

Invest Now or Pay Later?

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AN INTERNATIONAL TRADE GATEWAY

The economic health and growth potential of the Portland metropolitan area is dependent upon the efficient operation and utilization of the multi-modal transportation system serving the region. The relationship between transportation access/efficiency and economic prosperity to the region is well known as an essential avenue for trade in regional and global markets.

The early settlers and business entrepreneurs of the region understood this concept well shortly after Meriwether Lewis and William Clark explored the river region in the early 1800s. The Hudson Bay Company, one of the earliest exporters



of the region, developed its regional headquarters at Fort Vancouver in 1825 to export furs and hides collected in the area to markets in Europe and beyond (Lang). The company chose to locate at Fort Vancouver, some 100 river miles from the Pacific Ocean, because the Columbia River provided quick and efficient access to international markets, serving a collection/assembly function for downriver exports and a distribution function for upriver import movements. The region grew and prospered as a result of abundant natural resources and the efficient access to the Pacific Ocean and world markets, as the Oregon Steam Navigation Company (1860-1883) provided steamboat transport for regional products throughout the lower and middle river region (Lang).

The importance of the river to the economic development of the region is unparalleled. Even after Union Pacific brought rail service to Portland and connected the region to the eastern United States in the early 1900s, the river continued to be the primary trade corridor. In fact, early city founders designed the city such that streets ran perpendicular and parallel to the river, regardless of north/south bearings, underlying the importance of access to river transport (City of Portland).

Today the Portland metro population exceeds 1.95 million people and is projected to reach 2.2 million by the year 2010 (Portland Development Commission, 2002). It is one of the top ocean freight ports on the west coast for both container and bulk cargo shipments and serves as an important freight distribution center for import/export trade. For bulk cargo, grain and forest products are principle exports, largely assembled from upriver supply points along the Snake/Columbia River system or shipped via rail from upper mid-western grain producing states and destined for markets in Asia and the Middle East. Containerized export shipments moving through this trade corridor include a variety of other agricultural and natural resource products (see Table 1) but are heavily concentrated in Hay/Animal Feed (43,709 containers), Frozen French Fries (6,304 containers) and Vegetables (2,298 containers) (Burnham, 2004).

To a large extent, the local and regional economy reflects this concentration, with total regional employment predominately concentrated in Trade (25%), Manufacturing (14%), and Transportation, Communication and Utilities (6%). Collectively,

Table 1. Agricultural Exports, Port of Portland, 2003

Product	TEUs
Hay/Animal Feed	43,709
Frozen Potatoes (French Fries)	6,304
Vegetables	2,298
Hides and Skins	2,011
Chilled or Frozen Meat	1,791
Grass Seed	1,730
Dried Peas, Beans, Lentils	1,347
Onions and Shallots	1,138
Hazelnuts	995
Sweet Corn	978
Potato Flakes	528
Other Potatoes	521

Source: Western Farmer-Stockman, September 2004

these account for 45% of the total regional employment (Oregon Labor Marketing Information System, 2002).

The employment and economic base of the region has historically benefited from the transportation infrastructure serving the region, especially the Columbia/Willamette River serving as the international trade corridor for many products that are produced, manufactured, and/or assembled throughout the Pacific Northwest. Complementing this river transportation system has been two Class I rail companies providing both north-south (Burlington Northern Sante Fe) and east-west (Union Pacific) service, in addition to several short line rail companies providing targeted, regional rail service. Combined with a growing air freight capacity and an extensive road and highway network consisting of interstates I-5 and I-84) and state and local highways supporting truck freight movements, the Portland/Metro region comprises a complete multi-modal transportation network.

Benefits of the Transportation/Distribution System

This multi-modal transportation system has brought about many economic benefits by increasing competition among transportation modes. While many interactions between truck-bergo, truck-ocean vessel, and truck-rail are complementary in nature, for those regions and markets where they compete, shippers and area businesses benefit from competitive forces. Benefits of having competition in a marketplace are many, including lower shipping rates that begin to reflect the cost of operation, multiple shipping options, and enhanced service to shipping customers and incentives for innovation and technological change (for example, larger ocean vessels, more energy efficient power units for trucks/trains, increased cargo capacity for truck/rail). As a result of these service and efficiency gains, new and more distant markets may be reached, thereby increasing the demand for transportation services. In the absence of multi-modal competition, transportation service declines, shipping rates increase, and efficiency is diminished.

