



Trade and Logistics Report: Concepts and Business Case Analysis

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I. Introduction

Overview

Containerized trade is a large and vital part of the Oregon economy, linked to the health of agricultural, forestry, manufacturing, and distribution sectors. The Port of Portland has a long history of containerized shipping service from major international operators. Hanjin and Hapag-Lloyd discontinued their weekly Portland vessel calls in early 2015, however, with little advance notice.

Suspension of direct weekly container service at the Port of Portland's Terminal 6, international changes in the maritime industry, and other freight transportation issues pose a series of challenges to Oregon shippers, to public agencies charged with trade and economic development, and to the State of Oregon as a whole. The impacts identified by The Tioga Group place much of Oregon's trade at risk with:

- Uncertainty for Oregon exporters and importers, including agriculture, manufacturing, and distribution companies;
- Increased transit times and reduced reliability;
- Increased logistics costs;
- Loss of markets and market share;
- Increased business risks for transportation and logistics providers; and
- Potential relocation of businesses to other states that offer direct container service.

While shippers may absorb near term cost increases, multiple years of uncertainty and cost increases threaten long-term markets and business viability. Finding interim freight logistics solutions is a time sensitive issue due to the perishability of products and global competition. If Oregon businesses cannot access key markets at competitive prices, they risk losing market and market share to other countries with competing products.

What can Oregon public agencies do to help the state's shippers cope with the loss of weekly Portland service, to strengthen the Port's ability to attract and retain service, and to improve Oregon's long-term trade and logistics capabilities?

These questions were posed to the Trade and Logistic Steering Committee, The Tioga Group, and the shipping community at public forums. This report addresses these questions and identifies potential freight proposals for action and/or implementation by the state, as well as recommendations on other measures that can support Oregon international trade.

II. Potential Trade and Logistics Proposals

Approach

Over 20 potential freight logistics proposals were identified through trade research, interviews and statewide forums. The Tioga Group reviewed all suggestions for high-level feasibility using evaluation criteria identified by the Steering Committee:

- Technical, economic, and operational feasibility;
- Identifiable benefits to Oregon shippers;
- Consistency with the long-term interests of shippers and the state as a whole.
- Consistency with resumption of weekly vessel service at Portland; and
- A well-defined and viable public agency role.

Many trade and logistics proposals fit within the current scope of agency activities or represent opportunities for the private sector; three of the proposals did not have a direct public agency role, would not address near-term problems, or did not appear feasible based on current industry conditions.

Business Cases

The Tioga Group identified six of the more promising suggestions for development of detailed business cases for possible action. These are discussed in detail in Section III of this report.

- Port trucker information system - A trucker information system would provide truck drivers accessing Portland and Puget Sound ports with information needed to more efficiently plan trips around highway, terminal access road, and terminal gates congestion and vessel schedules;
- Truck driver training – Expansion of the truck driver pool would help address the shortage of truck drivers in Oregon needed to move international container cargo;
- Satellite container yards - Satellite depot/drop lot/dray-off yards would provide storage areas for empty containers and chassis for use by other shippers as well as staging of export containers;
- New rail intermodal services and yard – Assessment of the feasibility and requirements of new intermodal rail services and yard in the Willamette Valley would help determine if this is an option for reducing shipper transportation costs and taking trucks off the highway;
- Columbia River container barge and rail service – Return of the Columbia River Barge/Rail service would help shippers in eastern Washington, Oregon and Idaho move containerized agricultural products cost-effectively to markets in Asia, and address the shortage of truck drivers and chassis availability east of the Cascades; and

- Portland transloading, cold storage, and logistics services – Expansion and anchoring of transloading and logistics services in the Portland area could help provide a balance of imports and exports needed to secure new container service

RECOMMENDED FREIGHT LOGISTICS PROPOSALS

In addition to the six business cases, the following additional measures have been suggested to provide assistance to Oregon shippers in coping with the loss of weekly container vessel service at Portland, and also provide long-term benefits.

a. Facilitating Customs Processing at Tacoma and Seattle

The Port of Portland is part of the Customs and Border Protection (CBP) Columbia-Snake River District, while the Ports of Seattle and Tacoma are in CBP's Seattle District. Some shippers reported delays with CBP processing at Seattle or Tacoma. These delays were attributed to unfamiliarity with former Terminal 6 (T-6) importers and import goods, and a shortfall in CBP staffing compounded by the West Coast port congestion in 2014-15. It is possible that this problem will disappear over time as CBP staff in Seattle and Tacoma gain experience with importers that formerly shipped via Portland and the commodities they handle.

CBP staffing shortfalls are a recurrent concern at many U.S. ports. In some instances, growing cargo volumes, new trade patterns, and workload peaking due to megaship arrivals may have overburdened CBP staff resources. Stakeholders have also noted longstanding inconsistency between CBP Districts. Attaining consistency is beyond the Trade and Logistics Initiative scope, but there may be an advantage in addressing specific differences that cause importers to avoid Portland.

b. Facilitating the Use of 3PLs, Cooperatives, and Shipper Associations for Small Shippers

The kind of challenges facing small Oregon shippers have long been addressed by using third parties or forming shipper associations and cooperatives to move smaller cargo volumes efficiently and cost effectively. Third-party logistics firms (3PLs) include freight forwarders, customs brokers, consolidators, transloaders, and firms that combine many of these functions. These firms offer expertise in identifying efficient options and minimizing cost. Many of the 3PLs serving Oregon customers are shown in Exhibit 1.

Exhibit 1: 3PL Firms, Port of Portland Website

A.C. Wilson Co., LLC	International Freight Systems
Allports Forwarding, Inc.	James J. Boyle and Co.
AzTex Global Delivery Solutions LLC	Kamino International Transport
BFS International LLC	Kintetsu World Express
Brownstone International	Kuehne & Nagel, Inc.
C.H. Robinson Worldwide Inc.	L.D. Tonsager & Sons, Inc.
CDS Global Logistics, Inc.	Lynden International
CEVA	Mid-America Overseas, Inc.
Chipman Relocations	MTI Worldwide Logistics/Portland Branch
Coppersmith	Nippon Express USA, Inc.
DHL Danzas - Air and Ocean	NNR Global Logistics
Double River Forwarding, LLC	OEC Group
Dragon America Logistics, Inc.	OIA Global Logistics
DSV Air and Ocean	Pathfinder Logistics, Inc.
Exel Global Logistics	Pilot Freight Services
Expeditors International	Schenker International
Fedex Trade Networks	T.I.C. Agencies, Inc.
Gallagher Transport Int'l., Inc.	TLR/Total Logistics Resource, Inc.
Geo. S. Bush and Co., Inc.	UPS Supply Chain Solutions
Global Trading Resources, Inc.	W.J. Byrnes & Company
IJS Global Inc.	Wymore Transfer Co.
Independent Dispatch, Inc.	Yusen Air & Sea Service USA., Inc.

Cooperatives and producers' associations are common in the agricultural sector (e.g., Hazelnut Growers of Oregon or Oregon Cherry Growers), and some arrange and manage transportation of members' shipments (Sunkist is a well-known example).

Shippers associations are often set up for the explicit purpose of pooling member cargo to obtain better rates and services than small- and medium-sized businesses (SMEs) can obtain individually. Existing shipper associations include:

- Columbia River Shippers Association – located in Portland (www.crsa-oregon-tripod.com)
- Food Shippers Association of North America – based in Renton, WA (www.fsana.org)
- Pacific Northwest Asia Shippers Association – operated out of Puget Sound and mostly focused on forest products
- Pacific Northwest Association of Rail Shippers – based in West Linn, (www.pnrailshippers.com)
- Columbia Gorge Fruit Growers – based in Hood River (www.cgfg.org)
- Idaho-Oregon Fruit and Vegetable Association – based in McCall, ID (www.id-orfv.org)

c. Monitoring Rail Intermodal Services

Northwest Container Services (NWCS) provides rail intermodal service between its Portland terminal and the ports of Tacoma and Seattle. NWCS provides an efficient alternative to trucking for Oregon shippers using the Puget Sound ports for imports or exports.

Prior to the 2014-15, West Coast port congestion and loss of T-6 service, NWCS served Oregon shippers that chose to ship via Tacoma or Seattle to access additional foreign ports, use particular ocean carriers, ship on different schedules, or take advantage of other shipping options not available or less efficient at Portland. While weekly Portland service is suspended, NWCS also serves shippers who use the Puget Sound ports as a second choice. Currently, NWCS handles about 50% of export traffic. These needs and shipper preferences will remain even after direct weekly service resumes at Portland. Oregon shippers benefit from having additional options, from competition between Portland and Puget Sound services, and from competition between NWCS and truckers.

The combination of Portland container service withdrawal, West Coast port congestion, and an influx of westbound empties congested NWCS service and terminals in early 2015, leading to service shortfalls. With a return to more normal conditions and NWCS investment in terminal handling capacity, the system is now providing adequate service with reserve capacity.

The long-term importance of rail intermodal service to Oregon customers suggests that responsible public entities should continue to monitor system performance as part of the state's overall trade and logistics capabilities.

d. Monitoring Chassis Supply

Chassis supply has become a nationwide issue in recent years. Ocean carriers have ceased to provide container chassis as part of their service or rates, and have sold their fleets to pool operators such as TRAC Intermodal, DCLI, or Flexi-van. Instead of obtaining an ocean carrier chassis at the marine terminal, truckers must now locate a pool chassis (at the terminal or nearby) or purchase/lease their own chassis.

At issue are both the number of chassis available and the need to match each container with an eligible chassis. Many Oregon shippers of heavy commodities rely on the use of tri-axle or "super" chassis to move their loads safely and legally. Tri-axle chassis are considerably more expensive than ordinary dual-axle chassis, and tend to be in short supply in peak agricultural shipping seasons. The longer times and distances required to move containers to Seattle or Tacoma have effectively reduced the carrying capacity of the tri-axle chassis fleet, exacerbating the periodic shortages.

While this situation will likely take years to resolve across the container shipping industry, Oregon shippers have reported specific near-term problems relating to chassis supply and logistics. Chassis supply bears monitoring as an essential part of state trade capabilities.

e. Monitoring Westwood Vessel Staging Effectiveness

Multiple monthly Westwood vessels have been handled at T-6 since cessation of Hanjin and Hapag-Lloyd services. These vessels have handled only export loads through January 2016. These vessels have been handled by:

- Staging export containers at off-terminal facilities, e.g., Portland Container Repair, and.
- Positioning the export containers at T-6 immediately prior to vessel arrival.

This procedure accommodates once weekly gate openings at T-6 container yard to prepare for monthly Westwood vessel calls. Westwood reportedly would like to increase vessel frequency and to handle imports as well as exports. Identifying importers for this service will be key to expansion of this service. It is in the interest of Oregon shippers for this service to continue and the potential expansion to go forward.

The ICTSI and the Port should continue their efforts to grow the Westwood operations at Portland T-6 as part of the Trade and Logistics Initiative, including outreach to potential both importers and exporters.

f. Facilitating T-6 Labor/Management Issue Resolution

The ongoing labor/management dispute at T-6 and the adversarial relationship between ICTSI, the T-6 terminal tenant/operator, and the International Longshore and Warehouse Union (ILWU) Local 8, T-6 marine terminal workforce, are major barriers to resumption of direct vessel calls at Portland.

In 2011, the Port of Portland entered into a 25-year contract with ICTSI, a private terminal operator, to manage T-6. ICTSI is the fourth largest container terminal operator in the world. Although the Port previously operated T-6 directly, most U.S. container ports function as “landlords”, with actual terminal operations managed by independent stevedores such as ICTSI. Since the Port itself does not operate T-6, the Port does not have a direct relationship with the ILWU related to container operations.

Due to its critical importance to Oregon shippers, the state of Oregon should explore all options for addressing the T-6 labor/management issues. This will require collaboration with ICTSI, ILWU, IBEW (refrigerated container maintenance and repair workforce), the Pacific Maritime Association (employer of the ILWU), and the Port.

g. Container Re-Use Program

“Street turns” or a similar term, “Match-Back” are instances where an empty import container is used for an export load without first being returned to a terminal or depot. Container re-use programs are highly advantageous when they can be arranged, especially if they avoid long or time-consuming trips to the port. There are several types of street turns:

- **Trucker Customer Base.** Most street turns consist of a trucker re-using a container from an import customer for an export customer within the trucker’s own customer base.
- **Street Interchange.** Direct equipment interchange between two truckers with different customers is difficult and rare.
- **Same-Customer Reuse.** Some customers that are both importers and exporters can re-use their import containers for export loads, but the situation is uncommon.
- **Container Depot Reuse.** In some ports, most “street turns” actually consist of return to a depot and re-use by a second trucker or transloader.

