLAND
Possibility. In every direction.®

Appendix A Industry Leader Committee Comments and Testimony

From: Kevin Koronko [<mailto:kevin.koronko@drmartens.com>]

Sent: Friday, December 22, 2017 10:37 AM

To: Leavitt, Keith <Keith.Leavitt@portofportland.com>

Subject: THANK YOU

EXTERNAL EMAIL:

Hi Keith

Just wanted to reiterate my thanks for the opportunity to be on the T6 committee and for the peek behind the curtain of Port Operations. Loved and appreciated the transparency which demonstrated trust and went a long way to clear up any misconceptions put forth by other involved parties.

Bringing together the various stake holders in T6, including labor, was a brilliant move and one that could/should have been done some time ago. The important thing is it finally came together and we all realized the power it has and will have as the Port moves forward.

Dr Martens has supported T6 since 2003 and hope to continue to support T6 moving forward. It's unfortunate that we don't realize what we have until it's gone but closing it down for a couple years may have been a good thing. We now appreciate it more and want its operation to come back. The negative financial impact to Dr Martens per year without T6 is in the 100's of thousands of dollars when we factor in an additional week in transit time, inventory carrying costs and rail costs.

The lost Tax Benefits to the State through lost jobs, the added negative impact on Oregon and Washington roads, bridges and other infrastructure not the least of which, the environment, with the addition of about 2000 extra trucks on the roads hauling ocean containers, needs to be factored into the equation FOR reopening T6. It's my belief when all things are considered, the Commissioners and the Governor will make the correct decision, move forward and reopen T6.

I am unable to attend the Jan 10th meeting but will be supporting you in spirit. Feel free to read the above letter at the meeting if you should choose to do so. Thanks again for all you do in operating the Port! Keep up the great work!

Kind regards,
Kevin Koronko
Logistics Manager
Dr Martens AirWair LLC
www.drmartens.com



1/4/18

Port of Portland

Thank you for the opportunity to participate in the Terminal 6 Industry Leader Committee.

It was an honor to be asked to share our insight and be included in the process. We have had a longstanding relationship with the Port of Portland and were encouraged to see a significant effort made toward making T6 a viable operation again. The diversity of ideas and options presented, all designed to encourage future business, with an eye toward long term viability, were refreshing.

Both Patricia and I are encouraged personally and professionally by the potential to have an operational port back at T6. The economic impact to the community and our organization is significant.

Please feel free to reach out to us in any capacity you feel we can add value to in regard to this effort.

Sincerely,

Patricia Villalonga
International Logistics
The Kroger Company

Robert Wilkerson
Seasonal Supply Chain
The Kroger Company

Let's all go out and feed the people
1014 Vine Street, 12th Floor, Cincinnati, OH 45202



1/7/18

Statement at Port of Portland Commission Meeting

Port of Portland Commissioners, Port Staff, and Attendees:

My name is Brenda Barnes and I work for Geo. S. Bush & Co., Inc., which is an international freight forwarder and Customs house broker. Our company started in Portland in 1888, but I have only worked in the industry since 1988, focusing most of these 30 years on exports. Personally, I am a third generation Oregonian. (My great aunt was the first woman to tag a buck in Oregon.)

Freight forwarders help exporters move their cargo by handling/setting-up the logistics, gaining the cargo entry into the destination country by obtaining the required paperwork, complying to U.S. regulations as well as the destination country's regulations, and trying to stay in business by keeping the exporters happy and wanting to ship again. I have stood before you in the past expressing how important the barge was to exporters when we had carriers calling T-6. Now I stand before you to state T-6 operations are important in keeping companies within Oregon viable in the global economy.

The 6 to 7-month Industry Leader Committee process we all devoted our time to was well organized, and included all facets of our industry involved with T-6 operations, allowing different perspectives to be heard. Every one of us has reasons to want T-6 back into our operations. All operating container terminals have issues that T-6 does not bring: truck turn-time, space for efficient processing, quick connection to rail, or bureaucracy to climb through for answers.