The local and regional economy has also benefited from the emergence and proliferation of warehousing/distribution centers providing transportation, logistics, and inventory services, largely resulting from the importance of Portland as a major international import/export gateway. The significance of this sector on the regional economy is substantial, as detailed in a recent report prepared by Martin Associates for the Port of Portland entitled, "The Economic Impacts of the Value Added Regional Distribution Industry In the Portland Area." This report quantifies the economic value that this particular industry contributes to the local economy in term of jobs, personal income, business revenue, local purchases, and state/local taxes collected. Martin Associates surveyed a total of 67 warehouse/distribution center operations in the Portland/Metropolitan area, incorporating a variety of commodity and product types (for example, apparel distribution centers, national grocery chains, local food/seafood distributors, paper products, beverage products, steel distributors, lumber/forest products, general commodities, and miscellaneous dry bulk distribution centers). Collectively, this industry generates 17,242 jobs in the region, 46 percent of which are directly related to distribution center employment activity and the remaining 54 percent being induced or created indirectly from businesses supporting this industry or purchases from directly employed labor. Total wages from these 17,242 jobs is estimated at \$810 million in personal earnings. The total revenue generated from this industry in the region is

estimated at \$2.8 billion, with over \$88 million in state and local tax receipts. These findings represent a sizeable component of the local and regional economy and further illuminate the importance of this international trade gateway to area businesses, both directly and indirectly (Martin Associates, 2003).

Improvement in freight mobility often leads to accelerated economic development/expansion opportunities during positive growth periods and strengthens economic productivity and performance during stagnate or recessionary periods. Targeting transportation infrastructure investments and policy improvements that help reduce freight travel time, congestion, frequency of accidents and that help improve reliability, accessibility, logistical efficiency, and total capacity lowers total freight transportation costs and improves service. By lowering costs while improving service, new markets evolve, stimulating economic activity. But improvements to total freight mobility cannot occur unitarily, one transportation mode at a time. In order to maximize the synergistic competitive/complementary relationships among modes, all modes must be strategically considered, especially inter-modal movements. This synergy will also increase regional economic productivity and competitiveness, especially related to port activities as they increasingly compete in the global marketplace. An efficient multi-modal transportation system that out-performs other international gateway cities will provide a regional competitive advantage. Achieving this goal requires a strategic plan and a concerted effort based upon access to accurate, timely, relevant data and investment prioritization that maximizes efficient utilization of limited resources. Once a plan is developed, the public must buy-in, a process that involves an educational and information exchange function where public-private benefits are enumerated, understood, and presented to voters, legislative bodies, lobbyist, and state policymakers in a clear, convincing manner. This process applies any time in history but is especially important given the current spate of challenging transportation issues confronting the region and state.

EMERGING FREIGHT MOBILITY ISSUES

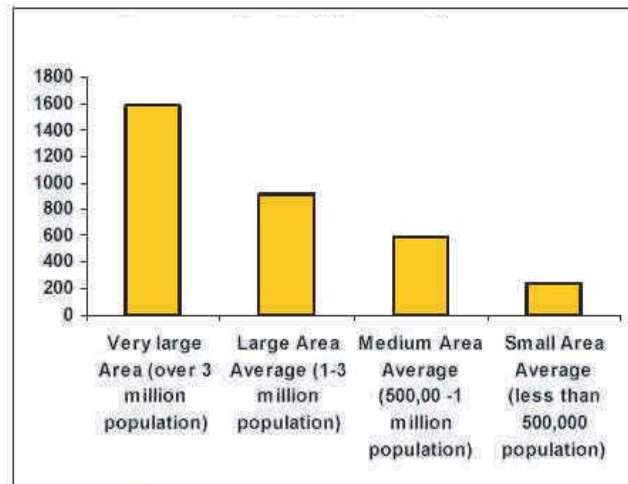
Traffic Congestion

Among the certainties of death and higher taxes, one may need to add congestion! There is little doubt that the Portland/Metro region will continue to experience positive population growth, as it has over most of the city's existence (the city