The potential for street turns, however, is very limited for multiple reasons:

- Container types and specifications must be compatible with import and export loads. Hay or wood pulp, for example, cannot be loaded in food-grade containers. Heavy exports such as pulses need heavy-duty 20-foot containers, while import consumer goods usually arrive in high-cube 40-foot containers.
- The import container must belong to the export ocean carrier. Despite physical interchangeability, ocean carriers do not accept each other’s containers.
- The import carrier must approve re-use and allow sufficient free time. In peak season, carriers often want their import containers back as soon as possible for additional import loads.
- Import and export timing must match despite seasonality of both.
- Import and export locations must be close enough to be feasible and advantageous despite the lack of import destinations in major export production areas.

Match Back Systems is a commercial provider of load-matching “street turn” software. The latest version, Matchwerks 2.0, was released in July 2015. The software-as-a-service (SaaS) offering is designed to assist steamship lines, truckers, and customers to find empty containers for export and export use opportunities for empty import containers without returning to port terminals. The Match Back software approach was introduced in 2013, and has yet to be widely adopted based on The Tioga Group’s knowledge.

Truckers and shippers already have incentives to seek street turns and re-use containers whenever possible. There is relatively little that a public agency can do directly to increase the frequency of street turns. Previous efforts at establishing “virtual container yards” at major ports such as New York-New Jersey and Los Angeles were disappointing. To the extent that increased container depot capacity or additional depot locations can facilitate re-use, the satellite yard concept may be more productive.

Public agencies might, however, encourage private sector participants to seek re-use opportunities by facilitating communications between importers and exports or by supporting pilot or start-up efforts by private sector organizations to do so.

h. Monitoring Barge Service Capability

Tidewater Barge container service between Boardman, Pasco, Lewiston, and Portland was a significant factor in sustaining direct vessel calls at T-6. The economics of barge service attracted import and particularly export cargo to Portland that might otherwise have been trucked to and from Tacoma and Seattle. The containers were moved on the decks of Tidewater barges that were carrying bulk or break-bulk commodities such as grain or fuel. The barge capacity still exists because Tidewater continues to operate barge service for the bulk and break-bulk cargo.

To support container-on-barge service, Tidewater or its customers need to maintain terminals and handling equipment suitable for containers. A long period without container business could render these capabilities surplus. Divestment by Tidewater or deferred maintenance could create barriers to easy resumption of container-on-barge service. Monitoring of container barge capability in the Columbia River should continue.

i. Sustaining Stakeholder Engagement

Stakeholder engagement can take many forms, as demonstrated by the statewide shippers' workshops, working groups and advisory committees created for the Trade and Logistics Initiative to date. Stakeholder engagement has multiple benefits:

- Keeping public agencies and decision-makers in touch with current Oregon transportation issues.
- Forging ongoing communications links between public and private sectors.
- Identifying common problems and potential proposals.
- Connecting private sector shippers, carriers, and 3PLs.

Ongoing stakeholder engagement will be a critical factor in the ability of public agencies to monitor industry performance, identify shortfalls, and gauge progress toward the state's transportation objectives. These efforts should be continued.

Efforts to attract new container service to T-6 would likewise benefit from the involvement of influential stakeholders, specifically the beneficial cargo owners (BCOs), brokers, and third parties that control containerized imports and exports. The strongest case for new Portland vessel calls would involve:

- Importers and exporters willing to shift business from other carriers.
- Importers and exporters with new trade flows to offer.
- Importers and exporters willing to pay direct Portland rates and commit volumes that would justify direct Portland calls.

j. Policy and Regulatory Changes

There may be state or local policies, rules, regulations, or procedures that restrict Oregon shippers from using efficient practices or adapting to new requirements. As noted in the stakeholder forums, for example, Federal rules effectively require port drayage truck drivers to be at least 21 years old. Insurers and company rules normally require new drivers to have at least two years of

truck driving experience, making 23 the effective minimum age and eliminating 18-22 year olds from the driver pool.

Trade and industry associations have typically served as representatives of their members in identifying restrictive rules or laws and suggesting changes. Individual importers, exporters, truckers, and other stakeholders could also provide input on these issues through Trade and Logistics Initiative stakeholder engagement. State agencies should support these efforts as appropriate.

One particular issue raised in the shippers meetings is the use of *ConnectOregon* funds. Some stakeholders advocated using funds to support freight infrastructure and operations, and customer needs. Previous freight projects funded in part by *ConnectOregon* and its predecessor programs include Class I and short-line rail improvements, T-6 cranes and wharf improvements, improvements to other Oregon ports, and private rail intermodal facilities.

k. Trade and Transportation Education

Education about the importance of trade and transportation to the Oregon economy and the nature of challenges faced by Oregon shippers is envisioned as an integral part of the Trade and Logistics Initiative. Education for public officials, stakeholders, and the general public is complementary to ongoing stakeholder engagement efforts. While the Steering Committee, Oregon Trucking Associations, Oregon Freight Advisory Committee, Oregon Rail Users League, and other organizations each have education and communications functions, stakeholder forum participants perceived a deficiency in trade and transportation awareness among elected officials and government policymakers.

OTHER TRADE AND LOGISTICS PROPOSALS

The Tioga Group determined that some of the proposals reviewed did not have a direct public agency role, would not address near-term problems, or did not appear to be feasible based on current industry conditions.

a. Container Availability Information System

Stakeholders have expressed frustration over periodic shortages of specific container types in peak demand periods and the difficulty of compiling information from multiple sources. There have been suggestions for a “clearinghouse” for container availability information.

A consolidated information source for container availability information does not appear feasible in the near term. Each ocean carrier controls its own container supply and they do not exchange either the information or the container themselves. In all cases, customers must contact the carrier involved to locate empty containers for export loads.

b. Additional Rail Service Capacity

Stakeholders have expressed concern over rail capacity, but it is not clear that any rail capacity shortage is adversely affecting Oregon shippers. Additional rail service capacity could be relevant in two applications: additional capacity for NWCS service between Portland and Puget Sound

ports, or additional capacity for new service from new rail intermodal facilities. Public agency influence over rail capacity or use of that capacity, however, is very limited. Freight railroads generally have excellent access to capital and a long record of providing the capacity they need for profitable traffic. Railroads are reluctant to provide capacity for low-volume, low-margin business, even if they have reserve capacity available. Any new rail intermodal service would require separate negotiations with either Union Pacific or Burlington Northern Santa Fe, as appropriate.

c. Other Oregon Deep-Draft Ports

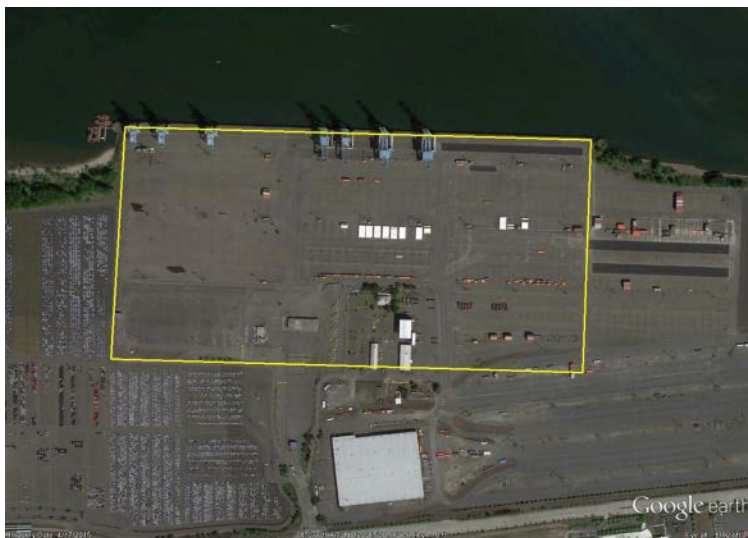
Stakeholders have asked whether other Oregon deep-draft ports could support container services to supplement or replace the services suspended at the Port of Portland. The Tioga Group determined the basic requirements of a container port and then reviewed the status and plans of four other Oregon deep-draft ports.

Container Terminal Requirements. Modern container terminals capable of serving the large vessels in TransPacific trades have a few basic requirements.

- **Water depth.** The largest vessels now in use may require 50-foot deep channels and berths. Depths of 40-45 feet are minimums for handling smaller vessels. The Columbia River navigation channel was deepened to 43 feet in 2007.
- **Terminal size.** Modern container terminals are generally 100+ acres, with older 50-100 acre legacy terminals considered small and vulnerable to congestion. The newest terminals being built are typically 300+ acres.
- **Berth length.** Modern vessels require berths of 1,000-1,500 linear feet. Most terminals have at least two berths.
- **Container cranes.** Container ships are served by at least two cranes each and as many as five. The shoreside cranes cost roughly \$10 million each.
- **Container handling equipment.** The container yard requires multiple lift machines at \$500,000–\$2 million each, as well as yard tractors and chassis.
- **Truck access.** The high truck volumes moving in and out of container terminals, especially when vessels are at berth, require road and highway connections capable of handling both the volume and the weight.
- **Rail access.** Fully competitive marine container terminals require rail access, either on-dock (as at T-6 and many Puget Sound terminals) or near-dock (as at Oakland). Efficient mainline connections are also required to handle intermodal trains with clearances for double-stack rail cars.

Port of Portland Terminal 6. Portland's T-6 is a multi-use facility covering over 400 acres. The primary container yard area (Exhibit 2) covers about 90 acres. With the adjacent on-dock rail yard and other areas, the container portion of T-6 totals roughly 200 acres.

Exhibit 2: Port of Portland Terminal 6



T-6 has three berths served by seven cranes. Water depth is 43 feet at two berths and 40 feet at the third. The Port has estimated T-6 capacity at roughly 700,000 annual twenty-foot equivalent units (TEU), equivalent to about 400,000 annual containers. The Port's 2014 volume was about 25% of that capacity.

Port of Coos Bay. The Port of Coos Bay has four privately owned ocean cargo terminals, two handling wood chip exports and two handling log exports. Although Coos Bay was reportedly considered as a site for a new container terminal at one time, container service is not part of the Port of Coos Bay's near-term strategy. A Canadian firm, Veresen, is currently seeking to develop a liquefied natural gas (LNG) export terminal at Jordan Cove in Coos Bay. The Port of Coos Bay is also pursuing a U.S. Army Corps of Engineers project to deepen the harbor channel from 37 to 45 feet.

Coos Bay is linked to the Southern Willamette Valley by Highways 38 and 42, which are not major truck routes. Coos Bay is about 110 miles from Eugene and 175 miles from Salem. Trucking to Coos Bay from the upper Willamette Valley might be less efficient than trucking to Tacoma. The Coos Bay Rail Link is a former Southern Pacific branch line connecting the Port with the Union Pacific main line in Eugene. The Port of Coos Bay acquired the Coos Bay Rail Link in 2010.

Port of Newport. The Port of Newport is in the process of upgrading its cargo facilities. The current Newport International Terminal is a multi-use cargo and commercial fishing facility. The Newport entrance channel is dredged to 40 feet, although berth depth at the International Terminal at present is 25-34 feet. The Port of Newport is developing a 9-acre facility for agricultural exports and inbound waste paper from Southern California by barge. The overall project cost is estimated at \$6.5 million and the Port recently received a \$2 million U.S. Department of Transportation, Transportation Investment Generating Economic Recovery (TIGER) grant to support the project. The Port intends to lease the barge terminal to a private operator. Newport's 2013 Strategic Business Plan identifies market opportunities for the new terminal in forest products, commercial fishing, and waste paper. The plan focuses on barge and short-sea shipping and does not discuss containerized trade.

Newport is connected to the Willamette Valley by Highway 20, which is not a heavy-duty truck route. Newport is about 90 miles from Salem. There is no rail service to Newport.

Port of Astoria. The Port of Astoria is on the Columbia River west of Portland, and currently handles cruise ships and export logs. Astoria’s 7-acre Pier 1 has two berths of 1,000 feet and 1,100 feet, with 38-40 feet of water depth. Astoria’s 2010 Strategic Plan focuses on managing existing infrastructure, maintaining deep-draft terminal capabilities, and developing available property into a “self-supporting marine industrial facility”. Cargo growth opportunities focus on forest products.

