

# COAL EXPORTS FROM THE PACIFIC NORTHWEST AND THE ECONOMIC GROWTH OF THE NORTHWEST ECONOMY

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# FOREWORD

Washington State is a trade leader. More than 40 percent of all Washington jobs are linked to trade. And the value of Washington exports, per resident, is more than twice the national average. Global demand for the things we produce helped to build our state. It is a part of our heritage. And it drives our economy still today.

Recent proposals to build new bulk commodity terminals at existing area ports have ignited a debate over trade policy in the Northwest. Opponents of the proposed terminals take issue with coal being transported through the facilities. That has led some to call for a change in how Washington evaluates export or infrastructure projects, and even for controls on what products we export.

As the second largest export industry in Washington, the agricultural community has a significant stake in the outcome of this debate. The terminals themselves will directly serve some of our members, with the largest facilities handling wheat, grain, and timber products in addition to coal. All of our members will be impacted by shifts in the cost, efficiency, and reliability of transportation. And the entire state will be impacted by any changes to environmental policy that affect how we evaluate and manage infrastructure and trade projects.

With regard to environmental policy, the interests of our members are clear-cut. We believe strongly that the state's existing process for evaluating infrastructure projects should remain unchanged.

The economic interest of the agriculture community, in relation to the terminals, may be unclear.

To address this uncertainty, we commissioned Dr. Steven Globerman of Western Washington University to examine the impacts of the proposed terminals. Our question: would the growth of bulk exports in Washington be a cost or a benefit to the agriculture community?

The attached report offers three key findings important to our membership:

1. Coal shipments are likely to lower costs to other shippers, by improving the economics of infrastructure investment and operation in Washington.
2. More efficient import and export capabilities generate economic benefits for terminal customers, including agriculture. Those "upstream" benefits have not previously been quantified.
3. Existing economic studies likely underestimate the economic benefits from the terminals, and understate how broadly those economic benefits may be dispersed.

To paraphrase Dr. Globerman, expanding trade with the Asia-Pacific region will make Washington State economically wealthier, by enhancing our long-standing competitive advantage as a gateway for trade. As we debate the terminals, it's important that we not overlook the competitive advantage expansion of exports brings to domestic industries, like agriculture, and the value that advantage creates across our economy.

# EXECUTIVE SUMMARY

This study discusses how the proposed investments in bulk commodity terminals at Cherry Point and Longview can result in increased real income levels for residents of Washington State and, by extension, in other parts of the United States. The particular focus of the report is on the incentives to expand created for upstream industries that are likely users of the largest facilities, the Gateway Pacific and Millennium terminals. Industrial expansion should result in higher incomes for factors of production in the expanding industries, as well as lower prices for consumers of the products of those industries. Existing studies of the Gateway Pacific and the Millennium Terminal Projects focus on the on the employment and income created by the construction and operation of the terminals, as well as the induced spending created by this additional employment and spending. The economic consequences of lower transportation costs on exporters and importers have been generally ignored or understated in the debate surrounding the terminals. While this study does not offer quantitative estimates of the economic effects of lower transportation costs on the Washington State economy, it argues that these effects are likely to be substantial and fairly widespread throughout the state's economy. As a result, economic impact studies of the two facilities likely underestimate their total economic benefits to Washington.

Focusing on the upstream economic effects of the Gateway Pacific and Longview terminals at the state level obviously understates the national economic

benefits of new and more efficient seaport alternatives. A complete analysis of the impacts of the terminals on industries using those terminals, as well as on suppliers to and customers of those industries should encompass the country as a whole. However, Washington State residents are presumably concerned first and foremost with the economic welfare of their own state. In this regard, there may be a temptation to infer that beyond those who construct and work at the terminals, the only other possible economic beneficiaries of the new terminals are affiliated with the coal industry. Since coal production takes place outside of Washington, the inference might lead to a conclusion that Washington will enjoy no upstream-related economic benefits. This study argues against this conclusion.

The prospect of freer trade between the United States and the fast growing Asia-Pacific region provides Washington State with a unique opportunity to become economically wealthier by intensifying its long-standing competitive advantage as a gateway for trade between the United States and its Asian trading partners. Beyond the additional jobs and income associated with facilitating increased shipments of imports and exports, economic wealth in the state will be created by the expansion of domestic industries, particularly agriculture.

# INTRODUCTION

There has been an ongoing public controversy surrounding the construction of port facilities in the states of Washington and Oregon to be used for exporting coal. Indeed, an announcement on May 8, 2013 by Kinder Morgan that it was dropping its proposal to export coal to Asia from an Oregon-based port near Clatskanie means that only three of an original six proposals for coal export terminals remain under consideration. The pending projects are Gateway Pacific near Bellingham, Washington (up to 52.9 million tons per year); Millenium Bulk Terminals in Longview, Washington (up to 48.5 million tons per year) and Aubre Energy's Morrow Pacific project in Boardman, Oregon (up to 8.8 million tons per year).

Most of the controversy has centered on the potential environmental impacts of transporting coal by rail to Pacific Northwest ports, as well as the increased burning of coal by utilities and other coal consumers in Asian countries, particularly China, who are presumed to be the major customers of the coal that will be exported. There has also been some discussion of the direct and indirect employment effects associated with building and operating port facilities; however, relatively little attention has been paid to the impacts of coal exports on the longer-run economic growth of the economies of Washington and Oregon. A full assessment of the net social benefits of coal exports through Pacific Northwest ports should consider the potential contribution that coal exports might make to the long-run growth of income and employment in the Northwest, particularly through the expansion of other industries that may benefit from new port facilities.

Given that the bulk of the proposed coal port capacity is in the State of Washington, this report focuses on the potential for increased coal exports to promote the growth of international trade more generally through Washington ports, as well as the role that increased international trade might play in the future economic growth of Washington State<sup>1</sup>. This focus does not gainsay the relevance of the potential environmental impacts of increased coal exports, as the latter are clearly important considerations in any overall social benefit-cost assessment of coal exports; however, much has already been written about the potential environmental impacts and those without specialized expertise in the relevant environmental sciences have little to add to the debate. Conversely, the linkages between coal exports, the growth of overall international trade and the performance of the Washington State economy have not been as thoroughly discussed, and they are proper subjects of analysis for economists.

The specific issue considered in this report is whether and how increased coal exports through the proposed Gateway Pacific and Millenium facilities will promote higher real incomes in Washington State. To the extent that capacity installed to process coal exports lowers the cost of exporting other goods and services, the estimated direct economic contributions associated with increased coal exports are likely to understate the total economic contributions. Several existing reports provide estimates of the local economic impacts of the construction and operation of the Gateway Pacific and Millenium terminals. The main argument in this report is that existing studies likely underestimate the contributions of those terminals

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<sup>1</sup> This is not to imply that the Morrow Pacific project is of no economic importance.

to the real economic growth of Washington State. It must be noted that it is beyond the scope of this report to provide quantitative estimates of the linkages between exports of coal and exports of other goods and services through ports in Washington. Nor does it provide quantitative estimates of how much expansion in upstream industries in the state, e.g., agriculture, will result from the proposed investments at the Gateway Pacific and Millenium terminals. Rather, this report identifies and assesses conceptual arguments for the existence of economic benefits to the state beyond those already estimated in previous studies.

The report proceeds as follows. Section 2 provides an overview of the volume and composition of international trade processed through Washington ports. The discussion contained in this section underscores the well-known fact that international trade plays a vital role in the economy of Washington. It also identifies the types of goods that move through Washington State ports which have a bearing upon the issue of whether expanding infrastructure for coal exports will lower the costs of handling other types of goods at those ports.