population did decline slightly between 1970 and 1980) (Portland Development Commission, 2002). The estimated rate of growth varies from year to year but is generally expected to increase between 1.5 and 2.5 percent per year on average over the next twenty years. The average annual population growth between 1986 and 1999 for the region was 2.2 percent (Portland Development Commission, 2002). As population grows, so do the demands placed upon the already strained transportation infrastructure as it seeks to accommodate the increased volume of traffic from passenger and freight transportation. In addition to projected increases in passenger travel competing for highway capacity in the region, projected economic growth in the region is expected to drive the demand for freight transportation double over the next twenty years. It is interesting to note that population growth and overall economic activity generally are directly linked to the demand for freight traffic. In reality, this relationship doesn't always apply. Between 1990 and 2000, the national population grew by only 9 percent while employment in manufacturing declined and total employment (driven mostly by the service sector) increased. During this period, freight ton miles increased by 19% and the value of manufacturing shipments increased by 38 percent, suggesting much stronger demand for freight transportation than would have been expected from evaluating population growth and overall economic activity (Martland, Reebie Associates, 2004).

The additional costs associated with increased traffic congestion are numerous for freight transportation. Travel times increase, as do labor cost and operating cost in the form of lower fuel efficiency, greater fuel consumption, and greater wear and tear on equipment. Increased congestion also leads to greater frequency of accidents, leading to higher insurance premiums for motor carriers and transportation shipping firms. A recent study by the Texas Transportation Institute estimated the average cost of congestion per driver to be between \$200 dollars per driver for small cities (below 500,000) and \$1,590 per driver for cities with a population over 3 million (Figure 1) (Martland, Reebie Associates, 2004). Given current population growth rates, the Portland/Metro region will exceed 3 million people by 2025.

Added traffic congestion also pose implications from the state, including increased pavement rehabilitation at earlier intervals, bridge and overpass replacement and improvements, and greater frequency of automobile accidents. And most pavement decay functions do not decline linearly with additional weight and use, but rather decline at an increasing rate as usage increases, leading to rehabilitation cost functions that increase at an increasing rate.

Figure 1. Average Cost of Congestion per Driver

Source: Texas Transportation Institute

It is not feasible to assume that truck freight and the regional road and highway networks will be able to accommodate the projected increase in demand for freight transportation without substantial infrastructure investment. More than 50 million tons of annual truck cargo currently moves out of Oregon on I-5 and I-84 to destinations throughout the country (Figure 2) (United States Department of Transportation). A large component of this freight truck traffic arrives at the Port of Portland from international markets, is moved to warehouse/distribution centers throughout the region, and is then shipped to every corner of the United States, further illustrating the city's importance as an international trade gateway.

Motor Carrier Changes

Complicating this matter on a national level are the recent changes to the federal guidelines controlling truck drivers' hours of service. Under the new rules, truck drivers and operators may drive 11 hours after 10 hours of being off-duty but cannot exceed 14 hours of driving after the same 10 hour break. The net effect is roughly a reduction of one hour of productive time per driver. The change also stipulates that the drivers must be off-duty for 10 consecutive hours, not counting breaks for meals, waiting for loads, or fuel stops (Schulz, 2003). The change is expected to reduce the number of fatigue related accidents by a hefty margin

which may help reduce insurance premiums for trucking firms. Overall, the change is expected to increase their cost of operation. To compensate for lower hours of operation and productivity per driver, trucking firms will need additional drivers and equipment.

Truck Driver Shortages

The shortage of truck drivers is growing, exacerbating the problems of increasing traffic congestion and federal guidelines limiting hours of service for motor carriers. In recent years, truck driver shortages have been less pronounced, occurring primarily during seasonal peak demand periods for freight movement during the holidays or concentrated in specific regional markets. However, driver shortages are increasingly becoming a dominant national issue that is difficult during non-seasonal peaks and fierce during seasonal peaks (Hogan, 2004). This situation has led to a difficult combination of sustained demand for freight shipments due to a recovering domestic economy and declining value of the dollar making U.S. products more affordable to international markets, with a declining supply of truck drivers who are willing to deal with the difficult working conditions and relative low pay.