The idea of using the rail for more than just Portland cargo allows the gate of the terminal to be open throughout the work week so that the container portion can operate normally. I am excited to use the new services as they come to T-6 for existing business, but the new services may also bring new business no one has thought of yet. The future for all of us is much brighter with T-6 operations back in the picture.

Brenda Barnes, Geo. S. Bush & Co., Inc.

Telephone (503) 228-6501

On the Web at WWW.GEOSBUSH.COM

Fax (503) 294-0432

FOREIGN FREIGHT FORWARDERS

SEA AND AIR

FMC NO. 162 IATA NO. 38-5-7837

CUSTOM BROKER

CHB LIC. NO. 38



January 8, 2018

Good morning distinguished Commissioners of the Port of Portland, Port staff and guests:

My name is Del Allen, President of Allports Companies, a local International Freight Forwarder, U.S. Customs Broker and native Oregonian. I have nearly 40 years of experience in the business of International Trade and Logistics and Allports Forwarding will celebrate its 32nd year in business in 2018.

It has been an extreme honor to be a part of the Port of Portland's Terminal 6 Industry Leader Committee, working closely together with fellow Freight Forwarders, Customs Brokers, Ports, Carriers, Importers/Exporters, Labor and the national consultant team on the business study. The past six months collaborating with the committee in reviewing and providing guidance on the analysis of the business study by the national consultant has been extremely rewarding.

This Port is viable and is an important economic engine for our region. In my opinion, to be successful, the Port will need to redefine its role, continue to engage all stakeholders in the process, and obtain local, state, regional political and financial support.

Much of western regional business leaders, politicians and general populous are unaware of the critical importance of international market access, the magnitude of the current situation, and the importance of global trade to the region's economic health.

It is imperative that we take all steps necessary to ensure that the Columbia River and namely the Port of Portland's Terminal 6 remains open to the world for business as a multi-use facility.

As has been stated in the past, this isn't about the Port of Portland. It's about this region and the billions of dollars of waterborne trade moving annually through a water system that has proven to be cost effective, reliable and supports green initiatives.

The previous executive director of the Port once stated and his comment is so poignant today, "The Columbia River is the region's link to world markets and a strategic trade corridor for the nation. Literally, for Oregon agriculture producers, this is their farm to market transportation system....and right now, there is no investment more important to our connection with trading partners around the globe than the regions Container Terminal located in Portland".

In the long-term, it's in everyone's interest to get things working at Terminal 6, seeing carrier and rail service operational at Terminal 6 not just for the sake of Portland but for the regional importers and exports who have daily movements of cargo into global markets.



Regional economic growth is strong, and the outlook is good. Having strong truck and rail infrastructure in place to exploit connections going north, south, east and west would further promote development of major distribution centers in the region and our economy. There is sufficient cargo in the region to be of interest to container carriers and rail operators in the movement of cargo in all directions.

Developing Terminal 6 as a multi-use facility will redefine its purpose, future and launch new strategies for strategic growth and prosperity for the region.

Importers and exporters are suffering because of the vast volume of container cargo that comes through northern and southern ports. Getting cargo through these large terminals (i.e., Seattle/Tacoma and Los Angeles/Long Beach), through the gate, onto truck/rail and delivered on time is challenging at best. A niche operation at Terminal 6 could drive the timeliness of scheduled deliveries to Beneficial Cargo Owners to unprecedented visibility, speed and accuracy.

As previously stated, this is not an exclusive Port of Portland operational problem. This is a state and regional issue. To be successful, everyone needs to have a little skin in the game to achieve effective, responsible and long-term goals. This would include, but not be limited to, recovery of shipper cargo volumes, reduction of Port overhead costs, labor cooperation, and targeted marketing strategy with full engagement of all affected parties. If all parties are committed to the process, commit to the long-term investment, and share in economics involved, we can further this economic driver and create profitability for all stakeholders and business.

We should extend support to importers and exporters, locally, regionally and nationally and provide financial incentives to support Terminal 6 and not to go anywhere else. There is room to capitalize on congestion issues at other West Coast ports. Predictability is a vital selling point as cargo owners want visibility and consistency door-to-door. In this market, they do not have this, and it is truly an expensive intangible cost.