Section 3 considers the potential for synergies between exporting coal and transporting other types of goods through newly constructed or expanded ports and related facilities. The existence of such synergies would suggest that the estimated direct employment and income effects of coal exports could understate their total impact on employment and income levels for the Washington State economy. Synergies are potentially related to the ability of shippers of different types of goods to improve efficiency by sharing infrastructure capacity. Improved efficiency translates into lower costs for shippers. The lower transport costs increase the profit margins of companies using the shipping

services. Higher profits stimulate an expansion of the business activities benefiting from lower shipping costs, and the expansion results in higher incomes for factors of production as well as lower prices for consumers of products. The net result is that the economic benefits from international trade that are linked to new transportation infrastructure facilities in Washington are likely to be larger and more widespread than would be suggested by a focus on coal exports.

Section 4 focuses in detail on the conceptual economic benefits of international trade to the economy of Washington State. While there is clearly increased employment and income associated directly with the operations of new or expanded port facilities, it is less obvious how those facilities will affect employment and income levels in the aggregate in Washington. If exporting coal makes it more economical to ship other products through the newly constructed terminals than would otherwise be the case, the proposed coal port facilities could stimulate more exporting of other goods, including those produced in Washington, and therefore promote further increases in incomes and employment levels in the state. While increased imports might be seen as a source of competition for Washington State producers, and therefore a bad thing for the state's economy, this mercantilist view of trade is misguided. Indeed, if increased imports are a source of lower cost inputs to domestic manufacturers, or if increased trade volumes lower the costs of importing key inputs, the Gateway Pacific and Longview facilities will strengthen the competitive position of domestic producers in the longer-run. Furthermore, if lower cost transportation makes imported final goods consumed but not produced in Washington less expensive, Washington State consumers would be unambiguously better-off.

Section 5 addresses the outlook for increased international trade through the Gateway Pacific and Longview facilities. While synergies might exist between exporting coal and exporting (and importing) other products through those ports, the growth of trade flows through the ports will also be a function of the growth of overall international trade, particularly between the United States and Asia. Hence, Section 5 considers prospects for future growth in trade between Asian countries and the United States. Strong future growth in trade between Asia and the United States should increase

the demand for port capacity in Washington, which, in turn and other things constant, should increase the direct and indirect economic benefits of the Gateway Pacific and Longview facilities. To be sure, those ports will face competition from existing ports on the West Coast, particularly those in British Columbia. Hence, Section 5 also discusses whether prospective trade flows can be as efficiently handled by existing or proposed port capacity in British Columbia as by new terminals at Cherry Point and Longview. A brief summary of the report is provided in Section 6.

# THE ROLE OF INTERNATIONAL TRADE IN THE ECONOMY OF THE PACIFIC NORTHWEST

International trade plays a disproportionately important role in the Washington State economy compared to most other regions of the United States. This is a potentially important background observation to any consideration of increasing coal exports through ports located in that state. Specifically, unless the industrial structure of the Washington State economy changes substantially in the future, the growth of international trade must be seen as a vital contributor to improved real income levels in that state. Furthermore, the growing importance of Asian countries in global international trade combined with the prominent advantages that ports in the Northwest enjoy with respect to servicing trade flows between Asia and North America points to the potential for even larger real income benefits from international trade than the past.

## Washington's Trade Intensity

Table 1 highlights the relative trade intensity of Washington State compared to other parts of the United States. Specifically, it reports total exports per capita and imports per capita for Washington and for the United States a whole for the years 2011 and 2012. As can be seen from Table 1, Washington's exports per capita were almost twice as high as that for the entire United States in 2011 and more than twice as high in 2012.<sup>2</sup> Conversely, imports per capita for Washington were actually slightly lower than for the United States as a whole in those two years. As a result, total trade (exports plus imports) per capita for Washington was 36 percent higher

than for the United States as a whole in 2011 and 45 percent higher in 2012.

It should be explicitly noted that total exports for both Washington and the United States include goods that are "consolidated" domestically for shipment abroad. That is, U.S. export values include the value of inputs from outside the country, while Washington State export values include the value of inputs from outside the state. Hence, the export estimates reported in Table 1 should not be interpreted as strictly measuring the value added created in Washington or in the United States. Nevertheless, and as shall be discussed in more detail in a later section, employment and income are created in Washington from exporting goods whose value added is created (in part or in whole) outside of the state. Similarly, the state realizes economic benefits from facilitating imports of goods, including imports that are used by companies in Washington State.<sup>3</sup>

## Leading Exports and Imports

Table 2 reports the leading merchandise and commodity exports for Washington in 2011, while Table 3 reports the leading merchandise and commodity imports for that same year. Transportation equipment is clearly the single most important state export reflecting the prominent role that Boeing Corporation plays in Washington's economy. While assembled airplanes are not shipped to customers through seaports in Washington State, seaports are indirectly relevant

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<sup>2</sup> Estimates of exports and imports were obtained from the U.S. Department of Commerce, *U.S. International Trade in Goods and Services*, <http://www.census.gov/foreign-trade/data/index.html>. The population estimates for 2012 were obtained from U.S. Department of Commerce, *State and County Quick Facts*, <http://quickfacts.census.gov/qfd/states/53000.html>. It should be noted that 2012 population estimates were used to calculate per capita trade values for both 2011 and 2012.

<sup>3</sup> In this regard, the Washington Council on International Trade (2012) has estimated that 40% of all jobs in Washington State can be attributed to trade-related activity.

to the export of aircraft, since machinery and equipment used in Boeing factories are transported by ships to Northwest ports. Furthermore, Washington has a diverse range of export industries, and many of these, such as legumes and grains, ship through seaport facilities. On the import side, oil and gas is the single largest imported commodity. Since oil and gas is largely imported from Canada and transported via pipeline, seaport facilities are not relevant to this import activity; however, like exports, imports are comprised of a diverse range of goods and commodities such that seaports and complementary infrastructure such as rail are important to facilitating their shipment.

## Leading Trade Partners

The top ten geographical destinations for Washington State exports in 2012 are identified in Table 4, while the leading geographical sources of imports into Washington are summarized in Table 5. As shown in Table 4, China is the leading destination country for Washington's exports with Japan in second place. These two countries alone accounted for approximately 31 percent of total Washington exports in 2012. On the import side, Canada is

the single largest source of imports; however, China, Japan, South Korea and Taiwan collectively accounted for slightly less than 40 percent of total imports in 2012. In short, and as might be expected, Asia is a major partner for Washington State exports and imports.

The importance of Asian countries as destination and source locations for Washington's exports and imports is likely to become even more prominent in the future. One reason is that real economic growth in Asia is expected to outpace real economic growth elsewhere in the world for the foreseeable future. Empirical models of international trade show that trade between countries is largely a function of the sizes of the trading partners. Hence, as Asian countries become larger through economic growth, they will engage in more trade with their traditional trading partners, all other things constant. A second reason is the potential for a free trade agreement to be completed between the United States and some (possibly most) of its Asia-Pacific trading partners as a consequence of the current negotiations currently being conducted under the auspices of the Trans-Pacific Partnership (TPP) discussed in more detail in a later section.

# THE COST STRUCTURE OF PORTS

Before considering the likely cost structure of the Gateway Pacific and Longview facilities, as well as the economic implications of those facilities, it is worthwhile to briefly outline the nature of the proposed investments. The proposed Gateway Pacific project involves a terminal with two bulk materials handling and storage areas with rail loops for unit train access, as well as a 2,890 foot-long wharf and three ship berths to handle large dry bulk vessels, along with a trestle and conveyor system that connects the wharf to the terminal. At planned capacity, the terminal can handle 54 million metric tons of dry bulk material annually including grain and other bulk products in addition to coal. The project will be located at the Cherry Point industrial area in Whatcom County in Washington State.