Oddly enough, in a period of growing demand for freight transportation services, trucking and transportation logistics firms have taken a major financial hit, resulting in a flurry of trucking firms going out of business in the past year. This phenomenon is occurring both nationally and regionally, chiefly due to the increasing cost of doing business for trucking companies. These costs include extremely high insurance premiums, labor shortages and increasing labor cost to attract and retain drivers, extremely high fuel prices, increasing fuel taxes, increased highway user fees (tolls), and high cost of replacing equipment. Added to these are increasing highway congestion and reduced hours of service for truck drivers.

State Rail System Approaching Capacity Constraint

The projected doubling of total freight traffic over the next twenty years likewise has serious implications for the regional freight rail system, given the assumption that the region's highway system cannot adequately absorb this growth alone. This regional rail system, consistent with national trends, has experienced significant

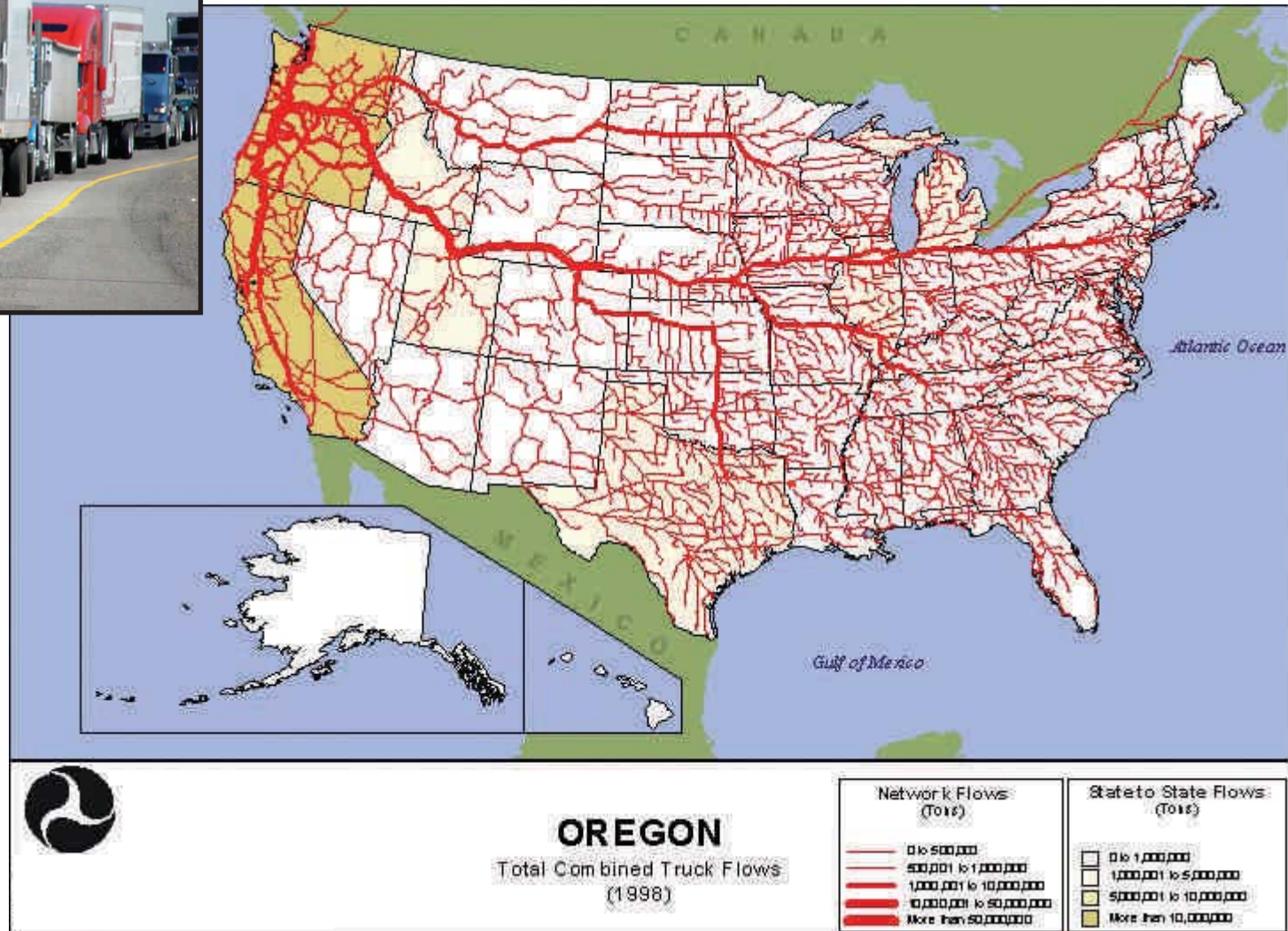
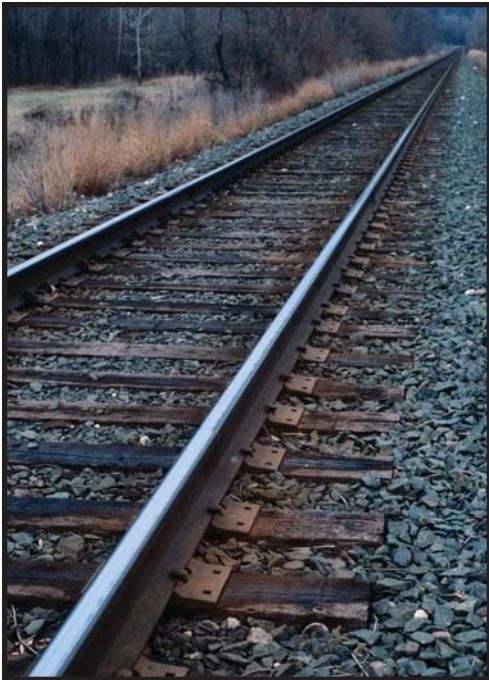