The Port of Astoria has good road connections, but rail freight service was discontinued over the former Portland & Western branch line after a landslide in the mid-1990s.

Port of St. Helens. The Port of St. Helens is actually nine different locations in Columbia County covering 2,400 acres. The St. Helens deep-draft terminal is Port Westward, a 1,700 acre site northeast of Clatskanie accessed by local roads and a Portland & Western rail spur. The existing dock is 1,200 feet and has 60+ feet of water alongside.

The Port of St. Helens Strategic Plan views Port Westward as a prime industrial and marine development site capable of supporting “energy and bulk commodities and trans-shipping facilities including rail and barge-to-ship transfers”. The Strategic Plan does not discuss containerized trade.

Container service capabilities. The other Oregon deep-draft ports do not have the capability to handle significant volumes of containerized trade and would not be able to develop that capability in the near future.

- Developing a container terminal at one of these ports would involve large-scale fill, dredging, serious environmental issues, and investments likely to exceed \$100 million.
- These ports are pursuing strategic business plans that target other kinds of shipping facilities and other commodities.
- Development of a new container terminal at one of these ports would likely take at least 7-10 years, if possible at all.

It is highly unlikely that major containerized ocean carriers would call at one of the other Oregon deep-draft ports. There is no current shortage of container terminal capacity for Oregon trade. T-6 at Portland has been operating well below capacity in recent years. The Ports of Seattle and Tacoma have reserve capacity at present and are expanding for future growth.

Where other Oregon deep-draft ports may be able to help Oregon shippers is in the bulk and semi-bulk trades on which their business plans are focused. Oregon forest and agricultural shippers need bulk and semi-bulk terminals for commodities and volumes that are not suited to containers. However, there have been instances reported in which Oregon exporters have temporarily shifted some commodities from containerized to bulk services.

III. Business Cases

Purpose

The Tioga Group developed preliminary business cases for six proposed freight logistics projects with:

- 1) a clear need and benefit to Oregon shippers
- 2) a well-defined and viable public agency role
- 3) technical, economic and operational feasibility, and
- 4) costs and next steps.

1. Port Trucker Information System

Overview

The Port Trucker Information System proposal responds to concerns raised in public forums and interviews over the difficulties experienced by Oregon truckers serving Puget Sound ports. Trucking firms and their drivers pursue efficiency but can be frustrated by congestion, delays, detours, and stoppages on port approach routes and port-area roads. Few ports enjoy an exclusive port road network; most share surface streets and highways with their host cities. When the highways become congested, as does Interstate 5 near Tacoma, the terms on which port drivers must share the network can be extremely constrained. Issues include:

- Turn times at Tacoma and Seattle terminals.
- Terminal gate hours and procedures.
- Vessel schedules and status, earliest receiving dates, and cutoffs.
- Traffic conditions on I-5 and on terminal access roads.

Stakeholders suggested the creation of an information system (a “clearinghouse”) to aggregate and make available current information on these and related topics. There are a number of precedents for efforts of this kind in the form of trucker information systems at many U.S. ports. The Tioga group recently completed a study on the topic available from the Asia Pacific Gateway Skills Table at: <http://apgst.ca/projects/pdfs/APG-Real-Time-Study-2016.pdf>.

Benefits

The immediate beneficiaries of better information for port truckers would be truck drivers and trucking firms. At an average operating cost of about \$28 per hour plus \$.95 per mile, the savings due to efficiency can be substantial. Time savings are particularly important because reducing the time required for each trip frees up limited driver hours for additional trips.

The secondary beneficiaries would be Oregon importers and exporters that rely on trucking – which is virtually all importers and exporters. At a minimum, Oregon shippers use trucks between their location and the NWCS terminal in Portland. At a maximum, Oregon shippers use trucks to move containers hundreds of miles to the ports of Tacoma and Seattle.

The Tioga Group identified five types of information that could be provided in port communications systems for motor carriers:

- Traffic conditions on port-area roads.
- Traffic conditions on local/regional routes to/from the port terminals.
- Traffic incident alerts on either port-area roads or approaches.
- Planned closures, repairs, or restrictions on either port-area roads or approaches.
- Port terminal conditions, incidents, or alerts.

Reliable, timely information regarding current or expected traffic conditions can be a useful tool for drayage firms seeking efficiency. Such information will let trucking companies and their drivers make better decisions on:

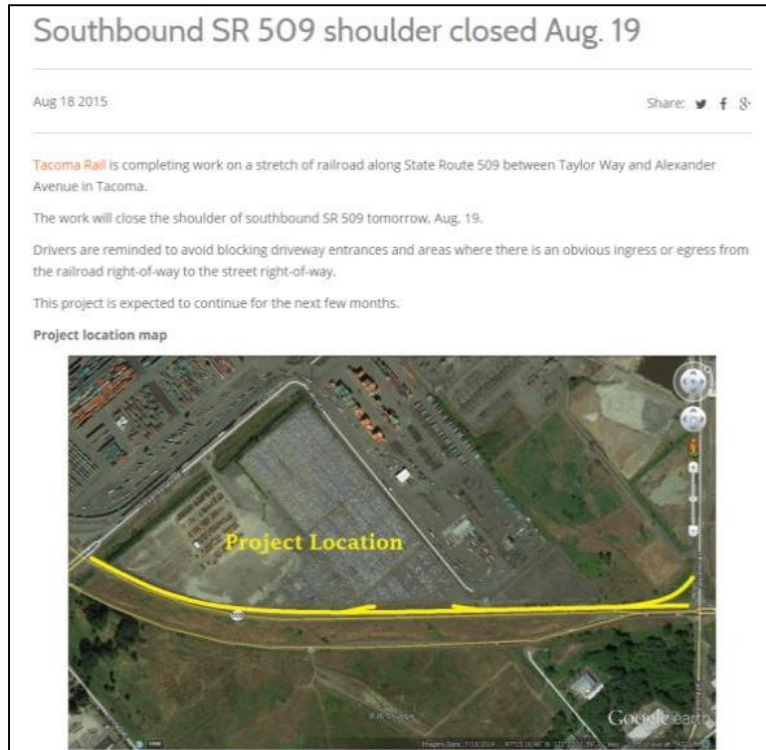
- When to go to which port terminal, and for what purpose.
- What route to use in each direction.
- How to combine trip legs in the most efficient multi-stop trip.
- How much time to allow.

Comparable Port Trucker Information Systems

As a result of research for the Asia Pacific Gateway Skills Table in Vancouver, The Tioga Group has established that several U.S. ports have trucker information systems of various kinds. The Northwest Seaport Alliance system is a relevant, and one with which an Oregon system might be coordinated. The Northwest Seaport Alliance (NWSA) was recently formed by merging functions of the ports of Seattle and Tacoma. The Port of Tacoma has taken the lead in traffic information communications. The majority of Port of Tacoma communications relate to the roadways within the port complex. Terminal operators handle specific communications regarding traffic levels and incidents on their facilities. Other port communications cover changes in port schedules and occasionally highway incident or accident information outside the port complex. The Port of Tacoma communications project was motivated by confusion and congestion that resulted when changes in the terminal operations brought a large number of new, unfamiliar drivers into the port, likely including drivers that formerly served Portland. Of particular concern are occasions when railroad operations block port roads, sometimes for extended periods. An immediate Port of Tacoma goal is to gain and communicate advance notice of upcoming rail crossing conflicts. The Port would also like to be able to create a variable message sign system that would communicate these matters as well as current queue times at marine terminals.

The Port of Tacoma messages are tweeted, emailed, and texted to a list of 1,200 subscribers. An example is provided in Exhibit 3. The Port of Tacoma uses GovDelivery (www.govdelivery.com), a communications platform designed for public agencies.

Exhibit 3: Sample Port of Tacoma Webpage Posting



<https://www.nwseaportalliance.com/operations/trucks>

The Port of Tacoma website also provides terminal information, updated twice weekly, at <https://www.nwseaportalliance.com/operations/terminal-updates>.

Operations staff monitors traffic advisories of the Washington Department of Transportation (WADOT) as well, and repeat those postings as warranted. Determining the frequency and content of driver communications is one of several job duties assigned to an individual in the Port of Tacoma operations department.

Port Truck Information System Options

In planning a port traffic communications system, a key question to be addressed is how recipients will use the information. Information on lane closures due to accidents may lead truckers to delay trips or take alternate routes, or allow more time until the lanes are reopened. Information on a month-long port-area road construction project, in contrast, may lead truckers to change operating plans for the duration.

Most communication methods used in port traffic alert systems have little or no incremental cost. With the exception of website posts, these are all “push” options that do not require recipients to look for messages.

- Twitter is free and accessible to anyone with a smartphone, but is limited in message length and complexity.
- Short Message Service (SMS) texting is free, and can accommodate complex messages, links, and graphics, and is accessible to anyone with a smartphone.

- Email is free and can be received via smartphone, tablet, or computer. Email can accommodate the most complex messages, including pre-formatted reports.
- Website postings are low cost, but may require involvement of staff with technical knowledge and system access. Website postings, however, are not a “push” option, and require users to check the website.
- eModal provides a third-party portal for email messages, relieving the sender of the need to manage email lists. eModal requires both the sender and receiver to sign up (for free).

The effectiveness of Twitter, SMS texting, and email depends on how well the message is crafted and on how completely the system covers the stakeholder audience. SMS texting and emails both require the recipient to provide contact information, but that process can be easily managed online, via text, or via email.

Costs

There are a few basic cost factors in port truck information systems. Most of the port systems in use make extensive use of existing resources. For example:

- The Port of Tacoma system monitors Washington State Department of Transportation bulletins.
- The Oakland system uses existing sources for vessel information, and webcams originally installed for security use.

It appears possible to initiate a system with little or no capital investment in data collection.

Port staff time required to operate the communications system varies with the scope of the system and the effort required to collect the information. Generally speaking, the staff time commitment is in collecting and monitoring traffic information, and is often less than one full-time equivalent (FTE).

The costs of communicating via Twitter, SMS text, or email are essentially zero, as is the cost of posting messages on an existing port website. Some email management and distribution systems (e.g., GovDelivery, Constant Contact) have additional costs, but are not likely needed for traffic communications alone.

Potential Public Agency Role

The Oregon Department of Transportation (ODOT), Port of Portland, or another sponsoring agency could follow the example of other U.S. ports by assembling information from the Puget Sound ports, ODOT, WADOT, and other sources and disseminating it to truckers and other interested parties.

Port traffic communications systems are scalable and highly adaptable to circumstances. The wide range of systems in place and the commonality of their basic elements suggests that the public agency could easily start with a modest, low-cost system and expand as dictated by needs and resources. It is clearly feasible for ODOT or the Port of Portland to start a traffic alert or information system with readily available, real-time information from other organizations. The

Port of Oakland is particularly proactive in supplementing typical information sources with daily staff observations and vessel data to produce a daily status report for motor carriers and real-time updates as required.

On a small scale, a Twitter-based or SMS text system could be started by any port staff member with a smartphone and access to existing traffic information sources. The Tioga Group has also identified blogs and Yahoo! groups that are used to exchange traffic and terminal observations between drivers, an even less formal arrangement. Once a message has been composed, it is relatively easy to send versions simultaneously via email, SMS text, and Twitter. There is virtually no incremental cost beyond staff time.

Next Steps

A port trucker information system should be part of the Trade and Logistics Initiative. The financial commitment can be relatively small; there is a well-defined public role, useful precedents and best practices are available; and the implementation time can be very short. The low cost and level of effort to start a modest traffic information system for port truckers also means that it can be scaled back or discontinued with minimal repercussions if not successful.

The immediate need for Oregon truckers is for information on the drayage move to and from Tacoma and Seattle. The information required has multiple available sources:

- Traffic conditions in Portland (sources: ODOT Trip Check, KOIN.com Interactive Traffic Map, Oregon Live.com Road Report)
- Traffic conditions on Interstate 5 (sources: ODOT Trip Check, WaDOT Traffic Advisories, WaDOT Traffic Cameras)
- Traffic conditions in Tacoma (sources: WaDOT Tacoma Traffic Cameras, WaDOT Tacoma Traffic Tweets, MyNorthwest.com traffic maps and alerts)
- Port of Tacoma road and terminal conditions (sources: NWSA Tweets, terminal websites, terminal webcams, NWSA website posts)
- Traffic conditions in Seattle (sources: WaDOT Seattle traffic cameras, MyNorthwest.com traffic maps and alerts, WaDOT Seattle Traffic Tweets, Seattle.gov Traffic website)
- Port of Seattle road and terminal conditions (sources: Seattle.gov Traffic website, terminal websites, terminal webcams)

Oregon truckers and their customers could also benefit from information regarding the monthly Westwood calls at T-6, and from information on the status of NWCS terminal and rail services. When weekly vessel calls return to Portland, the system can add information on T-6 terminal conditions and vessel status.