The Millenium Bulk Terminals project at Longview, Washington contemplates upgrading an existing import/export bulk facility, as well as constructing a coal receiving, storage and shipping terminal. The new coal export terminal operating at its proposed capacity will be capable of handling 44 million metric tons of coal per year. The Millenium facility is located in Cowlitz County in Washington State.

To the extent that the terminals at Cherry Point and Longview make it cheaper to export and import other goods besides coal from and to Washington, the operation of those terminals will likely have broad-based economic impacts for producers and consumers in Washington. Specifically, there will be more exports from Washington State, including products produced in the state, as well as more imports into the state, including products that will be consumed in the state, than would be the case if the proposed investments were not made.

A key consideration in this regard is, therefore, whether building and operating new coal terminals will reduce the costs of shipping other goods into and out of Washington State below what they would be otherwise. The relevant issue here is whether the fixed (and likely sunk) costs of building a new coal terminal will result in lower average costs for increased shipments of other commodities. Several possibilities are potentially relevant in this regard. For example, the planned expansion at Cherry Point might share new transportation infrastructure with adjacent piers of other businesses including the BP Cherry Point refinery and the Alcoa-Intalco and Conoco Phillips facilities. If that infrastructure would not be built in the absence of the new coal terminals, or if the infrastructure would be less efficiently utilized, say because it would not be utilized to full capacity absent an operating coal terminal, the construction and operation of the new coal terminal creates a “windfall” efficiency gain for shippers of other products.

## Coordinating Investments

It might be argued that the operators of existing facilities adjacent to the proposed coal terminal could make the necessary investments in expanding transportation infrastructure on their own. Hence, it would be misleading to credit the investment in the new coal terminal with lowering the transportation costs faced by those adjacent facilities, since those investments would presumably be made eventually by other businesses if they were advantageous to make. There are two responses to this line of reasoning. First, some infrastructure investments are “lumpy.” That is, volumes must reach a certain level before the investments are economically

justified. In some circumstances, adjacent operators will not approach the operating volumes needed to justify infrastructure expansion on their own, but expansion could be justified given that their volumes are additive to coal volumes. An example is the proposed double tracking of a rail spur to Cherry Point. The project would benefit both the extant BP refinery and the Gateway facility, but it will only be built if Gateway goes ahead.<sup>4</sup>

Second, one might observe that investing in fixed and location-specific assets such as transportation infrastructure is very risky. In particular, the original investor, say a railroad operator, would be facing the risk that potential users of the railroad will either renege on or try to renegotiate agreed-upon freight rates once the railroad operator installs (and pays for) the new infrastructure. On the other hand, the operator of a new coal terminal has itself made a substantial sunk cost investment that would not be able to operate without complementary infrastructure such as a rail line. In this case, the railroad operator faces less risk of a major customer acting opportunistically. In other words, infrastructure investments that increase the transportation capacity serving adjacent (to the coal terminal) facilities are more likely to be made given the investment in the coal terminal than absent that investment, even if the expected benefits of the increased capacity to those adjacent facilities are the same whether or not there is an operating coal terminal.

## Cost Complementarities

In fact, it is likely that any new transportation infrastructure is more efficient if it serves more shippers, at least up to a point, given that there are usually economies of scale in transportation.

For example, the carrying capacity of railroad lines increase disproportionately to the amount of track bed and related infrastructure installed, since railroads can add additional trains and run longer hours as a means of carrying more cargo on a given route. Alternatively, once a main rail line is run into a large port facility, to serve a major terminal, adjacent terminals can access that main line through much cheaper spur lines that connect to the main line. Unless the capacity of the main line is fully utilized by the original terminal customer, adjacent terminal customers can share the use of the main line. The result is that average costs of shipping will decline as more is shipped from the terminals sharing the railway infrastructure; at least until full capacity utilization is realized.

Cost complementarities across a given set of port terminals handling different products can arise from sharing not only railroad infrastructure capacity, but also from sharing other infrastructure and services used by terminal operators such as harbor maintenance, tugboats and so forth. Economists identify such cost complementarities as economies of scope. Economies of scope exist when it is less expensive to produce two or more products together than it is to produce each product separately. For example, in the context of an individual seaport, economies of scope would exist if it is cheaper to process different types of bulk commodities in the same port rather than build and operate specialized ports to handle individual bulk commodities. The existence of economies of scope imply that there are efficiency gains to operating the new coal terminal at Longview alongside an upgraded bulk terminal than it would be to operate the terminals as independent facilities. Both the coal terminal and the upgraded bulk terminal share those cost savings which, in turn, are likely to be passed through to shippers and their customers.

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<sup>4</sup> Double tracking allows for dedicated inbound and outbound lines which increase both safety and efficiency. See John Stark (2012), "BP taking next steps on rail projects for crude oil", *Bellingham Herald*, November 30.

Cost complementarities or economies of scope also suggest that utilizing the new terminal for handling alternative bulk commodities is unlikely to be significantly more costly than utilizing the terminal exclusively for coal exports. The same argument holds true for the planned establishment of both a coal and dry bulk terminal at Cherry Point.

## Economies of Scale

Another cost characteristic relevant to understanding the organization of an industry involves economies of scale. Economies of scale in a production process exist when increased production of good results in lower average costs after allowing the producer to vary any or all of the relevant inputs. In the context of an individual seaport, economies of scale can be equated to reductions in the average cost of processing coal and other bulk commodities as the physical volume of commodities handled increases. Hence, if economies of scale exist beyond the current planned long-run capacities of the Gateway Pacific and Longview ports, expansion in the future will lead to lower average costs and presumably lower prices for shippers using those facilities.

It is useful to distinguish internal economies of scale from external economies of scale. As noted above, internal economies of scale refer to decreasing unit costs realized by an individual firm (or port in this case) as the volume of output increases. External economies of scale refer to decreases in unit costs of a set of firms as the volume of output produced by any one firm increases. External economies of scale can arise from firms sharing technology or highly specialized inputs, among other factors. In the context of seaports, such economies might arise, for example, from ports cooperating in promoting

and marketing their services to shippers, researching and addressing environmental concerns related to shipping and so forth.<sup>5</sup>

To the extent that the Cherry Point and Longview facilities would experience economies of scale as they expanded beyond their initial planned capacity, shippers using those ports would enjoy lower unit costs. Presumably this would encourage increased volumes of products to be shipped through those facilities. Furthermore, to the extent that the increased volume of shipments going through the relevant terminals was additive to the shipments handled by other Washington State ports, the Gateway Pacific and Longview terminals would contribute to the overall growth of international trade for Washington, over and above the currently anticipated volume of coal exports. In addition, if external economies of scale characterize the operations of seaports along at least a portion of the West Coast, the growth of the facilities at Cherry Point and Longview might convey additional cost advantages to other ports in Washington State.

Given the much larger sizes of the ports of Seattle and Tacoma compared to the plausible prospective sizes of the Cherry Point and Longview facilities, it is likely that the operations of the latter two facilities would contribute very modestly to operating efficiencies at the ports of Seattle and Tacoma.<sup>6</sup> Hence, the most relevant empirical issues are whether the Gateway and Longview facilities are characterized by internal economies of scale and economies of scope, as well as whether the growth of exports and imports through the port would likely come at the expense of established seaports in Washington.<sup>7</sup> In the following section, evidence on cost conditions in seaports is briefly reviewed.

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<sup>5</sup> For a discussion of sources of external economies of scale in port facilities, see T. Heaver, H. Meersman and E. Van De Voorde (2001), "Co-Operation and Competition in International Container Transport: Strategies for Ports", *Maritime Policy and Management*, 28 (3), pp. 293-305.

<sup>6</sup> There might be some efficiency gains to the Seattle and Tacoma ports if congestion at the port sites was reduced through more shipping going through new port facilities.