Figure 2: Total Truck Flows From Oregon, Domestic and International, 1998

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Operations Core Business Unit

changes over the last twenty years following deregulation of the rail industry in 1980. While many of these changes have streamlined rail operations for Class I carriers, leading to improved service, lower rates, and improved productivity, overall rail capacity has diminished. In order to achieve these efficiency gains on targeted, high-volume rail corridors, many miles of low volume rail lines have been abandoned or sold off to short-line operators who have greater operational flexibility. Additionally, given the capital intensive nature of this industry, many low volume rail lines fail to generate enough revenue to adequately recoup the fixed cost of rail infrastructure replacement, leading to a “cost-minimization” approach to operations management and declining rail line conditions over time (Cambridge Systematics, 2004). However, a recent study by Cambridge Systematics, Inc. for the Port of Portland entitled “Freight Rail and the Oregon Economy” revealed that while the state’s rail system is productive, stable, and competitive, needed infrastructure improvements may limit future volume growth and rail capacity. This study provides an in-depth evaluation of the state’s freight rail system, including freight rail use by industry and rail capacity/constraint issues by specific rail corridor.

Of the five freight rail corridors that currently experience or that likely will experience capacity constraints in the near future, the Portland Triangle, consisting of the interchange between the north-south and east-west corridors in the center of Portland, represents the most pressing congestion and capacity problem. Those industries that rely most heavily on freight rail service in Oregon are lumber, the wood and paper products industry, the transportation equipment industry, the wholesale trade industry, and the Port of Portland’s marine terminal business (Cambridge Systematics, 2004). The reliance of these key components of the economy on an overburdened transportation infrastructure does not bode well for the region’s competitiveness as freight traffic doubles.



Columbia River Channel Depth/ Deferred Snake River Dredging Constrain Vessel Size

The river system, including both barge and ocean vessels, also moves a significant volume of freight traffic. When compared to truck as a proportion of total freight tonnage shipped in the Portland/Vancouver area, barge and ocean shipments are considerably less, accounting for 5.4 and 9.7 percent respectively (Table 2). Rail accounts for 12.7 percent of inbound shipments but for a very low percentage of outbound shipments, illustrating that most inbound rail volume is being exported abroad. It is interesting to observe that ocean freight in the Portland/Vancouver region is heavily weight toward outbound movements (18.2 percent) relative to inbound shipments (7 percent). This pattern is due to the smaller import market relative to outbound export movements through the Port of Portland. These estimates were part of the recent Commodity Flow Forecast and Lower Columbian River Cargo Forecast, which also projects a doubling of freight traffic over the next twenty years. This study additionally forecasts how that additional freight volume would be shipped and the proportion allocated to each mode (Table 2). The values in red represent the percentage of additional or new freight volume growth shipped by each mode. Clearly, truck volume is expected to accommodate the majority of increased freight traffic, accounting for 81 percent of additional freight tonnage in the Portland area (DRI-WEFA, 2002).