A port trucker information system could be established by ODOT, the Port of Portland, or a private organization such as the Oregon Trucking Associations. Costs would consist primarily of staff time, estimated at about 0.5 full time equivalents at the outset.

2. Truck Driver Training

Overview

The Oregon trucking industry, specifically the port drayage sector, is handicapped by a persistent driver shortage. The Oregon situation is part of a nationwide problem that is projected to worsen in the coming years. An October 2015 report by the American Trucking Associations (ATA) predicted a worsening national truck driver shortage. Annual turnover at large firms remains near 100%. The industry is losing qualified drivers through retirement. The median age for over-the-road drivers is 49.

The longer distances and times required to serve Tacoma and Seattle ports while weekly vessel calls are suspended at Portland greatly reduce driver productivity and compound the driver shortage impact on Oregon shippers. Reducing that shortage by training additional truck drivers would benefit Oregon shippers by adding critical capacity to the trucking industry.

A second aspect of training is driver familiarity with port container terminals. Picking up or delivering a container to a marine terminal is a complex multi-step process in a potentially hazardous environment. Terminals have strict safety rules and procedural steps, and they vary between terminals. New drivers often encounter delay due to unfamiliarity. This barrier can be largely overcome by proactive terminal-specific briefings and familiarity trips.

Benefits

Efforts to expand the truck driver labor pool by training new drivers would have multiple benefits:

- Adding capacity to serve Oregon exporters and importers.
- Adding jobs, particularly in rural areas.
- Creating a new generation of well-trained truck drivers.

The benefits of a large Oregon truck driver labor pool will flow to Oregon trucking companies and their customers. There is no guarantee that new drivers will enter the port drayage sector, but that sector recruits from the same overall pool of eligible drivers. Even if drivers do not gravitate to port drayage, Oregon shippers will benefit from greater overall truck industry capacity.

There will be specific benefits to Oregon shippers from increased driver familiarization with port container terminals. As documented in multiple studies, a large portion of port terminal delays is attributable to “trouble tickets” caused, in turn, by processing and documentation failures. Reducing these problems will reduce delays and improve reliability.

Requirements

Driver Training. Companies need trained, accident-free, and drug-free applicants with Commercial Driver’s Licenses (CDLs). Becoming a commercial truck driver requires training and licensing. Training can be obtained through a commercial truck driving school, a community college offering a truck driving program, or a trucking company that offers an in-house training program. The training typically consists of hands-on skills, safety instruction, and rules instruction

to enable the student to pass the Department of Motor Vehicles (DMV) tests for a Commercial Driver's License.

Costs of training programs are reportedly \$3,000-\$10,000 at private truck driving schools and \$2,000-\$5,000 at community colleges. Oregon DMV CDL and skills testing fees can total \$100-\$150, depending on which combination of tests is required.

The Tioga Group located several private truck driving schools in Oregon and two community college programs. Many of the larger trucking firms run their own driver schools – an unrealistic option for the small trucking firms that usually provide port drayage.

Driver Age. Federal rules effectively require port drayage truck drivers to be at least 21 years old. Drivers 18-20 years old can operate trucks within state boundaries, but cannot drive in interstate trips. International trade, specifically marine container movements, is regarded for this purpose as inherently interstate, preventing younger drivers from hauling international containers.

Insurers and company rules normally require new drivers to have at least two years of truck driving experience (presumably in smaller or non-commercial trucks), making 23 the effective minimum age. These rules and practices prevent a large cohort of young high school and community college graduates from driving commercial trucks. Once these potential candidates have found other jobs, they are less likely to ever become truck drivers.

Terminal Familiarity. The Port of Tacoma provides some driver information on the Northwest Seaport Alliance website, including an “onboard list” of terminal requirements and a downloadable Facilities Guide. While useful, these are not substitutes for working knowledge.

Existing Efforts and Status

There is an Oregon Truck Driver Tuition Loan Program administered by a partnership of the Oregon Trucking Associations (OTA) and Worksystems, Inc. The program is funded through a \$386,000 revolving loan fund authorized by the Oregon State Legislature. Worksystems, Inc. charges a loan fee of \$50, the only administrative expense. The loan fund and administrative costs are repaid by borrowers. There is no recurring cost to Oregon taxpayers.

The program originated with a \$1.2 million U.S. Department of Labor grant used to develop a driver training curriculum at Clackamas Community College. The Professional Truck Driver Certification (PTDC) curriculum was created in association with OTA, trucking firms, and insurers. A key feature of the program was an agreement by insurers to accept and cover drivers who had completed the curriculum in lieu of having two years of truck driving experience. OTA continues to cooperate with Clackamas Community College in “train the driver” programs to certify teachers.

Students attending a school using the PTDC program can borrow up to \$3,000 at 10% interest rates. There are limitations, however. There can only be two loans given per training course at each school site.

The loan program began processing applications in December 2012. To date, the program has received 187 loan application totaling \$440,500 against a loan fund total of \$386,000. The program has funded 168 loans. Six loans have been repaid and 117 are active, for a total of 123 applicants

that are presumably now driving trucks (about 67% of those that applied received a loan). The program's current 117 loans average of \$2,600 each. That is an average of about 46 new drivers annually – a very small part of the gap to be closed.

As of August 2015, the tuition loan fund is currently oversubscribed, and with a balance of under \$50,000, cannot make any new loans. The loans repay an average of \$84 per month, and some are delinquent, so repayment to the loan fund averages \$6,000–\$10,000 per month. At that rate, the fund will not be able to make new loans for several months. Worksystems, Inc. anticipated processing applications again in January 2016.

Tuition and fees at community colleges typically total \$3,800-\$3,900, and the average loan covers about 67% of community college tuition. Private trucking school fees are higher. The cost of community college could decline under Oregon Senate Bill 81, the “Oregon Promise”, signed by Governor Brown in July 2015. That program is meant to offset tuition not covered by any other state/federal grants.

The driver shortage is industry-wide, and most graduates of the program initially take jobs with major long-haul motor carriers that can offer signing bonuses and will sometimes repay the tuition loan. The long hours and time away from home leads to the high turnover. Port drayage firms often recruit former long-haul drivers that prefer to remain local.

Legislation to allow states to lower the age for a commercial, interstate license to 18 years old was introduced in Congress in 2015. The measure would have allowed contiguous states that join together in "compacts" to drop the age threshold to 18 for interstate trips. Under the proposal, states and the U.S. Department of Transportation would also be allowed to impose other restrictions. These provisions were dropped from the federal Fixing America's Surface Transportation (FAST) Act passed in late 2015. The State may wish to see these efforts restarted with a view towards easing the persistent truck driver shortage.

The Western States Transportation Alliance (WSTA) has proposed a state-authorized “pathway” for 18-20 year-olds to enter the truck driving workforce. Features include:

- Specific training for CDL qualification,
- Distance and mentoring options for younger drivers, and
- Tracking of young driver performance.

Potential Public Agency Role

A jobs training and placement program to expand the number of Oregon truck drivers could take multiple forms:

- An expanded Truck Driver Tuition Loan Program.
- Expanded community college programs and outreach efforts, building on the “Oregon Promise” program.
- Reduced Department of Motor Vehicle fees for Commercial Driver's License (CDL) tests and upgrades.

- Joint training and recruitment efforts with the OTA, the Port of Portland, or selected trucking companies.
- Selective support for relaxed age restrictions.
- Increased training and familiarization opportunities for Puget Sound marine terminals.

Next Steps

An expanded truck driver training and recruitment program would be a logical component of the Trade and Logistics Initiative, with a well-defined public agency role. There is an existing tuition loan program that is contributing to the solution, but is under-funded. Recapitalizing the revolving fund would be a one-time expenditure that would add to the pool of trained truck drivers indefinitely.

The simplest approach would be to expand the current driver training loan program by increasing the revolving loan fund. The loans take 36 months to repay, and a new loan cannot be made until enough payments have been made to replenish the revolving fund after about 30 months. Each \$2,600 in the fund will generate a new loan, and a new trained driver, every 30 months. To train 100 new drivers each year, the existing \$386,000 fund would need to be increased to roughly \$839,000 – an addition of \$453,000.

Developing truck driver training programs at other community colleges may also be feasible, but would have a longer lead time. There may also be a potential role for Business Oregon in assisting the port trucking industry with recruitment and retention.

Potential risks include low driver retention after training or migration to other trucking sectors. Like most job training programs, a truck driver training program will increase the pool of variable drivers, but the drayage sector must still attract them to port trucking.

The Puget Sound ports could be approached by the Port of Portland, ODOT, Business Oregon, or the OTA to organize training and briefings for Oregon drayage drivers. The actual training would be conducted by individual terminal operators.

3. Satellite Container Yards

Overview

A number of workshop participants and other stakeholders see an opportunity and need to establish container yards or depots to serve Oregon importers and exporters outside the Port of Portland itself. These “satellite” yards could include storage and supply depots for empty containers; trucker drop lots for staging containers on chassis; “dray-off” yards for interchanging containers between over-the road and locally drivers; or “inland ports” that function as extensions of marine terminals. The two major issues in satellite depot/drop lot/dray-off projects are:

- Function – should the facility offer empty container supply and returns, loaded container handling, equipment interchange, or some combination?

- Location – should the facility be located in Portland, elsewhere in Oregon, or near the Ports of Tacoma or Seattle?

Benefits

These “satellite yards” could address several goals:

- Facilitating relay operations to mitigate hours of service (HOS) limitations on long truck moves;
- Enabling “dray-off” operations to separate long-haul highway moves from local port terminal trips;
- Improving the supply of empty containers for Oregon exporters;
- Improving the supply of standard and heavy duty chassis for Oregon truckers and customers; and
- Facilitating reuse of empty import containers for export loads.

Requirements

Empty Container Supply and Return. As a rule, empty import containers are returned to the marine terminal where the import load was picked up. Empty export containers are obtained from the terminal where the export load will be delivered. This practice has been modified where vessel sharing agreements (VSAs) lead ocean carriers to spread their activity over multiple terminals. Empty sourcing and return processes then become complex, and result in higher trucking costs and longer trucker turn times.

Most container ports have empty container depots nearby. These depots are usually operated by independent firms and their primary purpose is off-terminal storage of empty containers.

The ability of truckers to obtain and return empty containers at an off-terminal depot of any kind depends on ocean carrier authorization. Where port terminals remain the default supply and return points (as at Portland, Seattle, and Tacoma), explicit authorization is needed to obtain or return an empty at an off-terminal depot. Ocean carriers usually only give such permission when the terminal itself is short on container supply or storage space, or when the ocean carrier is obtaining (“on-hiring”) or returning (“off-hiring”) a leased container at the depot.

Wheeled versus Stacked Container Yards. “Wheeled” container yards or drop lots at which containers remain on chassis do not require lift equipment or lift equipment operators. These lots can have simple gravel surfaces and may not even be fenced if loaded containers are not parked there. There may or may not be regular personnel on site, and there may be no need for structures, or electrical power.

Stacked container yards at which containers are separated from their chassis require more infrastructure and operations expense.

- Stacked empty container storage requires a paved surface to properly support the containers and bear the weight.

- Stacking requires lift equipment. Empties can be handled with heavy-duty fork lifts, reach-stackers, or side-loaders. Capital costs range from \$500,000 to \$1 million, and provisions must be made for fuel and maintenance (typically by mobile contractors).
- Stacked operations would typically require a staff of a least 3-4: a lift operator, a ground man, a clerk, and possibly a supervisor.
- A stacked operation would require fencing, an office structure, electric power, water, and sewer.
- If the stacked operation is also to serve as a chassis supply/return point, provisions will also be required for chassis inspection and maintenance (also typically by a mobile contractor).

These requirements overlap with those of rail intermodal facilities. Northwest Container Services (NWCS) in Portland takes advantage of this dual capability to offer deport services at its rail terminal.

Trucker Drop Lots. Trucker drop lots are basically parking lots for trucker convenience. Some large port truckers have their own yards for this purpose; others use vacant lots or street parking. Truckers can use drop lots to:

- Stage import loads for delivery to the customer in a particular time window or in a particular order.
- Stage export loads for delivery to the terminal at a particular time.
- Hold empty import containers for a convenient return trip or for possible re-use by export customers.
- Hold a supply of empty containers for export customers.