<sup>7</sup> Given the current capacity utilization rates at the ports of Seattle and Tacoma, as well as traffic-related and other constraints on significant expansions of those ports, it is very unlikely that the operation of the proposed Cherry Point and Longview ports will "cannibalize" shipping activity through those ports.

## Evidence on the Cost Structure of Ports

There is some limited empirical evidence on the nature of economies of scale and scope for ports. Economic activity within a port has multiple dimensions including administration, pilotage, towage, cargo handling and ship repair, among others; however, infrastructure and cargo handling services account for most of the charges incurred for vessels that arrive at ports for loading and unloading.<sup>8</sup> Hence, the provision of port facilities and cargo handling tend to be the focus of econometric studies of the cost structure of ports. Both the provision of port facilities and cargo handling are themselves multi-output activities, as freight can take the form of containers, bulk, roll-on; roll-off or non-containerized general cargo. Some available studies consolidate the different types of freight into a single output measure such as TEUs or annual cargo tons. Others use output vectors that identify different types of freight.

Tovar, Jara-Diaz and Trujillo (2007) conclude from their review of the literature that there exists increasing internal returns to scale associated with the provision of services provided by port infrastructure, although there are differences in the estimated scale economies depending upon how output is measured and whether the specification of the model allows for economies of scope. They also cite evidence of economies of scope in the handling of bulk and general cargo, as well as cost advantages resulting from the joint handling of containers, general cargo and roll-on; roll-off cargo within ports with multi-purpose terminals. While they caution that their results are drawn from a limited number of available studies, they conclude that both infrastructure and cargo handling services

are characterized by increasing returns to scale. Furthermore, there are economies of scope between cargo types for both infrastructure and cargo handling services.

The conclusions in the academic literature that there are economies of scale and scope in port operations are supported by observed practices in the Pacific Northwest. Ports on Canada's West Coast are examples. The Port of Prince Rupert in Northern British Columbia has undergone substantial development over the recent past. A coal terminal and a grain terminal were established in the 1980s, and a container terminal and cruise terminal were established within the last decade. At present, a number of projects are underway or being considered, including facilities to handle wood pellets, potash and LNG, as well as expansion of the coal and container terminals.<sup>9</sup>

Similarly, Port Metro Vancouver supports multiple terminals and claims to be the most diversified port in North America.<sup>10</sup> Its operations include the Port of Vancouver, several terminals on the Fraser River and the super port at Roberts Bank. Terminal services include bulk (mainly coal, grain, sulfur and potash), break-bulk (mainly steel, wood pulp and lumber), containers, automobiles and cruise ships. Many of these terminals are adjacent and use common inputs (e.g., tugs, pilots, dredging services, inbound and outbound rail and road infrastructure and so forth). There are also projects planned or underway to expand capacity, in particular coal, grain and container handling capacity.<sup>11</sup>

The experience of the Canadian ports supports the proposition that there are economies of scale and scope in port operations. If there were diseconomies of scale in specific terminal operations, one would not expect to see continuous expansion of extant

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<sup>8</sup> See Beatrice Tovar, Sergio Jara-Diaz and Lourdes Trujillo (2007), "Econometric Estimation of Scale and Scope Economies within the Port System: A Review", *Maritime Policy and Management*, 34 (3), pp. 203-223.

<sup>9</sup> Prince Rupert and Port Edward Development Corporation, webpage: [http://www.predc.com/page?id\\_page=189&id\\_section=2](http://www.predc.com/page?id_page=189&id_section=2).

<sup>10</sup> Port Metro Vancouver webpage: <http://www.portmetrovancover.com/en/about/portoverview.aspx>.

<sup>11</sup> Port Metro Vancouver, Projects and Planning, webpage: <http://www.portmetrovancover.com/en/projects.aspx>.

services. If there were diseconomies of scope, one would not expect to see ongoing and substantial diversification of the services offered by the ports.

An implication of this empirical evidence is that expansion of an initially dedicated coal port will likely result in lower unit costs for additional shipments of coal through the port over a substantial magnitude of coal shipments. Furthermore, there will be efficiency gains associated with shipping other products through the port.<sup>12</sup> That is, it should be cheaper to expand an established coal port into a multi-purpose port in order to export and import

a given overall tonnage of products than to build new dedicated ports to export and import non-coal products. These observations support claims that the proposed terminal facilities at Cherry Point and Longview can efficiently expand and alter freight mixes as market forces dictate. As a consequence, the economic contributions of the proposed facilities to Washington State may be larger and more industrially widespread over time than is suggested by a strict focus on the local economic impacts of planned coal exports through those facilities.

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<sup>12</sup> It should be emphasized here that the efficiency gains are realized by shippers and their customers. Issues related to possible environmental costs or delays imposed on other users of surface transportation are ignored in this discussion.

# ECONOMIC BENEFITS OF INTERNATIONAL TRADE

Basic models of international trade identify the benefits of such trade for a nation. The benefits are primarily higher real income levels resulting from nations specializing in producing products for which they enjoy relative low costs and importing products for which they suffer relatively high costs. In addition, specialization at the level of individual products creates benefits for consumers in the form of a greater variety of products to consume, as well as products of higher quality than those produced in the home market. Finally, the increased competition associated with international trade promotes improved productivity amongst domestic producers competing with foreign suppliers.

While the evidence is conclusive that international trade promotes higher real income levels for trading nations as a whole, the evidence does not support a conclusion that all workers and consumers in a country or region benefit from increased international trade. Indeed, the unequal distribution of benefits and costs of international trade creates opposition to trade facilitating initiatives in specific cities and regions of a country. While economic efficiency dictates that major investment projects be evaluated from broad national, or even international perspectives, political dynamics often mean that benefit-cost and economic impact analyses must show significant income and employment gains for more narrowly defined geographic regions. In this context, the Cherry Point and Longview port proposals will need government approvals at the local and state levels to be built and operated. Hence, the economic consequences of the two port facilities at both the local and state levels are relevant.

Several studies are available that identify the economic impacts of the planned Cherry Point and Longview terminals.<sup>13</sup> It should be noted that economic impact studies do not focus exclusively on the contributions of investments to real economic growth. Rather, they look at various outcomes of the relevant investments for a number of macroeconomic variables including employment and taxes, as well as incomes. Since employment is a vehicle for creating income, and taxes are transfers of income from some residents to others, the estimated growth in real incomes associated with the planned terminals come closest to identifying the standard economic measure of the social welfare benefit of investments in infrastructure, i.e., real economic growth.

## Economic Impact Studies

Studies of the economic impacts of seaports generally identify four broad categories of impacts: 1. Direct; 2. Indirect; 3. Induced; 4. "Catalytic".<sup>14</sup> The direct impacts are the employment and income generated by the direct construction and on-going operation of the port. The indirect impacts are the employment and income generated by the chain of suppliers of goods and services to the port once it is operating. The induced impacts refer to the employment and income generated by the spending of incomes created by the direct and indirect effects, or what is typically referred to in the literature as the multiplier effect. Finally, the catalytic impact encompasses the employment and income generated by the port in its role as a driver of efficiency improvements in "upstream" industries.

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<sup>13</sup> Two impact studies of the Gateway Pacific project are found in Martin Associates (2011), "The Projected Economic Impacts for the Development of a Bulk Terminal at Cherry Point", <http://gatewaypacificterminal.com/wp-content/uploads/2011/11/MartinReport10271ForPrint.pdf> and Finance and Resource Management Consultants, Inc. (2011), "Review of Martin Associates Economic Impact Study", <http://gatewaypacificterminal.com/wp-content/uploads/2012/04/FRMC-Review-of-Martin-Report-10.24.11.pdf>. An impact analysis of the Longview project is provided in BERK (2012), "Economic & Fiscal Impact Assessment of Millennium Bulk Terminals". [http://millenniumbulk.com/wp-content/uploads/2012/04/Economic\\_study-Full\\_Report.pdf](http://millenniumbulk.com/wp-content/uploads/2012/04/Economic_study-Full_Report.pdf).