The Port's success will be in a mix-use facility, generating profits from a combination of mixed uses, including but not limited to container, breakbulk, intermodal, container yard and multi-directional rail services.

People talk about international trade being a commodity business that is supported by competitive market access. Global transportation is an expensive game, is highly competitive and volatile. The continued consolidation of ports, global carriers, stevedores, trucking companies, terminal operations, supply chain professionals, etc., are based on reduction of costs which contributes to diminished customer service. This new paradigm affects the ability of importers/exporters to move cargo efficiently which increases the cost of goods to consumers exponentially.

Everyone wants to be large enough to survive in this global economy but at what price? A terminal operation at the Port of Portland's Terminal 6 can become highly customer-centric, develop close and long-term relationships, and provide accuracy and visibility in their services. The Port of Portland is an economic engine to state, regional and national economies and should be provided financial funding, incentives and support to be successful.



The Industry Leader Committee recognizes and appreciates the Port's willingness to invest funds to ready the terminal for long-term business and focus on new business development. These efforts allowed the Port to secure commitments from Swire Shipping and BNSF intermodal to begin building confidence in the facility and further enhance the prospects of showing the world that this facility is open and ready for business.

This new business provides a foundation for the Port and its stakeholders to develop a package to entice container carriers and key transportation service providers to commit to Terminal 6.

My passion for the success of Terminal 6, the sovereign Columbia River, and this industry that affects so many family wage jobs and livelihoods is unparalleled. I am eager and ready to continue the work still in front of us in bringing back a stable and economic engine to this region soon.

Most sincere regards,

Del Allen, CEO/President
Allports Forwarding Inc.
Allports Incorporated

January 09, 2018

To: Port of Portland Commission
From: Stuart Follen, Member T-6 Industry Leader Committee

Dear Commission,

I have asked that my comments be read as I am currently out of town and unavailable to attend this meeting. For the last 30+ years, our group of companies have been involved in the import and export business utilizing the services of many USA ports. So, we are very familiar with the strengths and weaknesses of all the West Coast ports. In addition, we have seen the evolution of the shipping industry over the last 30+ years and the subsequent impact it has had on all the ports. Below I have outlined my personal opinions regarding the future of the T-6 terminal going forward.

Future of Terminal 6

Change is inevitable. It is how we adapt to change that decides our viability. Today, retail "brick and mortar" businesses are trying to figure out how to survive in the new e-commerce economy. 60 years ago... "Mom and Pop" grocery stores tried to figure out how to survive against the emerging national "chain stores"....like Safeway, Albertson, and Kroger. While "John's Market" on the corner of 42nd and Sandy may have closed, it was only a few years later that 7-11 and Plaid Pantry Markets started popping up all over Portland and continue today. Why? Their prices were higher...they had limited selection. They survived, because they served a niche that people wanted. They served a niche that the big retailers could not provide. John's Market may have disappeared...but the "new Mom and Pop" grocery is now 7-11. Change...evolve...adapt, find and serve the niche markets that people want.

The T-6 Niche

T-6 can be the "niche" port on the West Coast. No, we are never going to be a port of call for a 20,000 TEU Mega ship. Ships are getting bigger and bigger...just like retail markets in the 1960's. But, this very trend which has hampered growth at T-6, offers a huge opportunity for the future. Find the niches...they are out there. North - South Trade...with Central and South America and Europe...is a niche market with huge potential. And...the vessels servicing these areas are smaller...a perfect fit for Portland.

In addition, T-6 is perfectly positioned to expedite e-commerce growth overseas with both "air and ocean". This is a "new industry"...that is poised to explode. E-commerce is high value...freight costs are a very small % of overall costs. So, building efficient distribution systems is the way to capture this explosive industry.

The Future

T-6 has a future...but we need to adapt. Portland is perfectly placed to succeed with the correct plan. We will never be Seattle/Tacoma or Long Beach/LA. But, we never were.

Closing Terminal 6 would be a huge mistake. So many other terminals are hampered by congestion....taking days for cargo to make it from ship to "rail or truck".

Conclusion

Now is not the time to "quit". Now is the time for vision and change. Now is the time to identify niches...create efficiencies, and serve the markets that are "coming in the future". It is the time to lead...not follow. It is the time to know and understand where Portland "fits". No, it is certainly not the time to quit.