Many factors may affect down river barge movements and ocean exports, including river dredging to maintain adequate channel depth for barge loading at upriver Snake/Columbia port terminals and possible river draw-downs aimed at improving native salmon survival rates. Given the large volume of grain (wheat and barley), hay (Timothy and Alfalfa) and forest products that utilize barge service for outbound transport along the Snake/Columbia River, major modal shifts would occur in the event that the river or parts of the river became non-navigable. If the river became non-navigable, the movement patterns of tonnage of freight through the Port of Portland also would change.

Loss of Container Service at the Port of Portland

Perhaps the most significant issue impacting regional trade and those businesses that rely upon trade (warehousing/distribution centers, transportation/logistics

Table 2: Percentage of Total Tons Shipped By Mode in the Portland/Vancouver Area, 1997

Mode	Percent of Movements				
	Internal	Outbound	Inbound	Total	Forecasted 2030%
Truck	61.2	57.3	48	63.9	81
Rail	0.2	1.7	12.7	5.6	8
Intermodal	0	5.6	6.1	4.5	5
Barge	1.6	4.7	7.8	5.4	1
Ocean	0	18.2	7	9.7	4
Air	0	0.2	0.2	0.1	0
Pipeline	0.1	0	28.1	10.8	1
Total	63.1	87.7	110	100	100

Source: Commodity Flow Forecast Update and Lower Columbia River Cargo Forecast, June 2002

firms) is the recent loss of two shipping lines providing service at the Port of Portland. “K” Line and Hyundai Merchant Marine no longer call at the Port of Portland, representing a significant loss in containerized cargo service for area agriculture shippers that relied upon accessing markets in Japan. In addition to lost revenue for the Port of Portland, area agriculture producers are seeking alternative shipping routes in order to get their products to market. For most, finding new routes means increased transportation costs as cargo previously passing through the Port of Portland now is shipped via truck or rail to the Ports of Tacoma or Seattle. This loss of ocean container service represents about one third of the total cargo tonnage leaving the Port of Portland. The Port of Portland is confident that replacement service will be found, but the difficulty of attracting other shipping lines increases with the passing of time as shippers develop alternative shipping options and secure contracts. The Port of Portland has recently reported that the one remaining shipping line, “Hanjin Shipping,” will increase service at the port, helping alleviate some export capacity concerns (Hedaa, 2004).

Challenges that have hindered the Port of Portland’s competitiveness in the past include the time and cost of negotiating the 100 river miles to reach the port and the 40 ft. Lower Columbia River channel limitation that prevents larger vessels from accessing the port. Plans have been underway for some time to deepen the channel to 43 ft., which should increase ship capacity by roughly 800 TEU per ship and contribute to lower cost per unit for shippers. But several hurdles remain on the river deepening project, including available funding allocated from the Corps of Engineers 2005 budget. In light of the severe congestion and bottlenecks occurring at other west coast ports, primarily those in Southern California, the Port of Portland may appear a smart alternative. However, the Ports at Long Beach and Los Angeles are so congested because of the size of the import market there: 23 million people live in the L.A. region as compared to barely 2 million in the Portland area.

OPPORTUNITIES FOR IMPROVED FREIGHT MOBILITY

If future economic growth and prosperity are expected to follow from historical precedent, and if success depends largely on how effective the area serves as an international trade gateway for export/import markets, assembling an efficient multi-modal transportation system will provide a reality check for the region. As previously mentioned, several forces collectively point to difficult decisions ahead related to essential transportation investment improvements. The region’s highway and road network is currently experiencing traffic congestion at certain periods throughout the day that impedes freight mobility and system efficiency and that contributes to bottlenecks/chokepoints on key truck freight corridors. Thus, the current highway system network is operating at or near capacity, certainly for specific time intervals, and along specific highway segments. The ability of truck transportation to accommodate future freight growth will therefore require physical capacity expansion through additional infrastructure or improvements in system performance, possibility from the FHWA’s concept of operations approach. Likewise, the regional rail industry, while currently providing stable and reliable freight service, is increasingly burdened and vulnerable to capacity constraints given the historically low public investment in rail infrastructure and the difficulty of many rail lines to generate adequate revenue for infrastructure maintenance and replacement. Finally, waterborne freight movements (both ocean and river vessels) are facing physical capacity constraints due to the river channel depth restrictions

that limit vessel size or load capacity. Addressing any one of these investment needs will be difficult, especially given projected growth in freight traffic and limited resources and state budgets.