<sup>14</sup> The four impacts, as well as the definition of the term "catalytic" are discussed in Sibel Bayan Caglak, Gulsum Aydin and Guler Alkan (2011), "The Impact of Seaport Investments on Regional Economies and Developments", *International Journal of Business and Management Studies*, 3 (2), pp. 333-339.

Several available studies estimate what is identified above as the direct, indirect and induced effects of the Cherry Point and Longview projects for the economies of Whatcom and Cowlitz counties, although they measure the induced effects separately for the construction and operating phases of the ports. Hence, the Martin Associates (2011) study first estimates the annual increase in income from the construction and operation of the Cherry Point terminal during its initial (Phase 1) stage at around \$91 million. It then estimates the annual increase in income associated with operating the terminal at its current planned capacity (Phase 2) as being around \$126 million. The Berk (2012) study focuses on the economic impacts of the coal export terminal in Longview. It clusters the identified income gains into three broad stages of the project: construction, operations during the first stage and operations after planned build out is realized. The construction phase is forecast to generate around \$203 million in output (or income) from the direct, indirect and induced impacts. Stage 1 operations are anticipated to produce \$40 million in additional output (or income) per year, while the annual increase in output (or income) after full build out is \$70 million.

It is useful to emphasize what the impact studies reviewed above focus on, as well as what they do not. The estimated growth in real income arises from four main sources: 1. Wages, salaries and profits earned by local factors of production associated with construction of port facilities; 2. Wages, salaries and profits arising from secondary spending by local factors of production from incomes earned in construction activities (construction stage multiplier effect); 3. Wages, salaries and profits arising from the operation of the port facilities, as well as supporting transportation services such as railroads, towing and pilotage and so forth; 4. Wages, salaries and profits

arising from secondary spending by local factors of production from incomes earned from operating the port facilities, as well as from supplying services complementary to operating the port facilities (port operation multiplier effect). The available studies do not focus on what was earlier referred to as the catalytic impacts.<sup>15</sup>

Once operating, the Millennium and Cherry Point terminals will provide transportation services to exporters and importers including those that are resident in Washington State. These transportation services obviously have economic benefits to those exporters and importers. Furthermore, the economic benefits of those services are not fully captured by the salaries, incomes and profits projected to be earned by factors of production supplying direct and indirect input services to the port facilities. New and efficient transportation services create value for exporters and importers directly by lowering the costs of shipping goods to customers and receiving goods from suppliers. The transportation cost savings, in turn, can therefore be a source of higher incomes and salaries paid to suppliers of inputs to exporters and importers (including suppliers of inland transportation services), as well as higher profits to owners of the relevant businesses involved in international trade. New port transportation services can also create value for exporters and importers by reducing the time it takes to ship goods which, in turn, can enable exporters to charge a higher price to customers and allow importers to save money by holding lower inventory levels. These efficiency improvements also produce higher profits for exporters and importers which, over time, may be passed through to factors of production and consumers in the form of higher incomes and lower prices.

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<sup>15</sup> Berk (2012, p.27) does mention the possibility that the Longview project will encourage rail improvements parallel to the Columbia River and near the Millennium site which could spur new industrial development in Cowlitz County.

In effect, new and efficient port transportation services allow exporters and importers to operate more efficiently which creates increased income in those businesses. Only a portion of the efficiency gains will be captured by port operators in the prices that they charge for the transportation and related services supplied to the exporters and importers. Indeed, the economic value of the efficiency gains must, on average, exceed the incremental costs of transporting those exports and imports through the ports or the transportation services would not be acquired.<sup>16</sup> The portion of the efficiency gains that is not captured in port-related charges represents an income surplus that is not typically discussed in port impact studies. This income surplus can be likened to consumer surplus in traditional models of consumer demand. Consumers are willing to pay higher prices for new products that are improvements over existing products; however, competition usually ensures that consumers do not have to pay prices that are commensurate with the increased value they place on the new products. This residual is called consumer surplus.

Put simply, more efficient shipping alternatives allow exporters and importers to earn economic profits (or surplus). The increase in economic profits might be thought of as a short-run catalytic impact of port infrastructure investment. The greater the efficiency advantages of new shipping alternatives, the greater should be the surplus, other things constant.

Over time, if exporters and importers can take advantage of efficiency improvements in transportation and, consequently, earn higher profits, expansion should take place in the export and import businesses affected. This expansion will generate increased incomes for the factors of production that are hired, as well as lower prices for consumers of the products affected. For example, if

exporters of wheat through the Millennium port can lower transport costs by doing so, and thereby earn higher profits, they should be willing to expand the amount of wheat they produce and, in the process, hire additional factors of production to produce the additional wheat. The additional income created as a consequence might be considered a catalytic impact of the Millennium facility. To the extent that the increase in wheat supply also results in lower wheat prices, consumers of wheat will enjoy the equivalent of an increase in their monetary incomes. The increases in income enjoyed by factors of production and consumers from the expansion of production in upstream industries can be thought of as a longer-run catalytic impact of new shipping alternatives.

As an example of this longer-run catalytic impact, imagine that farmers import a bulk chemical used to protect crops against damage and that it is more efficient to use one of the new port facilities to import the chemical than to use an already existing facility. The short-run impact is that the importers should realize some of the resulting cost savings in the form of increased profits. The increase in profits should, over time, encourage an expansion of the sector using the import, in this case an expansion of the relevant farming activity. The expansion will result in increased incomes for the factors of production employed to facilitate the expansion. It should also result in lower prices for consumers of the farm product in question.<sup>17</sup>

The expansion of exporting and importing businesses stimulated by improved transportation alternatives might itself promote additional efficiency gains in those businesses. The relevant notion here is external economies of scale mentioned earlier in the context of expanding the number of operating ports in the Pacific Northwest.

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<sup>16</sup> Assuming competition, the incremental costs of operating a terminal(s) is implicitly measured in impact studies as the salaries, incomes and profits earned by factors of production used to operate the port.

<sup>17</sup> The degree to which consumers experience lower prices as an industry expands production depends upon how average costs in that industry change in the long-run with increases in output.

External economies of scale are gains in efficiency that result from increased production by a group of producers in an industry or in a given geographical location. External economies of scale arise from two main sources: 1. as an industry or location gets larger, it becomes more economical to have specialized inputs serve that industry or location. For example, wheat production in a given location might be too small an activity to support financially a specialized (to wheat farming) research facility; however, once production activity (and revenues) exceed critical thresholds, producers can justify financially supporting the specialized facility, as opposed to, say, relying exclusively upon the advice of less specialized sources such as seed retailers. Presumably, the resulting improvements in efficiency benefit most or all of the producers in the relevant industry or location: 2. as an industry or geographical location engages in more economic activity, “denser” networks of contacts and information arise. Put simply, the potential for collaboration across organizations grows exponentially as the number of organizations and experts increases. As information networks become denser, innovation improves and technology diffusion accelerates. The end result is improved efficiency.

By contributing to improved efficiency in an industrial sector or specific location, external economies of scale should encourage further

additional increases in production (and income created) in the industrial sectors or locations in question.<sup>19</sup> In this context, the expansion of production (and income) stimulated by efficiencies linked to capturing external economies of scale might be seen as “second-round” longer-run catalytic impacts of the availability of more efficient transportation alternatives supplied by new port facilities. Obviously, the more prominent are external economies of scale, the more substantial and widespread the economic development impacts on the sector(s) or location in question. For example, a substantial expansion of the agricultural sector in a given location might lead to the development of new businesses in supporting services such as intermediaries specialized in financing agricultural activities and software developers focused on farm management applications.<sup>20</sup>

While it is not possible in this report to put forward any estimates of the short-run and longer-run catalytic impacts of the proposed facilities at Longview and Cherry Point, it is possible to conclude that such impacts will exist and that they have not figured very prominently, to this point, in the public policy debate surrounding the net social benefits of those facilities.