Regards,

Stuart Follen
President, SL Follen



January 9, 2018

To: Port of Portland
Advisian
Coraggio Group

Re: Terminal 6 Industry Leader Committee

I am writing to express Tidewater's thanks for being invited to participate on the Terminal 6 Industry Leader Committee over the past seven months. We have participated in similar endeavors over the years and your team conducted a most thorough and well-organized program. Tidewater has been involved with the operations at T-6 since the first shipment of containers was delivered there by barge. We can also claim that we delivered the most recent shipment of containers to T-6 by barge back in early 2015 and we are confident that there will be more to come in the future. My own involvement with T-6 spans 20 years not just with Tidewater but also while working previously for two ocean carriers calling the terminal. Over that time, there have been many changes in the local market needing international ocean carriage, West Coast ports, the ocean carrier market, and the ancillary modes of transport involved with moving goods to and from Pacific Northwest ports. Many of these changes have not been advantageous to sustaining ongoing business at the terminal.

The Port and its team conducted a very thorough examination of operating costs and what will be necessary going forward to cover those costs. With a breakeven target of roughly the terminal's volume during its best years, it is clear achieving sustainable business will be neither quick nor easy. That volume represents the majority of Portland's draw area for containerized cargo. This cargo has not stayed idle for three years. It has found alternatives to get to ports further away where there already exists far greater ocean carrier options compared to T-6 over the last decade. Although local shippers have many reasons to want service back at T-6, they will not drop their current options and direct significant volume to vessels calling Portland until there is a proven record of reliable service and competitiveness. This will take years, not months. We support your group's recommendation to develop a mixed-use terminal with the goal of attracting container service along with other business lines. Ports along the Columbia River are successful handling autos, bulk materials, and breakbulk cargo. For example, collectively, our local ports are the largest export gateway for U.S. wheat. Restarting T-6 by combining similar operations our region is successful at in conjunction with container service is the best plan. Like all plans, that will change but it provides a platform now to move forward.

Tidewater has appreciated the opportunity to be involved with this process. We know that your efforts to have sustainable service at T-6 will be ongoing and we aspire to remain engaged.

Regards,

A handwritten signature in black ink, appearing to read 'Greg Zanavich'.

Greg Zanavich

From: Mike Stanton [mailto:ilwu8@yahoo.com]
Sent: Tuesday, January 09, 2018 2:15 PM
To: Glancy, Lise <Lise.Glancy@portofportland.com>
Subject: Terminal 6 Business Study

EXTERNAL EMAIL:

Hello, my name is Mike Stanton. I am the current president of the International Longshore and Warehouse Union Local 8 here in Portland Oregon.

First of all, I would like to say I felt privileged to be included in the Terminal 6 Industry Leader Committee. The executive director and his exceptional staff put together a committee of people that were a very good representation of the groups or companies that would possibly be affected by the re-opening or non-re-opening of Terminal 6.

The group was been facilitated well and hopefully has had some effect on the path that the Port has decided to follow to continue its mission to enhance the region's economy by providing efficient cargo access.

The men and women of the ILWU have been loading and unloading cargo on Portland docks since 1934, and we've seen many changes over the decades. We see the relationship with Swire Shipping as a very positive step for our state and region. Longshore workers have been hard at work at the Port of Portland's other terminals, handling cars, bulk cargo, grain and other goods. We are happy to be adding containers and bow cargo at Terminal 6 to the work we've been doing and are looking forward to working with other labor groups, the Port, and the terminal customers to ensure that Terminal 6 is given every opportunity to excel and grow into a busy terminal that is an asset to the local region and the port.

Over the last two weeks, containers and cargo have started to flow into Terminal 6 to support the rail transload operation and staging of cargo for the first Swire vessel call coming soon. Harbor Industrial, the Port management, and the ILWU locals have worked very hard to put the right people in the right positions to make the terminal opening a success.

I hope that the Port Commission recognizes the effort that the Terminal 6 Industry Leader Committee, the port staff, and the individuals at the terminal have put into the reopening of the terminal. And I hope the Commission continues to support programs and ideas that will ensure that the Port's Marine Division continues to create jobs and growth for the region. Thank you.