A company yard or drop lot enables the trucking firm to de-couple the trips to customers from the trips to port terminals. The trucker can pull import loads from the port on one day and deliver them to the customer the next day, or the reverse for exports. This capability is particularly useful in cases where importers and exporters are long distances from the port, as in parts of Oregon. A trucker that pulls an export load from the shipper in mid-afternoon, for example, may not be able to deliver that load to the port terminal within normal gate hours in the same day.

Drop lots and company yards are usually used by just one trucking company as there are no routine provisions for interchanging containers or chassis between truckers. Any interchange, either to deliver a load or re-use an empty, usually requires special arrangement. Holding loaded containers at a drop lot or company yard requires a secure location with fencing, lighting, and security personnel. For this reason, truckers usually hold loads only at company yards, not at off-site drop lots.

Dray-Off Yards. The “dray off” concept refers to the practice of splitting port drayage into two segments:

- The long-haul segment between the port area and the customer, and

- A short shuttle move within the port area.

The “dray off” yard is the point at which the container on chassis is exchanged between the two drivers and tractors.

Many truckers with company terminals near a port use their own facilities as dray-off yards. These companies may split their work force into one group to handle port shuttles during terminal gate hours and another group that can then operate 24/7 as required to serve customer locations. Some port-area truckers also sub-contract to provide port terminal service for long-haul truckers, with the exchange taking place at the port trucker’s yard.

The only multi-user dray-off yard known to The Tioga Group is the one operated at the San Pedro Bay ports by TTSI (a trucker) and Pasha (a terminal operator), working with Cargomatic (a software systems provider). At this facility, TTSI operates shuttle trips to and from the marine terminals and over-the-road (OTR) truckers interchange containers on chassis to serve major importers. Containers from pre-approved importers are discharged from the vessel and block-stored at the marine terminal. When a sufficient block is formed, TTSI truckers are dispatched to the marine terminal where the equipment operator “peels off” the containers without regard to consignee. The participating parties are pre-approved, equipment interchange agreements have been signed, and the ILWU provides a gate clerk and mechanic for the near-dock yard operated by Pasha Stevedoring. Truckers dray the containers to the near-dock site operated by Pasha. Either TTSI truckers or truckers dispatched by customers pick up the containers at the near-dock yard and transport them to their destinations.

Satellite Yards for Loads. Off-terminal facilities for loaded containers are very uncommon. Handling import and export loads at a satellite terminal faces significant institutional obstacles. The operator must receive and accept responsibility for the contents of the container as well as the container itself, and in doing so, effectively becomes the ocean carrier’s representative.

Increased interest in these concepts has resulted in a number of related developments:

- NWCS in Portland is linked to Seattle and Tacoma by rail.
- The Virginia Inland Port (VIP) at Front Royal, Virginia, is linked to the Port of Virginia by rail.
- South Carolina Port Authority (Port of Charleston) has opened a rail-served “inland port” at Greer (212 miles away).
- The Port of Wilmington, North Carolina has a truck-served satellite terminal at Charlotte Island and a rail/truck terminal at Piedmont Triad (Greensboro).
- Georgia Ports Authority (Port of Savannah) and Cordele Intermodal Services (a private 3PL) have established a 40-acre, rail-served inland port at Cordele, Georgia (200 miles away).

These facilities are linked to marine terminals by truck or rail and typically accept and deliver import and export loads and empties on behalf of the ocean carrier, thus operating in the same fashion as a port container terminal. The rail or transportation may be included in the ocean carrier rate.

Existing Efforts and Status

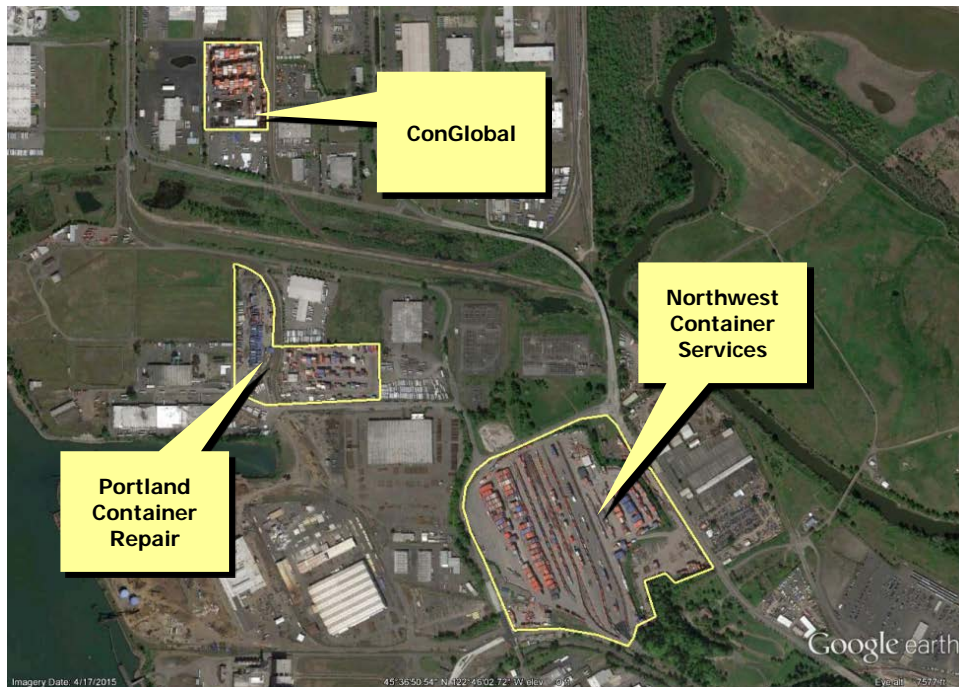
The demand for additional satellite yard capacity and functions is not yet clear. These facilities have been proposed as ways for Oregon importers, exporters, and truckers to cope with the difficulties of using the Ports of Tacoma and Seattle instead of Portland T-6.

The usefulness of drop-off yards in resolving truck driver hours of service issues is clear, and The Tioga Group has been told that some companies are using Tacoma-area drop yards for that purpose already.

Better container supply for exporters is always desirable, but establishing more depots will not resolve the problem unless the container owners – the ocean carries – choose to make supply available at those depots.

Most of the functions proposed for satellite locations are already provided in or near Portland. NWCS, ConGlobal, and Portland Container Repair (Exhibit 4) provide all of the services described above except loaded container dray-off. Portland Container Repair is currently being used for off-dock staging of export loads for Westwood, and in that sense is already functioning as a dray-off yard. Having these facilities can serve as a starting point for additional functions, initially without new capital investment. An important next step in evaluation will be to determine how much of the perceived need they can meet.

Exhibit 4: Port-Area Container Facilities



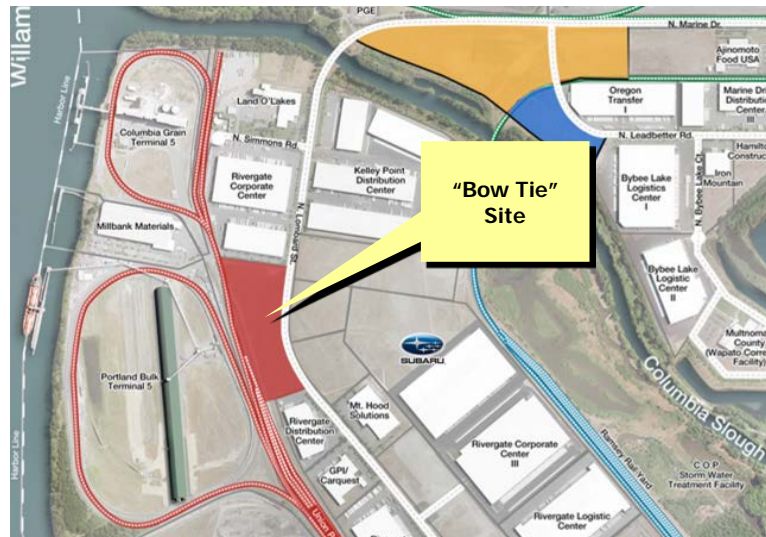
Location Options

Portland. The key advantages to locating new facilities or new capacity in Portland are: 1) anchoring cargo handling capability in Portland, and 2) taking advantage of Portland's mid-point location in the Interstate 5 corridor between the lower Willamette Valley and the Puget Sound ports.

The one example of a commercial multi-customer dray-off yard, the TTSI/Pasha facility, is located near the container terminals. An analogous effort in this case would be to put the facility near the Port of Tacoma, the Port of Seattle, or accessible to both. In this scenario, Oregon truckers would keep the over-the road movement between Tacoma and their Oregon customers, and a locally based trucker or driver would shuttle containers between the dray-off lot and the marine terminals.

The Port of Portland and other landowners in Portland also have sites available for the purpose. The Rivergate area “Bow Tie” property, shown in Exhibit 5, would be ideally suited for any of the functions discussed.

Exhibit 5: Port of Portland Rivergate Properties



Puget Sound. There are already container depots at ports of Tacoma and Seattle. NWCS has depots at both Puget Sound ports, and ConGlobal operates a large depot at Seattle. These depots offer basically the same functions as at Portland. These operations would be the logical starting points for additional functions and capacity, especially since two of the operators are already present at Portland.

The notion of a Tacoma-area or Seattle-area drop lot or dray-off yard appears to have been advanced primarily as a response to the long Puget Sound turn times in late 2014 and early 2015. Based on stakeholder interviews, those turn times have declined. The persistent source of delay is reportedly Interstate 5 congestion in and around Tacoma. A Tacoma-area drop lot or dray-off yard would not address the Interstate 5 congestion problem. Drivers from the lower Willamette Valley face a 400–500 mile round trip to Tacoma, which is right at ordinary hours of service limits. Significant Interstate 5 delay between Oregon and a Tacoma-area facility would frequently jeopardize the ability of a driver to complete the trip legally.

Moreover, a Tacoma or Seattle drop-lot or dray-off approach is essentially a Port of Portland bypass strategy, and may not be consistent with the state of Oregon’s long-term interests.

Willamette Valley. Some stakeholders also expressed an interest in a satellite facility in the Willamette Valley or elsewhere in Oregon. The proposed barge/rail linkage at Boardman effectively turns Boardman into a satellite terminal. Given the concentration of Oregon cargo

origins and destinations identified in the Phase 1 research report, the other potential service area is the Willamette Valley.

There has been specific interest in using the Lowe's Regional Distribution Center in Lebanon as a site for street turns. Representatives of Lowe's have reportedly expressed willingness to make their empty import containers available on-site for re-use by regional exporters. Such an initiative might serve as a starting point for routine re-use of import containers in the Willamette Valley, with potential long-term location at a regional drop lot or other third-party site.

Siting a satellite yard in the Willamette Valley, however, raises many of the same difficulties as a Puget Sound location. A location in Salem, for example, would be about 185 miles from Tacoma and 205 miles from Seattle, making single-day round trips unreliable. Moreover, a Willamette Valley location would still require Oregon trucker to negotiate the Puget Sound port terminals.

The idea of a satellite container yard in the Willamette Valley has been connected with the idea of a rail intermodal terminal there, and is addressed as a separate business case. If associated with a rail intermodal terminal, the availability of empty container supply and return capability there could facilitate some of the same economic advantages of NWCS in Portland by reducing the need to move empties by rail.

The Port of Oakland is cooperating with Shipper's Transport Express to establish a remote empty supply depot in California's Central Valley, about 63 miles from the Port. This inland depot is very comparable to the Oregon situation as it addresses the difficulty of making long round trips to the port within a single driver's HOS limits. The Port of Oakland hopes to achieve several objectives:

- Create a satellite start/stop location for empties and chassis,
- Reduce empty drays,
- Provide a "relief valve" for terminal and road congestion,
- Increase inland equipment supply, and
- Allow for future handling of import and export loads.

Potential Public Agency Role

Adding satellite container functions, capacity, and locations would be consistent with the roles of both Business Oregon and the Port of Portland. From the perspective of economic development, container depots and related facilities are industrial facilities and employers, fundamentally similar to other business types that the state of Oregon might wish to encourage. From the Port of Portland perspective, local container depots and related facilities are support functions and potential tenants for Port industrial land. Facilities at Puget Sound ports or in the Willamette Valley, however, could be pull cargo from T-6, making return of Portland container service more difficult.