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<sup>18</sup> By way of illustration, imagine that there are only 2 producers in an industry. Collaboration on activities such as innovation, cooperative marketing and so forth can only occur between the two producers. Now imagine that a third producer enters the industry. The two existing producers can continue to collaborate. At the same time, each can collaborate with the new entrant. In effect, the entry of a single new producer created two new “channels” for cooperation.

<sup>19</sup> The potential for further price reductions to consumers must also be mentioned.

<sup>20</sup> As income is created through the expansion of an industry, in this case an agricultural product, some portion of the income will be spend on goods produced outside that industry, i.e. the traditional consumption multiplier.

# OUTLOOK FOR GROWTH IN TRADE THROUGH PROPOSED PORTS

The analysis to this point assumes that capacity of the proposed Washington State ports will, in fact, represent a more efficient transportation alternative for some exporters and importers of bulk commodities besides coal companies and that an international market will exist for those exporters and importers. There are two possibilities to consider in this regard. One is that the growth of international trade in bulk commodities will be significantly slower than anticipated so that efficiency improvements in transportation are partially or totally “neutralized” as a stimulus for the catalytic impacts discussed above by a decrease in demand for internationally traded bulk goods. A second is that the new facilities offer only a very small improvement in shipping options available to exporters and importers using existing Northwest ports. Either of these possibilities would reduce the catalytic benefits of the proposed port facilities.

## Outlook for Growth in the International Trade of Bulk Commodities

So-called gravity models of international trade link the growth of international trade primarily to the real economic growth rates of the trading partners. In the context of Washington State, the volume of exports and imports passing through Washington ports will depend importantly upon the future real economic growth rates of the United States and the countries that account for exports and imports shipped through Washington ports. In an earlier section, the main countries receiving exports shipped through Washington ports, as well

as the main countries exporting to the U.S. through Washington ports were identified. Table 6 reports forecast real growth rates for those countries, as well as two other countries (India and Indonesia) that represent increasingly important trading partners for the U.S. and for which trade through Northwest ports is promising.

The long-term growth projections reported in Table 6 are based on estimates of growth in the population of working age; increases in human capital proxied by average education levels across the adult population; growth in the physical capital stock and total factor productivity. The projections are of real GDP in billions of 2011 U.S. dollars converted at Purchasing Power Parity (PPP) currency values.<sup>21</sup> GDP at PPP is arguably a better indicator of average living standards or levels of real output because it corrects for price differences across countries at different levels of economic development. Typically the currencies of developing countries are undervalued relative to their PPP values. Evidence also suggests that the real value of the exchange rates of developing countries will increase over time towards their PPP values which should, other things constant, encourage increased exports to developing countries from developed countries.

It should be explicitly acknowledged that the real long-term economic growth estimates summarized in Table 6 are from a single, albeit, well respected source of such estimates. While different forecasts of real growth for the countries involved can be identified, the forecasts in Table 6 are not inconsistent with long-run economic

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<sup>21</sup> See PwC Economics (2013), “The World in 2050: The BRICs and Beyond: Prospects, Challenges and Opportunities”, [http://www.pwc.com/en\\_GX/gx/world/assets/pwc-world-in-2050-report-January-2013.pdf](http://www.pwc.com/en_GX/gx/world/assets/pwc-world-in-2050-report-January-2013.pdf).

outlooks reported elsewhere, particularly for China. Specifically, it is a fairly consistent viewpoint that real economic growth in China will continue at recent rates of growth over the next two decades or so. After that, a slowing growth of the labor force owing to demographics, as well as the exhaustion of the movement of underemployed rural workers to urban labor markets, will lead to significantly slower real economic growth rates in China after 2030. The resulting higher labor costs in China will likely result in more offshore outsourcing being done in countries such as Vietnam and Indonesia. As a consequence, other Southeast Asian economies are likely to experience relatively rapid economic growth and will likely emerge as increasingly important trading partners with the United States.

The main inference to draw from Table 6 is that real economic growth is expected to continue in the national economies that are the main sources and recipients of U.S. imports and exports passing through Washington State ports including China, Japan, South Korea and Mexico. In addition, the potential for accelerated real economic growth in "rival" (to China) Southeast Asian countries, including Vietnam and Indonesia, promises a corresponding acceleration of trade growth between those countries and the United States. All other things constant, this suggests that trade volumes between the U.S. and Asia will continue to grow, along with the need for expanded port capacity in the United States.

## Trans-Pacific Partnership

The Trans-Pacific Partnership (TPP) is a consortium of countries including the United States and eleven other countries in the Asia-Pacific region that is negotiating reductions in barriers to trade with the

goal of creating a free trade agreement among the countries.<sup>22</sup> At present, another trade negotiation (Regional Comprehensive Economic Partnership-RCEP) is going on in parallel with the TPP. The RCEP includes several countries that are also participating in the TPP; namely, Australia, Japan and New Zealand. However, the RCEP also includes China and South Korea which are not participants in the TPP and which are major trading partners with the U.S. and with Washington State specifically. It is unclear how the two trade initiatives will impact each other and, particularly, whether they might lead to a free trade agreement involving all or most countries involved in the two negotiations.

Obviously, a free trade agreement involving all countries currently negotiating within the frameworks of the TPP and RCEP would be a very big deal for trade between Asia and the United States, particularly since it would bring China and India into a free trade agreement with the United States. However, even the TPP itself promises to have significant consequences for U.S. international trade. For one thing, it would bring in partners (Malaysia, Vietnam and Japan) with which the United States currently does not have extant bilateral free trade agreements. U.S. agricultural and food marketing businesses in particular view quite positively the prospect of further opening of agricultural product and food markets in the three countries.<sup>23</sup> Malaysia and Vietnam enjoy expanding populations and growing real income levels which should stimulate increased demand for U.S. food products. The removal of existing Japanese barriers to U.S. agricultural and food products would allow increased sales in a large and very wealthy market. For another thing, though U.S. trade with two other TPP members (Canada and Mexico) is mostly free, a free trade agreement within the TPP context might create new opportunities for U.S. dairy and poultry

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<sup>22</sup> Japan recently gained the unanimous backing of the members to become the 12th member of the talks, but it cannot take part until the U.S. completes the 90-day notice required by Congress to admit it. Admittance is widely expected.

<sup>23</sup> See Ian Ferguson, William Cooper, Remy Jurenas and Brock Williams (2013), "The Trans-Pacific Partnership Negotiations and Issues for Congress", Congressional Research Service, <http://www.fas.org/sgp/crs/row/R42694.pdf>.

producers in the currently restricted Canadian market for those products, as well as address some non-tariff barrier issues that have arisen in exporting agricultural products to Mexico.

The inference that one might reasonably draw is that the negotiation of a comprehensive free trade agreement between the United States and Asian countries will expand international trade in many goods and services covered by the agreement, and the increased trade will create increased demand for port capacity on the U.S. West Coast, particularly to the extent that China joins any resulting free trade agreement of which the U.S. is a member. While not all products and services covered by an Asia-Pacific free trade agreement will have strong usage implications for port facilities and producers in Washington State, a number of key sectors covered and countries potentially included could have very substantial implications for the economy of Washington State and particularly for transportation infrastructure in the state, including seaports.