Mike Stanton
President, ILWU Local 8
2435 NW Front Ave.
Portland, Or. 97209
C: 503-730-8847
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To: Port of Portland Commission
From: Guy C. Stephenson
January 10, 2018
Re: Industry Leaders Review and Recommendations for Terminal 6

Good morning: My apologies for not being able to attend the Commission meeting, and many thanks for accepting these written comments, which are offered in my personal capacity only.

I have been President and CEO of Westwood Shipping Lines, Inc. for the past ten years. Westwood is a "non-alliance" carrier that operates a fleet of seven ships in the North Pacific trade lane. Our west coast service calls the ports of Everett, Tacoma, Vancouver BC, and a monthly mill call at Longview. Our service to Asia includes ports in Japan, Korea and northern China. Westwood is the second largest carrier of containers from Japan to the PNW, and in the top five from Korea. From 2010-2016 Westwood made a monthly westbound container call at T-6. We were the last carrier of containers to leave Portland.

As a "conbulk" carrier Westwood carries a mix of containerized and non-containerized cargos including project cargo and heavy lift. Our container business is both local and intermodal with regular service to the Midwest of the U.S. and Canada. Westwood is one of the few conbulk carriers that operates on a fixed schedule. Our schedule integrity is among the best in the industry.

I am very pleased to be a part of the Industry Leaders Review Committee. This review process was very thorough and expertly conducted. Difficult questions were not avoided, and candid discussion was encouraged. As a result of the review process, the recommendation is for a mixed-use terminal, for the reasons stated in the report. I support that conclusion.

The collapse of the container operation at T-6 created hardships for local and regional shippers, and certainly forced "alliance" carriers to eliminate Portland from their schedules. For a container carrier, Portland has always been a high-cost call, and it will be difficult to attract an "alliance" carrier unless it can achieve the volumes and cargo operation production necessary to make a call profitable. This will require both import and export volumes. After two years of shut-down, such a decision would be very high risk, especially since there are numerous alternatives through ports in Washington State, BC, and even California, particularly for the import business. Other obstacles to a "container only" operation include Portland's present reputation for labor/management issues and the terminal's history of operating losses, whether operated by the Port or by private companies.

A mixed-use terminal seems the best alternative, as it will not require the Port to run the financial risks necessary to return to a container only operation. A mixed-use terminal will attract a wide variety of businesses, and will make better use of the terminal's size. This should lower the costs to any carrier that might wish to call T-6, whether for container or non-containerized cargo. Mixed use has the best potential to make this very important property again serve its purpose to support commerce in the Columbia River Basin, and greater PNW.

I would be happy to make myself available for follow up questions, and to continue to work on this very important issue.

Guy C. Stephenson

Testimony at Port of Portland Commission Meeting

January 10, 2018

Hello Commissioners, I'm Bob Carroll, a Business Representative of the International Brotherhood of Electrical Workers and the President of the District Council of Trades Unions representing the Maintenance Workers at the Marine Terminals. Thanks for allowing me to speak today.

Being a part of this committee has been both a privilege and educational. I learned a tremendous amount about the dynamics of the container shipping industry and the changes that are happening worldwide but more specifically in the Pacific. It was also interesting to hear what the other committee members had to say about the import-export/shipping industry from their perspective.

I have been associated with the Marine Terminals as a Union Representative for almost 11 years now and have seen fluctuations, turmoil, business upheaval and labor strife. As a result, the DCTU member numbers have declined, especially the IBEW.

The myriad issues that determine if the Port can be successful at T6 are many and varied, including rail, channel depth, traffic and other infrastructure. The fact that the Port has reached out and drawn together the type of committee they did is encouraging and I believe that the Port is and putting in the time and the work to make the Terminal successful. I think that all of us on the committee and at the Port understand that the time is now to take great strides in getting T6 up and running since it has been and will be an economic driver in this community.

Even during the time that T6 has been shut down, the Port has committed the resources to the Maintenance Department to continue to upgrade certain cranes and do routine maintenance to ensure that when the Gate opens the Terminal is ready for business.