Public agencies could encourage additional depot/drop lot/dray-off capacity, locations, and functions through:

- Assistance with land acquisition or leasing. The Port of Portland's Rivergate "bow tie" site would be one candidate if additional capacity is need in the Portland area.

- Conventional economic development tools, such as tax incentives or Enterprise Zone locations. These options would be useful to either establish new facilities or expand existing sites.
- Financial support for pilot programs.

Next Steps

Satellite depot/drop lot/dray-off concepts have significant promise, have been proposed by multiple stakeholders, and have a feasible public agency role. Consideration of such facilities should be part of the Trade and Logistics Initiative. There are precedents that can be analyzed to identify best practices and determine applicability for Oregon. The extent and nature of unmet need is still an open question, and might be usefully addressed as an ongoing part of the Trade and Logistics Initiative.

The facilities in question require minimal fixed investment beyond fencing, simple offices, and possibly paving. Any public involvement in fixed assets, therefore, should be modest. Lift equipment, when required, is more costly (e.g., \$500,000), but has significant resale value.

Beyond establishing unmet needs in more detail, steps by public agencies should be focused on facilitation of private sector freight logistics efforts. As there are private firms in these businesses already, there does not appear to be a need for competing public sector developments.

Given that many of the proposed functions are available at Portland-area facilities, it should be possible to phase-in additional capacity and functions rather than attempting to establish a new facility. A phased approach is inherently lower-risk, and would enable sponsors to adjust strategy and commitment.

4. New Rail Intermodal Services and Yards

Overview

Some stakeholders have suggested establishing additional rail intermodal services and yards in the Willamette Valley or elsewhere in Oregon. The goal would be to extend or supplement the Northwest Container Service (NWCS) from Portland and expand intermodal rail use, thus reducing the cost of accessing the Puget Sound ports and taking trucks off the highway. A new rail intermodal terminal could also serve as a container depot and supply point for Oregon exporters.

The primary stakeholder interest has been in a facility and service in the Willamette Valley. Possible points mentioned for a new rail intermodal terminal in the Willamette Valley include Albany, Springfield, Eugene, Lebanon, and Medford. NWCS was actively considering a Willamette Valley service in 2005–08. There has also been some interest in involving short line railroads (e.g., the Albany & Eastern) in intermodal terminal development.

Establishment of a new rail intermodal terminal in the Willamette Valley, however, faces some operational, economic, and institutional barriers. A standalone rail intermodal service over the short distances involved is expected to be more costly than truck service. Intermodal rail service in the Interstate 5 corridor requires the active participation of UP, which owns the lines. Railroads typically prefer long haul moves of 500 or more miles.

Existing Efforts and Status

Oregon currently has five rail intermodal facilities served by UP and BNSF railroads.

Port of Portland Terminal 6. The on-dock rail intermodal transfer capabilities of T-6 are currently idle pending resumption of weekly vessel service that could use those capabilities (Exhibit 6). This facility is accessible to both BNSF and UP.

Exhibit 6: Port of Portland T-6 Intermodal Terminal



NWCS Portland. The NWCS Portland terminal (pictured in Exhibit 7) is served by UP. In addition to transferring containers to and from rail cars, this facility serves as a container depot and a container maintenance and repair site. The site is about 90 acres.

Exhibit 7: NWCS Portland Intermodal Terminal



NWCS Boardman. The NWCS Boardman terminal (Exhibit 8) was developed as a joint effort between NWCS and the Port of Morrow, using funding from the federal government and ConnectOregon. Initial cost of the 15-acre facility was roughly \$10 million.

Exhibit 8: NWCS Boardman Intermodal Terminal



UP Portland. The UP (former Southern Pacific) terminal at Portland handles containers and trailers for UP’s regular intermodal services.

BNSF Portland. The BNSF (former Burlington Northern) terminal at Portland likewise handles containers and trailers for BNSF’s regular intermodal services.

Rail Intermodal Service Factors

A successful rail intermodal service in the Willamette valley or elsewhere will require a business model that brings together the volume, service, and cost factors below in a combination that is both more efficient than truck drayage and attractive to potential customers.

Volume

The potential container volume handled by rail intermodal service will not determine its economic feasibility, which is instead dictated by the business model. Volume does, however, help determine interest in such an initiative and the potential for public benefits. Volume also affects the scale economies of terminal and rail line-haul operation.

The large volumes needed for intermodal services are typically generated by large ports or population centers. Typical threshold values are population centers of a million or more or a port with 250,000 TEU (about 150,000 containers) or more. Occasionally very large, concentrated production centers will also produce enough volume to demand intermodal service. The Honda production complex in and around Marysville, Ohio near Columbus is an example.

Customers are understandably reluctant to commit important business to a start-up intermodal service without a performance record and with no guarantee of ongoing service. Service providers must have sufficient staying power to establish a service record with sub-optimal volumes. One critical element, especially at start-up, is one or more “anchor” customers willing and able to commit substantial business volumes. Many of the first double-stack container trains were established only after the ocean carrier customers provided long-term volume guarantees to the railroads.

Error! Reference source not found. shows identifiable Willamette Valley container volumes from 2014 Port Import-Export Reporting System customs data from the Journal of Commerce. These estimates may be somewhat conservative because actual origins and destinations cannot be identified for many third party shipments, and the allocation method used by The Tioga Group for Port of Portland cargo cannot be safely applied to Puget Sound trade data that lack usable location information. These data do, however, show the rough magnitude of container movements and the import/export balance by county.

Exhibit 9: Estimated 2014 Identifiable Container Volumes – Oregon Markets

Market	County	Est. Import Containers	Est. Export Containers	Est. Total Containers
Portland - North Willamette	Clackamas	13,868	5,088	18,956
Portland - North Willamette	Clatsop	88	258	345
Portland - North Willamette	Columbia	58	-	58
Portland - North Willamette	Multnomah	18,577	6,615	25,192
Portland - North Willamette	Tillamook	2	-	2
Portland - North Willamette	Washington	5,221	1,562	6,783
Portland - North Willamette	Yamhill	227	535	762
Portland - North Willamette	Subtotal	38,041	14,057	52,098
Middle Willamette	Benton	219	98	318
Middle Willamette	Lane	4,900	1,073	5,973
Middle Willamette	Lincoln	116	1,121	1,237
Middle Willamette	Linn	1,296	13,629	14,925
Middle Willamette	Marion	1,157	10,105	11,262
Middle Willamette	Polk	19	3,279	3,298
Middle Willamette	Subtotal	7,707	29,305	37,012
Southern Oregon	Coos	10	13	22
Southern Oregon	Curry	1	129	130
Southern Oregon	Douglas	187	115	302
Southern Oregon	Jackson	943	266	1,209
Southern Oregon	Josephine	67	-	67
Southern Oregon	Klamath	44	646	690
Southern Oregon	Subtotal	1,251	1,170	2,421
Central Oregon	Crook	3,731	-	3,731
Central Oregon	Deschutes	612	1	613
Central Oregon	Morrow	304	12,614	12,918
Central Oregon	Sherman	-	-	-
Central Oregon	Hood River	115	35	150
Central Oregon	Jefferson	423	30	453
Central Oregon	Wasco	21	6	26
Central Oregon	Wheeler	0	0	-
Central Oregon	Subtotal	5,205	12,686	17,891
Eastern Oregon	Baker	6	-	6
Eastern Oregon	Gilliam	-	-	-
Eastern Oregon	Grant	1	5	6
Eastern Oregon	Harney	0	-	0
Eastern Oregon	Lake	-	635	635
Eastern Oregon	Malheur	7	400	407
Eastern Oregon	Umatilla	348	364	712
Eastern Oregon	Union	1	-	1
Eastern Oregon	Wallowa	-	-	-
Eastern Oregon	Subtotal	363	1,404	1,767
Oregon	Total	52,567	58,623	111,190

- The largest concentration of containerized cargo is in the Portland-North Willamette area. These locations are generally within 50 miles of Portland and would probably be served by a Portland rail terminal (e.g., NWCS) rather than by a new terminal further south.
- The Middle Willamette Valley counties most accessible to a Lebanon terminal had an estimated identifiable total of about 37,312 containers in 2014, with an export/import ratio of 3.8 to 1.
- Southern Oregon had less container traffic in 2014, an estimated total of 2,421 containers about evenly balanced between imports and exports.
- The Central Oregon area had about 17,891 containers in 2014, with a 2.4 to 1 ratio of exports to imports. This volume is heavily influenced by Les Schwab imports in Prineville. The Morrow County trade is too far north to be accessible to a Willamette Valley service.

The markets surrounding a Lebanon terminal thus had a total of about 44,406 containers in 2014 (not counting Morrow County), about 2.2 to 1 in favor of exports. Based on industry interviews, around half of this total is being trucked to and from the NWCS terminal at Portland and the remainder trucked to and from the ports of Seattle and Tacoma.

Facilities and Equipment

Facilities. Rail, highway, customer and community needs and costs are all elements in selecting a terminal location. The typical location for an intermodal rail operation is at or near an existing rail yard, with good highway access, and with the closest possible proximity to shippers. Rail infrastructure and track needs to be provided for loading and storage areas for rail cars. Parking areas for containers, chassis, terminal equipment, and employees are also required. Terminals operate at times dictated by the needs of the market and the associated rail operation, which means they need to be well lighted and secured.

Railroads usually own their rail intermodal terminals, and are compensated for land and fixed investments through the profit margin on the rail service. The railroad customer pays the railroad for the combined terminal and line-haul services under a single rate; there are no separate lift or facility fees.

The existing Albany & Eastern transloading site in Lebanon has been mentioned as a possible beginning point for a rail intermodal terminal. Typical development costs for a site of this type would be in the neighborhood of \$10 million, comparable to the NWCS Boardman facility.

Terminal Equipment. Heavy-duty mobile lift equipment is required to transfer containers between truck chassis, ground storage, and rail cars. Small facilities can start out with one lift machine, perhaps used. As volume grows, a second machine is required for both capacity and reliability. Larger intermodal facilities have multiple lift machines. There are several different types of lift machines in use. Exhibit 10 shows a “reach stacker” recently acquired by NWCS.

Exhibit 10: NWCS Lift Equipment



Rail Car Supply. Rail cars are typically provided by the railroad. Rail cars are usually obtained from the TTX Company, a national pool owned by Class I rail carriers. TTX is paid by the railroads on a per-day and per-car-mile basisⁱ. Railroads also own some of their cars. To protect supply, sometimes stakeholders provide and control the rail cars. NWCS overcomes the car supply problem by owning or controlling most of its own cars (a substantial investment), and obtaining others from TTX as needed (Exhibit 11).

Exhibit 11: NWCS Double-Stack Car



Rail Service and Connections

Rail Service Roles. Rail intermodal service for international containers may involve multiple railroads. Most domestic intermodal service is provided exclusively by Class I railroads. International container service to and from ports may also involve port switching railroads. Short-line railroads have participated in intermodal service in a few cases.

ⁱ It is sometimes said, inaccurately, that railroads lease cars from TTX. TTX is a pool, not a leasing company.

- **Class I Railroad.** The railroad typically provides a combined terminal and line-haul service between points on its own lines or via interchange with another Class I or port switching railroad.
- **Port Switching Railroads.** Some ports have switching railroads that handle train movements between an interchange with the Class I railroad and the marine terminals or near-dock port terminals, such as Tacoma Rail at Tacoma. They typically charge for the service under a public tariff on a per-car basis. Tacoma Rail charges \$47 per railcar platform (usually two containers) to switch cars between the UP interchange and the South Intermodal Yard at Tacoma.
- **Short-Line Railroads.** Participation of short-line railroads can have both advantages and disadvantages. Potential advantages include: 1) the ability to locate the facility off the Class I main line and isolate it from traffic flow; 2) greater flexibility in operations; and 3) lower cost in some categories. Potential disadvantages include: 1) the complications of Class I/short-line interchanges; 2) possible limitations of short-line infrastructure; and 3) fewer opportunities to merge multiple flows and operations into a network.