Several different agencies and private organizations throughout the region have been heavily involved in data and information collection and analysis, especially as it relates to freight movements. This positive move to improve freight mobility aims at increasing the overall understanding and awareness of the regional freight transportation system while addressing current operational or capacity limitations and targeting strategic transportation investments to address overall system needs. Multi-modal transportation investment projects may also be more effectively prioritized and completed.

The Oregon Department of Transportation funded a recent, successful multi-agency data collection effort that was supported by both the Port of Portland and METRO Regional Planning. This Truck Trip Data Collection Methods Study conducted by Eric Jessup, Ken Casavant, and Catherine Lawson addresses the growing need for necessary data on urban or inter-city freight movements and focuses on testing different data collection/capture methodologies and the extent to which those freight data attributes necessary for both modeling and statewide planning efforts are achieved. Understanding transportation details such as origin-destination, route identification, land-use at stops, commodity, weight, vehicle configuration, time of day, volume of shipments, and location of trip generators is necessary for statewide and metropolitan freight modeling and planning needs. This pilot study was designed and implemented in the Portland-Vancouver metropolitan area, testing roadside intercept surveys at three different locations including one weigh station along I-84, a private freight warehouse/distribution center, and at the Port of Portland's marine terminal six. The results and findings of this study have helped shape the larger regional freight data collection study that the Port and ODOT are currently supporting.

The Columbia River Channel Deepening project also represents a collective effort by different agencies, states, and private organizations. This transportation investment project is one of the larger in the region, estimated at \$150.5 million. Both Washington and Oregon have allocated \$27.7 million in matching funds, with a large portion of the project cost dependent on federal appropriations including the U.S. Army Corps of Engineers' 2005 budget allocation. Several agencies and organizations are supporting the project due to the importance of this freight corridor to international trade and regional economic performance. The Ports of

Portland, St. Helens, Vancouver, and Woodland, along with many business stakeholders, have formed a coalition to support the river channel deepening project. The Ports of Portland and Vancouver have further formalized their commitment to working together to address these types of emerging freight transportation issues by forming an Inter-Governmental Agreement (IGA).

The State of Oregon through its legislature has also recently supported addressing freight mobility concerns by designating \$100 million in new funding for freight related transportation improvement projects. This funding is primarily targeted to improve access to existing industrial areas and to improve job growth by attracting new businesses. These freight mobility improvement projects, as recommended by the Oregon Freight Advisory Committee, are evaluated based upon how well they improve safe and efficient movement of goods, foster public and private partnerships and investments, and support multi-modal transportation movements. These efforts, along with the creation of the Governor's Industrial Lands Task Force, help focus attention and resources on improving regional freight mobility.

Finally, we cannot understate the importance of education and information exchange to area business owners, local residents, and policymakers regarding the important connections among local business and regional economic performance, trade, state revenues, and transportation infrastructure investments. Made today, these investments will reap rewards and positive multiplier effects throughout the economy for years to come and will also foster, facilitate, and accommodate future freight transportation and economic growth throughout the region. Sustaining these investments in difficult economic times requires understanding their private/public benefits and suggests the need for future partnerships among private entities and public agencies.

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- Identifying the most pressing issues facing this metropolitan area and its communities, and developing the data and other information needed to fully communicate their scope and significance;
- Building capacity in the region to address critical metropolitan issues by:
 - brokering partnerships among faculty, students, and area communities to foster new understanding of and/or new strategies for addressing those issues; and
 - acting as a catalyst to bring elected officials, civic and business leaders together in a neutral and independent forum to discuss critical metropolitan issues and options for addressing them; and
- Developing new resources to support research and service activities needed to meet those objectives.

By acting effectively on this mission statement, the Institute will enable the:

- University to help advance the economic, environmental, and social goals held by the communities of the region; and
- Communities of this region to act collectively to seek and secure a sustainable future for this metropolitan area.

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