It is vital that Terminal 6 be successful, that success will benefit the community, business, labor, the Port and not least on my mind, the District Council of Trades Unions and the IBEW.

Thank you.

Bob Carroll, Business Representative
IBEW Local 48



PORT OF MORROW

Alice Cuprill-Comas, Commission President
Port of Portland Commission
PO Box 3529
Portland Or. 97208

January 8, 2018

RE: Industry Leader Committee Terminal 6 Comments

President Cuprill-Comas, Commission Members:

I wanted to share with you my appreciation for being able to serve on the Committee to identify potential ways to support bringing container service back to Terminal 6 for the benefit of Oregon and the shippers that depend on import and export services to successfully do business in Oregon and beyond.

I have been involved with the Columbia-Snake River System as a Port Manager for over 34 years and the Port of Portland Terminal 6 facilities have been a critical part of the economy that surrounds the regions I have served. The Port of Portland and its role as the gateway to the Pacific Rim and beyond is a key link that requires all of us to work together to support the import and export potential that we have enjoyed in the past and strive to reinstitute for the future.

The Port of Morrow's businesses in the Eastern portion of the State along the Columbia River are primarily export operations shipping products throughout the world. Terminal 6 is the first choice to export if our shippers can access the steamship lines that deliver to the locations they serve. There are many reasons why we have lost the service through Portland, including consolidation in the steamship industry, size of ships, labor, and other factors; however, we need to continue our efforts to identify pathways that will bring services back to Portland. As you are aware, the Port has had recent success in the startup of the SWIRE container service and has had the opportunity to identify other niche type services that shippers from Oregon may benefit from. The need for potential intermodal services can be another opportunity that assists Oregon's import and export community. Oregon, being number 14 in states dependent on trade, most definitely needs access to those worldwide markets. Key markets that Oregon shippers need to access are from Asia, 89% are import markets and 87% are export markets.

How do we continue to pursue this desperately needed service? I believe it takes support from all fronts. Our export shippers rely on containers that are positioned through Portland in order to use those containers for product shipment to the Asian market. We need our importers to participate in directing their product through the Port of Portland Terminal 6. Oregon has many large importers that call Oregon home. How can we solicit their commitment to redirect containers through Portland to be able to attract steamship lines to call on Portland? We need the support of the Oregon Legislature to assist in identifying financial incentives or other alternatives to encourage participation from Oregon importers to help bring import containers through Terminal 6 to be able to generate containers to be utilized for exporting. There might be a tax incentive or some other benefit to those importers that pay Oregon income taxes that would ultimately help generate the much-needed steamship service at Terminal 6. The Port of Portland needs to receive financial assistance for at least a 5-year period while strategies for carrier services continue to be developed, pursued and successfully brought to fruition.

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Oregon Lottery proceeds should be allocated to commit \$5 million per year for the next 5 years to shore up the Port of Portland's and Oregon's commitment to the international trade we are dependent on in our ongoing economies in most regions of the State. The short-term and long-term success of these efforts are too important to not place Terminal 6 at the highest priority for Oregon as a trade dependent state.

The challenges the Port of Portland has had to financially carry this burden is a State of Oregon issue, not just Port of Portland and having financial assistance on this statewide need benefits all importers and exporters located in Oregon. Another consideration for assistance could be mitigating the cost of pilotage from the mouth of the Columbia River to Terminal 6. Again, mitigating the cost of calling on Portland by the steamship lines.

There are several short-term strategies as well as long-term recruitment ideas and efforts that are specifically addressed in the Committee's Guidance Report that will require continued support from this Commission. You have a well-qualified and dedicated staff that have been a part of the strategic process to date and the state of Oregon is well represented in the committee participation and the staff of the Port of Portland. I know that most committee members are involved because they have either a vested interest or a desire to see the steamship service and imports and exports travel through Terminal 6 to their ultimate destination for the benefit of all involved. Please let us know how we can help in the next steps as you decide how to proceed.

Sincerely

Gary Neal


General Manager
Port of Morrow

cc: Speaker Tina Kotek
State Representative Greg Smith
State Senator Bill Hansell