Willamette Valley Options. The Lebanon site is served by the short-line Albany & Eastern railroad. The Albany & Eastern (A&E) connects with the Portland & Western (P&W), and the Portland & Western connects in turn to UP at the Albina Yard in Albany. BNSF operates between P&W and A&E under trackage rights agreement with UP. A Lebanon-Tacoma trip, therefore, would involve four railroads: A&E, P&W, UP (or conceivably BNSF), and Tacoma Rail. The UP/Tacoma Rail interchange is routine and a part of existing NWCS service. There are at least four conceivable intermodal operating options:

- **UP Hook and Haul Service.** It is technically possible for UP (or BNSF, over trackage rights) to provide locomotives and crew to move intermodal cars between a Willamette Valley facility and Portland or Tacoma. UP would have to operate over P&W and A&E for the purpose. This option would probably be uneconomical at start-up or while volumes remain low. The NWCS service at Portland operates in this manner. NWCS assembles the train and UP provides locomotives and crew to move the train between Portland, the interchange with Tacoma Rail, and Seattle. UP is not involved in loading or unloading the trains.
- **Short-Line/UP “Manifest” Service.** It is also possible for A&E/P&W to move the cars between Lebanon and Albany, and UP to move the cars as part of its regular railcar (“manifest”) train service to Portland or Tacoma. The A&E/P&W/UP multi-carrier interchange, however, would be highly unusual for rail intermodal service, and such an arrangement would likely be much slower than intermodal-only service. This option might be possible as an interim step, but would be inefficient in the long run.
- **UP “Block Swap” Service.** Existing or planned UP intermodal trains operating through the Willamette Valley (e.g., north-south service in the Interstate 5 Corridor) may be able to pick up northbound cars at Albina Yard and take them to Puget Sound, and drop off southbound cars from Puget Sound. P&W/A&E would then move the cars between Albany and Lebanon. The feasibility and efficiency of this

option would depend on the operating pattern of the existing or planned north-south trains.

- **P&W Trackage Rights Service.** P&W reportedly has trackage rights over UP between Albany and points in Portland close to the NWCS terminal. If agreements could be reached with UP to connect all the way between Albany and the NWCS terminal, and operate over A&E to Lebanon, P&W could operate intermodal trains directly from Lebanon to the NWCS terminal. At the NWCS terminal, the cars would be combined with regular NWCS trains.

Cost Factors

Rail intermodal services entail costs for local drayage, terminal lift, and line-haul rail operations. The combined cost usually must be less than the comparable trucking cost to attract business, as rail intermodal services are slower over short distances.

Drayage Costs. Customers currently draying containers between Willamette Valley locations and NWCS in Portland, the Port of Tacoma, or the Port of Seattle would dray containers to and from a Willamette Valley rail intermodal instead. The difference between the two drayage costs sets a ceiling on the price customers would be willing to pay for rail intermodal service.

Lift Costs. The terminal operator lifts the containers to and from rail cars. The operator often provides cranes and other equipment needed to perform those services, and charges the railroad on a per-lift basis. Most railroad intermodal terminals are operated under contract by companies such as Parsec, Intermodal Terminal Services, Pacific Rail Services, or Eagle Intermodal Services.

The size and scope of the facility is determined by anticipated volume, as shown in Exhibit 12. The minimum size is typically 10-20 acres. Terminal equipment is typically provided by the terminal owner or by a contract operator.

Exhibit 12: Typical Small Intermodal Terminal Features

Annual Lifts	<10,000	10,000- 20,000	20,000 - 30,000
Lift Machines (typical)	1 Used	1 New	2 New/Used
Size (Acres)	10	10-15	15-20
Labor FTE	2	3	4 to 6

Rail intermodal terminal operations have strong economies of scale. At a modest start-up volume of around 30,000 annual lifts, the contract operator's, would be at least \$50 per lift at present. Two lifts are required at each end of the trip, one on and one off. To obtain significant economies of scale, the volume would need to first triple, and then double. Such volumes are far beyond the reach of small intermodal facilities.

When ports provide on-dock or near-dock rail intermodal transfer facilities, there is a separate charge to the ocean carrier for terminal services. For example, the charge at Tacoma's South Intermodal Terminal is \$70.15 per container lifted on or off.

Rail Line-haul Costs. In previous studies, rail costing experts working with The Tioga Group estimated Class I operating costs in similar short-haul corridors at about \$1.00 per mile at 2015 cost levels. The rail distance from Albany and the Port of Tacoma is roughly 221 miles each way,

or 442 miles round trip, with a rail line-haul cost of \$442. P&W costs may be lower, but would include trackage rights payments to UP.

Port of Tacoma Rail Costs. The Port of Tacoma publishes a public tariff for container handling fees at its near-dock rail terminals. At the South Intermodal yard, for example, the fee is about \$70 per lift. There is also a Tacoma Rail switching fee equivalent to \$23.50 per container. Container handling fees at Tacoma would total about \$93.50 in each direction, or \$187 for an empty/load round trip, in the absence of any negotiated reductions. (The ocean carriers absorb the Tacoma lift fees for the current NWCS service from Portland.)

Business Model

A robust, pragmatic business model is a crucial factor in the success or failure of intermodal services. Rail intermodal service has substantial terminal costs for loading and unloading the trains, building and maintaining the terminals, and draying the containers between the rail terminals and their actual origins and destinations at the other end. These costs often amount to several hundred dollars on each move. Railroads have substantially lower unit line-haul costs than individual trucks. A double-stack container train can carry 300+ containers yet be operated by a crew of two. The inherent line-haul efficiency of rail technology likewise dramatically reduces unit fuel costs compared to trucks.

The railroad, however, must operate a large enough train over a long enough trip for those line-haul savings to offset the high initial terminal costs. The breakeven distance has usually been estimated somewhere in the 500-1,000 mile range with around 750 miles being a common ballpark figure.

At shorter distances, such as those between Oregon cities and the Puget Sound ports, rail intermodal service cannot ordinarily compete with trucking if customers bear the full round-trip costs. Success in these short-haul intermodal markets, therefore, depends on economic leverage or cost-sharing of some kind.

Conventional Business Model. The ordinary formula for success for rail intermodal services is to move a large volume of cargo a long distance. The largest intermodal flows of international container are between West Coast ports and Midwestern hubs such as Chicago and Memphis, distances of 1,800-2,000 miles. The economics of such services also depend on high volumes at hub terminals, in some cases exceeding one million annual lifts.

NWCS Business Model. The 170-mile NWCS service between Portland, Tacoma, and Seattle is extremely short by rail intermodal standards. The service is made economically viable by the financial participation of Tacoma and Seattle ocean carriers using the service to compete for the Oregon market in lieu of direct Portland service.

The Tioga Group understands that the economics of the NWCS service depend on:

- Load/load container moves rather than empty/load round trips;
- Additional revenue from container storage and maintenance and repair work at Portland;
- Ownership or control of the rail cars;

- Additional empty container repositioning paid for by the ocean carriers; and
- Ocean carrier coverage of the Port of Tacoma lift fees.

Absent these sources of economic leverage and cost-sharing, it is unlikely that a stand-alone rail intermodal service between Portland and Puget Sound could compete with trucks.

NWCS explored a potential Willamette Valley operation in 2005–08. The firm located potential sites, and met with local representatives, the short line railroads, and local customers. NWCS also pursued a \$5 million federal grant to develop the terminals. At the time, however, UP was unwilling to support the project. Line capacity may have been a UP concern at the time, which was a period of rapid intermodal growth and congestion in some corridors.

Ocean Carrier Participation. Economic participation of the ocean carriers is a critical part of the NWCS business model. The carriers compensate NWCS for repositioning empty containers if needed so Oregon shippers pay only the equivalent of a one-way loaded move. The ocean carriers also absorb the Port of Tacoma lift fee, which would otherwise be \$70 per container. Similar ocean carrier participation or an equivalent subsidy from an outside source will likely be necessary for a Willamette Valley intermodal rail service to succeed. There may be less motivation for ocean carriers to participate if they already have the Willamette Valley traffic under current rates through NWCS or under rate agreements that require the customer to pay for drayage.

Competitive Response. Bringing intermodal costs under existing truck rates will not guarantee a lasting price advantage. As of late 2015, truck rates remain high due to the shortage of capacity and the longer turn times experienced with Tacoma and Seattle trips. Motor carriers have considerable latitude in pricing, however, and can be expected to respond to new intermodal competition by reducing rates to keep the business.

Potential Benefits

The primary beneficiaries of a Willamette Valley intermodal service would be importers and exporters that could use the service instead of trucking to and from NWCS at Portland or the ports of Tacoma and Seattle. The extent of benefits would depend on volume and on savings over truck costs. The volume depends in turn on the market area that could be accessed and the share that can be achieved. The cost savings to customers would depend on the development and implementation of a business model to bring the customer cost below that of trucking.

Potential Public Agency Role

Given the interest by Willamette Valley shippers in this concept, state agency financial assistance may be warranted to fund a detailed feasibility study and business case. The feasibility study should determine:

- The cost factors involved (e.g., local truck drayage, terminal operations, rail equipment supply, line-haul rail service), and how those costs would compare to comparable truck rates.
- The availability and development cost of potential terminals sites.

- The documented interest of UP, short-line railroads, ocean carriers, and intermodal terminal operators in providing rail intermodal service, and their expectations for compensation.
- Available volume commitments from anchor customers.
- Potential business volumes under different rate and service scenarios.

The detailed business case should then determine the requirements for success, the potential benefits to the state of Oregon, and, if justified, the options for implementation. This detailed business case should also evaluate the experience of similar facilities in other U.S. markets.

Any long-term public agency involvement should be contingent on private sector development of a robust business and operations plan with the necessary commitments from anchor customers, UP, and ocean carriers. Longer term, there may be a state role to help advance such service via start-up grants, demonstration project funding, or conventional economic development tools used to encourage new businesses of any kind. In the absence of sufficient subsidy from private stakeholders, public agencies might be asked to fund permanent operating subsidies.

There have been many cases of public support for intermodal terminal facilities or equipment. The NWCS terminal at Boardman used *ConnectOregon* funds, and NWCS is also using public funds to rebuild and upgrade double-stack cars.

Next Steps

Rail intermodal service over such short distances requires special circumstances to succeed. NWCS Portland appears to have assembled a working formula involving favorable terms from ocean carriers, rail car ownership, and load-load operations.

Concrete, detailed, private sector proposals for Willamette Valley intermodal yards and service have yet to emerge. The 2005–08 NWCS efforts to establish a Willamette operation suggest that under the right circumstances such an operation might succeed. Public agency participation may be appropriate if NWCS or another stakeholder can bring together the necessary elements, most critically support from UP and the ocean carriers.

5. Columbia River Barge/Rail Service

Overview

The former Columbia River container barge service has been dormant due to loss of the ocean carrier connection at Portland. Due to heavy-weight loads and low margins, agricultural producers are significantly affected by the lack of barge service with increased transit time, logistics costs, and business risks. The present service replaces part of the Columbia River barge service between Lewiston and Portland with a barge/rail combination:

- Barge service between Lewiston, Idaho and Boardman, Oregon;
- NWCS rail intermodal service between Boardman and the NWCS terminal in Portland, and

- NWCS rail intermodal service between Portland and Seattle/Tacoma.

The Boardman-Lewiston-Portland-Seattle/Tacoma barge/rail service repositions empties to Boardman by rail, re-establishes barge service from Lewiston to Boardman, and provides rail intermodal delivery to Portland and Seattle/Tacoma ports. Hapag-Lloyd sponsored the repositioning of empty containers to Boardman.

Benefits

The immediate benefit of barge/rail service is to reduce source-to-port movement costs for upriver shippers in the Lewiston and Boardman area. These customers have been facing trucking costs for movement to Tacoma that greatly exceed the previous barge costs to Portland. Heavy-weight pulses (e.g., peas, beans and lentils) and other agricultural products from Eastern Oregon, Idaho, Washington and Montana have specific movement needs. There is a significant shortage of trucks and heavy-weight chassis for transport of these products, particularly east of Portland. Moreover, the service is taking these truck movements off the highways.

The barge/rail service also benefits the Port of Morrow, where state investment in capacity that was underutilized, can now be put into service to a much greater extent.

An additional long-term benefit is the retention of Lewiston barge service that can be re-connected to the Portland T-6 when weekly vessel service resumes.

Requirements

The major facility and operational requirements of the barge/rail service are:

- Barge terminals at Lewiston and Boardman capable of handling containers;
- A regular, efficient barge service between Lewiston and Boardman;
- Rail intermodal terminals at Boardman and Portland; and
- Regular, efficient rail intermodal service between Boardman, Portland, and the Puget Sound ports.

These capabilities were all in place from the previous Tidewater Barge container service discontinued with the departure of Hanjin and Hapag-Lloyd T-6 service.