## Outlook for Trade in Bulk Products

As noted in the preceding section, projections for continued long-run economic growth in Asian countries, along with reasonable prospects for a free trade agreement involving most, if not all, Asia-Pacific economies creates a favorable potential for substantially increased trade utilizing transportation infrastructure in Washington. Furthermore, these two developments also expand opportunities for increased bulk commodity exports originating in Washington State, in particular agricultural products.<sup>24</sup> Table 7 identifies the main Washington State originated exports in 2012. As suggested in an earlier section, the presence of Boeing facilities in Washington makes aircraft and parts the state's

major originated export. However, the importance of agricultural products can be clearly seen with grain, flours, fruit and forage (hay, clover, etc.) accounting for almost 22 percent of all exports originating in Washington. Metal and wood-related products account for approximately another 4.5 percent of exports originating in the state. In short, other than aircraft and parts, bulk commodities, for which the Longview and Cherry Point terminals are arguably particularly efficient, are the major export products originating in Washington.

Figure 1 identifies the top countries that imported goods produced in Washington State in 2012. Specifically, it reports the percentage of all exported goods originating in Washington State going to the specific country identified.<sup>25</sup> The economic significance of an expanded Asia-Pacific free trade agreement is highlighted by the data reported in Figure 1, as is the importance of Asian trading partners more generally. Specifically, China and South Korea together account for slightly over 23 percent of exports originating in Washington State, and those are two countries that are not, as of yet, participants in TPP negotiations, as noted above. Reductions in trade barriers on the part of those two countries, as well as on the part of Japan, which will most likely participate in TPP negotiations, would improve the export environment in countries that currently account for around 35 percent of exports originating in Washington State.

There has been debate surrounding the outlook for exports of coal specifically. While the demand for coal in Asia is unlikely to be affected by the outcome of the TPP negotiations, and while coal exports would not originate in Washington State, the estimated direct, indirect and induced benefits of the proposed port facilities might be affected if coal export demand was significantly below

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<sup>24</sup> Drybulk cargo is generally categorized as either major bulk or minor bulk. Major bulk cargo constitutes the vast majority of drybulk cargo by weight and includes, among other things, iron ore, coal and grain. Minor bulk cargo includes products such as agricultural products, metal concentrates and other mineral products, cement, forest products and steel products. See Genco Shipping and Trading Limited, Drybulk Carrier Industry Overview, <http://www.gencoshipping.com/industry.html>.

<sup>25</sup> It again should be explicitly noted that some of the value added associated with products originating in Washington State may have been produced outside the state.

projections used by port planners, and if it any shortfalls in coal export demand were not replaced by exports of other bulk commodities. An extensive evaluation of the various positions on this issue is beyond the scope of this report. Suffice to say that there are both optimistic and pessimistic coal export forecasts for China, the intended main customer. However, projected economic growth in India makes that country a growing coal customer in the future. South Korea, Japan and Taiwan, with no domestic coal supplies, are large importers of coal and may be looking to diversify their sources of supply by importing Powder River Basin Coal that will be exported through the new facilities.<sup>26</sup>

The straightforward inference to be drawn is that the emergence of a comprehensive free trade agreement involving the U.S. and Asian trading partners would likely prove to be a substantial boon to trade passing through ports in Washington State and would likely mean that existing impact studies reviewed earlier underestimate the increased income in Washington State that will be directly and indirectly created the proposed coal ports including the income gains from catalytic effects as discussed above.

## Availability of Existing Shipping Options

As noted above, the economic impact of the Longview and Cherry Point facilities will depend, in part, upon how much of an efficiency advantage specific bulk shippers gain from using those ports rather than using already existing ports in the Pacific Northwest. The major ports in the Pacific Northwest include the U.S. ports of Seattle and Tacoma and the Canadian ports of Vancouver and Prince Rupert. It is forecast that total container volume shipped via

Pacific Northwest ports will increase from 7.1 m TEUs in 2011 to reach 13.7 m TEUs in 2025.<sup>27</sup> Total capacity in the Pacific Northwest at the end of 2011 amounted to some 12.1 m TEU/per year with Metro- Vancouver accounting for slightly over 30 percent of that total- or 36 percent if Portland and Alaskan ports are excluded. It is anticipated that container handling capacity for the range of existing Pacific Northwest ports will increase by some 29 percent over the period 2011 – 2020 based on planned terminal expansions.<sup>28</sup>

Using these projected estimates, available container handling capacity in the period 2020-2025 will be adequate to handle forecast container shipment demand; however, container capacity relative to container demand is not an ideal measure of whether the existing major ports in the Northwest are close substitutes to Longview and Cherry Point in handling bulk commodity shipments. One important consideration in this regard is that container port capacity is not well suited to handle bulk cargo, even though there has been an increasing use of containers in cargo sectors that have not historically been regarded as suitable for containers- for example, forest products, iron and steel scrap and waste paper.<sup>29</sup> The primary impetus has been the desire to “balance” incoming container shipments from Asia to North America with outgoing container shipments. The incoming shipments are largely manufactured goods that lend themselves well to containerization. While there has been some growth in the containerization of bulk commodities, it seems likely that barring unanticipated changes in technology or industry practices, further growth will be limited to niche market opportunities where product separation, e.g. different grades of grain, smaller batches, delivery time and accessibility are particularly important.<sup>30</sup>

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<sup>26</sup> For a discussion of the various outlooks for coal exports, see Scott Learn (2012), “Coal Clash: Proposed Northwest Export Terminals Face the Risky Business of Global Energy Markets”, *The Oregonian*, June 30.

<sup>27</sup> Ocean Shipping Consultants (2012), “Port Metro Vancouver Container Forecasts #P120330-10”, p.10. <http://www.robertsbankterminal2.com/wp-content/uploads/port-metro-vancouver-container-forecasts-ocean-shipping-co>.

<sup>28</sup> *Ibid.*, p.13.

<sup>29</sup> *Ibid.*, p.31.

<sup>30</sup> Jean- Paul Rodrique and Theo Notteboom (2011), “Looking Inside the Box: Evidence from the Containerization of Commodities and the Cold Chain”, Hempstead, New York: Hofstra University, mimeo.

The British Columbia ports of Westshore and Ridley are potential bulk port substitutes for the Longview and Cherry Point facilities; however, it can be argued that they are not close substitutes for several reasons. The Ridley Terminal is located in Price Rupert which means that U.S. shippers would incur substantially higher inland freight costs shipping to that terminal compared to the Cherry Point or Longview facilities. Westshore is an older designed port built on landfill in open water which makes it less efficient in principle than Cherry Point. In addition, U.S. shippers using Canadian ports face exchange rate risks that are not relevant when using U.S. ports.

The Westshore Terminal (at Roberts Bank) is currently operating at capacity and has limited potential to expand capacity for bulk commodities. There is a potential for expansion of The Fraser Surrey Docks in Vancouver, but that expansion would amount to a small increase in capacity (i.e. around

4 million tons). Neptune Terminal in Vancouver plans to undertake a 10 million ton capacity expansion, but the expansion is intended to handle metallurgical coal and not thermal coal. In short, prospective expansion of port capacity in the Lower Mainland would not seem to offer a close source of substitute capacity for the Cherry Point and Longview facilities.

It is worth noting that British Columbia's coal ports were developed in large measure to accommodate exports of metallurgical coal. There are projections of increased demand for both metallurgical coal, the main output of B.C. mines, and thermal coal, the main output of Western U.S. mines.<sup>31</sup> Given Ridley Island's proximity to Northeastern B.C. coal mines, and the established infrastructure in both Northern and Southern British Columbia to move metallurgical coal to port, it is likely that preference would be given to this product in the face of any capacity constraints.

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<sup>31</sup> Worley Parsons Canada (2011), "Projections of Vessel Calls and Movements at Deltaport and Westshore Terminals, Deltaport Terminal Road and Rail Improvement Project (DTRRIP)", Report prepared for Port Metro- Vancouver.