The organizational, financial, and institutional requirements include:

- Commitment by UP to move intermodal cars between Boardman and Portland; and
- Commitment by the ocean carriers (initially Hapag-Lloyd) to make empty containers available at Boardman and competitive rates available at Tacoma.

Existing Efforts and Status

In November 2015, NWCS and the Port of Portland obtained the commitments required to launch this barge/rail container service. This service is being implemented as a partnership with NWCS, Tidewater Barge, Hapag-Lloyd, Port of Portland, Port of Morrow and Port of Lewiston. The key

objectives are to sustain barge economics for upriver shippers, maintain barge capability, and anchor container cargo transfers in Portland.

- Empty containers are transported by rail to Boardman weekly (carriers will pay the repositioning cost), and then by Tidewater Barge to the Port of Lewiston every other week.
- Tidewater barges arrive at the Port of Lewiston with assigned/booked export containers by booking, approximately 90 empty containers currently. The barges are immediately reloaded with loaded export containers and moved to the Port of Morrow in Boardman. These containers are then trucked to NWCS's rail terminal in Boardman.
- At Boardman, Oregon local agricultural products can be added to the NWCS loads.
- From Boardman, containers move on UP rail lines with NWCS to their Portland terminal. A portion of these containers could be trucked to T-6 for Westwood shipment to Asia (monthly currently with expansion potential). Containers not delivered to T-6 continue via UP to Tacoma/Seattle.

The initial service is bi-weekly, with expected expansion to weekly as volume increases. The service would use the barge terminals at Boardman and Lewiston as local hubs, as was the practice prior to the T-6 service loss. The participants are seeking an increase to weekly service, which would provide an opportunity to maximize the state's investment in Boardman by creating an inland hub at Boardman. Additional benefits to Oregon agricultural shippers will accrue from the expansion of barge/rail service. Cargo movement from Idaho and other points helps build the cargo market critical to expanding and sustaining T-6 service.

Many of the commodities formerly shipped by barge are dense, and a fully loaded ocean-going container of pulses, for example, would exceed highway weight limits. To enable the barge/rail combination to handle heavy loads safely, NWCS has acquired rail cars capable of carrying 53,000 pound loads in 20 foot containers versus the 44,000 pound loads ordinarily feasible for trucking.

A second key factor in barge/rail feasibility is cooperation of the ocean carrier in container supply and free time. The Port has assisted in negotiations with Hapag-Lloyd to bring this about.

Potential Public Agency Role

The Port of Portland has provided limited start-up seed funding for the barge/rail service to help with drayage costs from the river to the rail loadings at NWCS Boardman. If the proposed barge/rail service is commercially successful and can accommodate demand, there may be no public agency role. A public agency role could emerge if there is some obstacle to start-up or expansion that public agency action could overcome. Possibilities include a need for more terminal space or low-cost capital for additional equipment.

Next Steps

The barge/rail service is currently in a start-up phase, with planned expansion to weekly service. Monitoring the development of this service should be part of the Trade and Logistics Initiative.

6. Portland Transloading, Cold Storage and Logistics Services

Overview

Many Oregon shippers rely on third-party logistics services such as transloading, independent cold storage, freight forwarding, or consolidation for their containerized imports and exports. Small and medium-sized shippers (SMEs) often lack these specialized capabilities, especially when imports and exports are not a large part of their business. Large shippers also use third-party logistics services for specialized needs or when their own capacity is exceeded in peak seasons.

Benefits

In the long run, the Port of Portland and its Oregon customers would benefit from having the full array of such services available. Moreover, these activities generate Oregon jobs and tax revenue. Finally, growing and maintaining these capabilities in the Portland metro area will assist in anchoring trade functions near the Port of Portland and increase the commercial potential for direct vessel calls at T-6.

Requirements

Third-party logistics providers (3PLs) can offer a wide variety of services to supplement the capabilities of Oregon importers and exporters. As described in a separate effort to facilitate the use of such services by SMEs, 3PLs fill a critical gap for companies that have specific import or export logistics needs but lack the volume or capital required to fill those needs themselves.

Transloading. Transloading refers to the transfer of cargo between marine containers and domestic containers, trailers, or rail cars. Transloading occurs in both directions. Imports can be transloaded to larger domestic equipment to save on inland transportation cost, or allow mixing and matching shipments. Exports can be transloaded from bulk domestic shipment to marine containers, or to condense multiple domestic shipments into fewer, larger international shipments.

Heavy and bulky export commodities such as hay, pulses, grain, forest products, and wine are important to Oregon's economy and to the Port of Portland. These commodities are often moved by truck in highway-legal quantities and transloaded into heavy container loads near the Port. Overweight imports can include wine in bulk, marble countertops, hardwood lumber and veneer. It would benefit Oregon importers and exporters, and the Port of Portland to establish and retain sufficient capacity for transloading and other logistics services in Portland.

Overweight Container Loads. When loaded containers exceed the standard highway weight limit, they require either a special permit or a designated overweight corridor for legal movement, and may also require a "super chassis" or other special equipment.

Portland's competitors have or are creating designated overweight corridors in the port areas to facilitate such movement and encourage the growth of import and export transloading. The ports of Tacoma and Oakland both have overweight corridors and the Port of Seattle has just announced its intention to develop such a system.

Transloaders and their contract truckers that routinely move overweight marine containers would likely require annual Contiguous Operation Variance Permits (COVPs) from ODOT. These are

available from the Oregon Trucking Associations, the Clackamas County Motor Carrier Division, and other agencies. These permits cover Portland streets, according to the ODOT website, which enables transloaders to move heavy loads to and from T-6 as long as there are no posted route restrictions.

Based on The Tioga Group's understanding to date, the COVPs would meet the needs of Portland import and export transloaders. This understanding should be verified with industry stakeholders.

Cold Storage. Refrigerated frozen or chilled cargoes are important to Oregon's economy and have been historically important to the Port of Portland. The Phase 1 research report documented the importance of fresh and frozen fruits and vegetables, seafood, and beverages in the 2014 T-6 cargo flows. Some workshop participants suggested that new Oregon cold storage facilities could serve to anchor cargo flows in Portland or attract new Portland cargo.

In April 2015, Ecotrust published a report analyzing infrastructure issues in Oregon food production.ⁱⁱ The Ecotrust study concluded that adequate cold storage capacity existed, or could quickly be added both in general and for some specific commodities they studied (e.g., beef, small grains and legumes, storage crops and greens).ⁱⁱⁱ The report notes a potential shortage of cold storage and freezing facilities for chicken,^{iv} and that additional freezing capacity may need to be considered for beef^v and pork^{vi} as well.

To the extent a shortage of cold storage exists, it is likely to affect small users most. As Sno Temp chief executive officer Jason Lafferty said, "In a bulk warehouse environment, bringing in a pallet or two or three is a challenge. We've had to say no to the smaller folks. We've been protecting space for our core customers."^{vii} Amanda Osborne, the lead author of the April 2015 Ecotrust study, stated that small processors "always run out of cold storage first."^{viii}

Oregon and Washington have numerous cold storage facilities in keeping with the importance of perishable commodities to both states. Most export cold storage facilities are in production regions rather than near the port. These locations allow producers to minimize the trip and time between harvesting, processing, and chilling or freezing. Once chilled or frozen, the product is less vulnerable, and can be transported in refrigerated equipment with minimal, if any, loss of quality. Many of the cold storage facilities near the ports specialize in seafood, and their location is chosen for access by commercial fisheries.

It appears that cold storage operators are investing in more capacity near production areas. A recent study sponsored by Business Oregon noted the need for a cold storage facility in the North Coast region.^{ix} Business Oregon also was instrumental in assisting NORPAC Foods, Inc. and Henningsen Cold Storage to expand facilities in Salem. In addition to the Salem expansion,

ⁱⁱ *Oregon Food Infrastructure Gap Analysis* (Ecotrust, 2015)

ⁱⁱⁱ *Ibid. passim*, particularly pages 60, 117 and 200

^{iv} *Ibid.*, p. 87

^v *Ibid.* p. 117

^{vi} *Ibid.* p. 146

^{vii} "Oregon Cold Storage Plant Announces Expansion," Capital Press, August 7, 2015

^{viii} *Ibid.*

^{ix} *Regional Economic Development Forums, Discussion Summary – North Coast Region* (Center for Public Service, Portland State University, August 5, 2014)

Henningsen expanded its Portland facilities by 2.7 million cubic feet in 2014. A new \$14.5 million cold storage and rail spur project recently opened in Boardman, aided by \$6 million in *ConnectOregon* funds. This facility will be heavily used by ConAgra Foods-Lamb Weston to store frozen potato products.

At competing ports such as Oakland, there are cold storage facilities for imports, where container loads of chilled or frozen products can be unloaded and stored until sold in smaller lots. The same facilities can often handle both imports and exports, and both frozen and chilled products. For example, VersaCold opened a new 196,000 square foot refrigerated storage facility near the Port of Tacoma to serve Grocery Outlet on October 5, 2015.^x

The Port of Oakland issued a Request For Proposal for a “Cool Port Oakland” cold storage development in February 2014. The resulting project involves a \$47 million, 375,000 square foot, rail-served facility to be operated by Lineage Logistics.

A Rivergate area rail-served cold storage and transload facility could assist in recruiting niche refrigerated vessel or container services to call T-6 with import cargo for processing and distribution. Oregon exporters would then be able to access a larger supply of empty refrigerated equipment for chilled and frozen products. By offering a near-dock, rail-served cold storage option, Portland would compete with Washington and California ports in this growing cargo segment. No Washington or California cold-storage transload facility has the proximity to T-6 that a Rivergate facility would have.

There is an inherent “chicken and egg” aspect to additional cold storage facilities. Such facilities would help to attract new vessel services, but new vessel services may be necessary to induce cold storage development.

Existing Efforts and Status

There are existing providers of transloading and other logistics services in Portland, but it is not clear at this point that they can offer the depth and breadth of services required. Facilities in Portland and Vancouver currently include:

- Chipman Relocations
- Expeditors International
- Bridgeport Distribution
- BTS Container Service
- C.H. Robinson Worldwide
- Columbia Transfer
- Independent Dispatch

These facilities typically consist of warehouses and cross-docking areas. All such firms offer multiple logistics services, including:

- Crating and packing
- Foreign Trade Zones
- Labelling and kitting
- Customs brokerage
- Oversize, overweight, and project cargos
- Household goods moving and storage
- Cold storage

^x “VersaCold opens Port of Tacoma distribution center,” *Refrigerated Transport*, October 5, 2015.

- Freight consolidation.

In the long run, the Port of Portland and its Oregon customers would benefit from having the full array of such services available.

Port of Portland staff in the Commercial Department has been actively engaged in marketing transloading and logistics operations for the past five years, as transloading and logistics facilities are attractive candidates for Port property. Three companies have transloading operations in the region – Fred Meyer International/Kroger, Xerox, and Dollar Tree. Regular container service is considered a prerequisite for growing Portland transload facilities for large importers. Transloading is also one way to free up empty containers for Oregon exporters.

The Port already maintains information on available industrial sites on its website, including those in the Rivergate area. (The “bow tie” site in Rivergate was referenced in the Satellite Container Yards business case.)

Potential Public Role

Facilitating expansion of transloading and logistics services in Portland might be accomplished using conventional economic development tools on non-Port of Portland property or as a project on available Port property.

The potential public sector role in cold storage capacity expansion would be similar to that described for Portland-area transloading and logistics: conventional economic development efforts targeted at a specific industry, or a Port-led property development effort. The efforts by Business Oregon to support the NORPAC and Henningsen expansions in Salem and the *ConnectOregon* support for the Boardman facility are clear precedents for public agency involvement in cold storage capacity expansion.

Next Steps

Expanding and anchoring transloading, cold storage, and other logistics services in Portland could be a valuable part of the Trade and Logistics Initiative. There is a clear public role, and precedents for similar public-private engagement at ports and airports elsewhere. The Tioga Group has not established that there is near-term need for capacity expansion. Detailed evaluation of the need and opportunity for additional transloading capability would require a more detailed assessment of current service capability, a comparison with potential Oregon shipper needs, and a determination of how to bridge any gap.

The industry itself is fairly aggressive about expansion into new services and markets. The recommended strategy is to have the public tools and capabilities in place when the need arises from the private sector. This would entail a working relationship between Business Oregon, Port of Portland Commercial Department staff, and local Portland-area development staff as needed to maintain an inventory of potential sites, incentives, and other means of encouraging and supporting private transload, cold storage and logistics facilities.