# CONCLUSIONS

Available estimates of the economic benefits of the proposed coal terminals at Cherry Point and Longview focus on the increased employment and income created by the construction and operation of the terminals, as well as by the spending from the income created from constructing and operating the terminals. These estimates generally do not include the increased income created in “upstream” sectors of the regional and national economies resulting from the expansion of those sectors that is, in turn, encouraged by increased efficiency in transportation resulting from the Cherry Point and Longview terminals.<sup>32</sup> As a result, existing studies identifying the economic benefits of the proposed coal terminals arguably underestimate those benefits, perhaps significantly, and also understate how broadly those economic benefits might be dispersed throughout the regional and national economies.

The upstream economic activity encouraged by the addition of efficient port capacity in Washington State will obviously benefit employees and shareholders of coal companies, as well as employees and shareholders of companies that

supply inputs and services to coal producers. Few of those employees and shareholders are likely to be residents of Washington State; however, there are upstream industries with production establishments in Washington State that are likely to be direct beneficiaries of more efficient (than existing) port transportation facilities as represented by the infrastructure at Cherry Point and Longview. Perhaps the most notable is Washington’s agricultural sector, although wood and metal products will also be advantaged. Consumers will share in the benefits of upstream industry expansion, and they include consumers in Washington State. Moreover, consumers will benefit from reductions in shipping costs for imported consumer goods, while businesses will benefit from lower cost imported inputs.<sup>33</sup>

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<sup>32</sup> A recently released study provides estimates of the contribution of all coal exports in 2011 to total employment, income and value added in the United States. One main finding is that for the U.S. in 2011, the total of all salaries wages and profits per short ton of coal exported was around \$155 million. Unfortunately, it is not possible based on the information provided to estimate what the economic impact would be from increased exports through the Cherry Point and Longview ports, presuming that those exports were incremental to exports moving through other U.S. ports. See Ernst & Young (2013), “U.S. Coal Exports: National and State Economic Contributions”, mimeo.

<sup>33</sup> It might be noted that the current business plan for Cherry Point projects that facility as exclusively exporting bulk products, although future imports cannot be ruled out. Author’s discussion with Mr. Craig Cole of Gateway Pacific Terminal.

## WASHINGTON'S TRADE INTENSITY

Table 1 | Exports and Imports per Capita (\$ Current)

	2011			2012		
	EXPORTS	IMPORTS	TOTAL	EXPORTS	IMPORTS	TOTAL
Washington	9,391	6,769	16,160	10,950	6,908	17,858
U.S.	4,770	7,122	11,892	4,938	7,325	12,308

Source: See Footnote 2

## LEADING EXPORTS AND IMPORTS

Table 2 | Top 10 Washington Export Industries, 2011 (\$ Billions, Nominal)

INDUSTRY	EXPORTS
Transportation Equipment	\$28.1
Agricultural Products	11.4
Petroleum and Coal Products	3.7
Computer and Electrical Products	3.7
Food and Kindered Products	2.9
Machinery (except electrical)	2.4
Primary Metal Manufacturers	1.8
Chemical Products	1.4
Waste and Scrap	1.2
Paper	1.2

Source: Washington Council on International Trade (2012)

**Table 3 | Top 10 Washington Imports, 2011 (\$ Billions, Nominal)**

<b>INDUSTRY</b>	<b>IMPORTS</b>
Oil and Gas	\$11.9
Transportation Equipment	9.0
Computer and Electrical Products	5.0
Miscellaneous Manufacturing	3.7
Machinery (except electrical)	2.1
Chemical Products	1.8
Apparel	1.5
Food and Kindered Products	1.1
Primary Metal Manufacturers	1.1
Electrical Equipment Appliances and Components	1.0

Source: Washington Council on International Trade (2012)

## **LEADING TRADE PARTNERS**

**Table 4 | Leading Destination Countries for Washington Exports  
(Percent of total exports – 2012)**

<b>COUNTRY</b>	<b>PERCENT</b>
Canada	29.1
China	17.8
Japan	12.9
Korea, South	4.6
Taiwan	4.1
France	3.5
UK	3.2

Source: See Footnote 3

**TABLE 5 | Leading Source Countries for Washington Imports  
(Percent of total imports – 2012)**

<b>COUNTRY</b>	<b>PERCENT</b>
Canada	29.1
China	17.8
Japan	12.9
Korea, South	4.6
Taiwan	4.1
France	3.5
UK	3.2
Waste and Scrap	1.2
Paper	1.2

Source: See Footnote 3

## **OUTLOOK FOR GROWTH IN THE INTERNATIONAL TRADE OF BULK COMMODITIES**

**TABLE 6 | Estimated Growth of GDP at PPP (2011 US \$ billions)**

	<b>2011 - 2030</b>	<b>2030 - 2050</b>
U.S.	55%	63%
China	170%	76%
Japan	33%	38%
South Korea	63%	45%
Mexico	108%	102%
India	203%	153%
Indonesia	158%	118%

Source: PwC Economics, The World in 2050

# OUTLOOK FOR TRADE IN BULK PRODUCTS

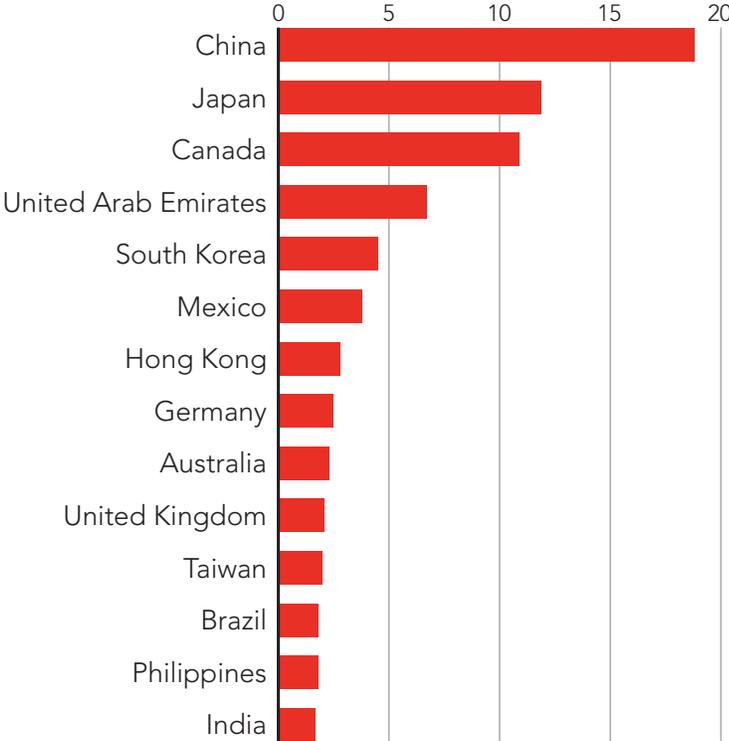
**TABLE 7 | State Exports for Washington (\$ US millions – 2012)**

<b>PRODUCT</b>	<b>\$ (MILLIONS)</b>
Civilian aircraft, engines, parts	36,720
Soybeans, wheat, corn	9,683
Fruit and other agriculture	1,857
Forage products, flours	923
Wood and paper products	1,281
Metal products	1,276
Petroleum oil/coke/bitumen	2,478
Powdered/solid milk and cream	223
Other	2,995

Source: United States Census Bureau, State Exports for Washington, <http://www.census.gov/foreign-trade/statistics/state/data/wa.html>

**FIGURE 1 | Top Countries Based on 2012 Dollar Value of Exports Originating in Washington State**

**Percentage of WA State-originated Exports**



Source: United States Census Bureau, State Exports for Washington, <http://www.census.gov/foreign-trade/statistics/state/data/wa.html>