

**Columbia Snake River System
and Oregon Coastal Cargo Ports
Marine Transportation System Study**

**Appendix B
Marine Cargo Forecasts**

Prepared for
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by
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Marine Cargo Forecasts

The following section provides a forecast of marine cargoes expected to transit the CEDER Port regions:

- Lower Columbia Region (includes the deep draft Ports of Portland, Vancouver, Kalama, Longview, St Helens and Astoria),
- Oregon Coast (includes the deep draft ports of Coos Bay and Newport)
- Columbia/Snake Up-River Region (includes all shallow draft ports located upriver of Vancouver on the Columbia, Snake and Clearwater rivers).

The key macroeconomic trends that drive trade on the North American West Coast are briefly reviewed in this section followed by baseline forecasts and an estimation of potential market opportunities.

Factors Impacting Waterborne Trade

World trade is driven by economic output, exchange rates, trade agreements and the increasingly inter-related world economy.

World Output

World output, as measured by the combined gross domestic product of all countries, grew at 3.3% per year between 1985 and 1994 and then ranged between 2.4% and 4.2% per year through 2004¹. In the longer-term, world output is expected to average 3.0% from 2010 to 2025². The advanced economies (U.S., Europe, Japan, and Canada, among others) currently account for nearly 70% of world output. These countries are expected to see output increase from the low levels experienced in 2001 and 2002 to about 3.0% annually from the present to 2025. The United States, which accounted for approximately 32% of world output in 2002, is expected to continue to outperform Europe and Japan.

Developing countries, including Asian countries (except Japan), have experienced the most rapid growth, at between 5% and 7% per year. These countries are expected to continue to grow within the historical range of growth. China's long-term economic growth is expected to be the highest among major economies. Global Insight's latest forecast for China projects a trend growth rate of 6% over the period from 2005 to 2025. What makes this growth rate even more

¹ Source: International Monetary Fund (IMF)

² Source: Global Insight

impressive is the fact that it is based on an average population growth rate of only 0.5% per year. This means that, by 2025, many of China's coastal provinces will be as affluent as today's Hong Kong and Singapore and the country's GDP will probably surpass that of Japan. Prospects for other Asian economies are for growth rates in the 4 to 5% range for the study period.

Most of the growth in world economic output is expected to be in the Trans-pacific region, which creates an opportunity for Pacific Northwest Ports.

Exchange Rates

Exchange rates also have a significant effect on trade flows. For example, there is a close negative correlation between wheat exports via the Columbia River and exchange rates. Between 1995 and 2001, the US dollar gained value against other exchange rates, resulting in a substantial decline in wheat exports.

Exchange rates can also impact potential opportunities to handle Canadian cargoes. As the US dollar increased in value against the Canadian dollar, it became more expensive to move Canadian cargoes via US ports. For example, when the potash facility in Portland was completed the value of the Canadian dollar was around \$0.75US. In the intervening years, the Canadian dollar declined to less than \$0.64US in 2002 (annual average).

The US dollar is expected to continue to weaken against other currencies. Global Insights predicts that over the longer term, Canada's strong economic and fiscal performance will move the Canadian dollar upward. Likewise, other currencies should also rise against the US dollar. In particular, the Chinese renminbi is expected to increase in the longer run, as China allows the rate to float but in the near term China will likely keep the renminbi pegged to the dollar.

A lower value of the U.S. dollar will increase export opportunities for Pacific Northwest ports.

World Trade

The relationship between growth in output and trade (via all modes, including air, overland and by water) has changed in recent years. In previous years, trade (in dollar value) averaged approximately 2.5 times the growth in output. As an example, if output increased at 3%, then trade increased at 7.5%. Trade was growing more rapidly than output as a result of globalization, reduction in tariffs and non-tariff barriers, and increased logistics productivity.

However, in the past five years, trade has grown much more rapidly than output because there has been a dramatic shift in production from North America and Europe to Asia (primarily to China). This has caused double-digit growth in trade, even though consumption was lagging. While subsequent growth in trade is expected to diminish, it will continue to be rapid.

Waterborne trade has not grown as rapidly as trade by air and overland (with Canada and Mexico). Between 1970 and 2000, world waterborne trade grew from 2.6 billion tons³ to 5.9 billion tons, or at 2.8% per year on average. The growth rate was higher for dry bulks (3.6%) and other dry cargo (4.4%, consisting of general cargo and automobiles, among other handling groups) and slightly lower for tanker traffic (1.3% annual growth).

³ All tons are reported in metric tons, which equal 2,204.6 pounds.

Summary

The opportunities for Pacific Northwest ports appear to be favorable for several reasons:

- First, world economic output is expected to remain strong and stable in the long-term,
- Second, most of the growth in output is occurring in countries bordering the Trans-Pacific,
- Third, exchange rates are expected to favor exports, which benefits the Columbia/Snake River and Oregon Coastal port regions,
- Fourth, trade is growing more rapidly than output.

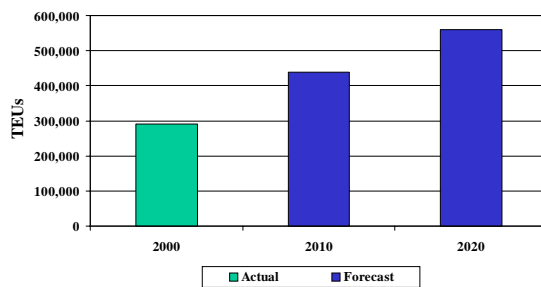
Cargo Forecasts

Columbia River Port Region

This section presents forecasts for the Lower Columbia River Region.

Containers

Figure 1 – Lower Columbia Ports Container Forecast



Container traffic via the Lower Columbia region has consisted primarily of exports from the Pacific Northwest (forest and agricultural products from Oregon, Washington and Idaho), although in recent years imports (consumer goods and inputs for manufacturers) have begun to increase. The deepening of the Columbia River and development of distribution centers, both of which are underway, improve the opportunity for future growth. In addition,

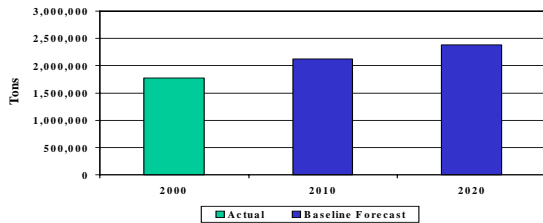
congestion in other west coast ports is driving carriers and shippers to seek new gateways.

The baseline forecast projects container throughput increasing from around 300,000 TEUs in 2000 to 550,000 TEUs in 2020. The expected growth rate of 3.4% is approximately half the rate of growth expected at other west coast ports.

Breakbulk

Breakbulk cargoes generally consist of forest and metal products that are hand-stowed or palletized. Most of the products in this category that can be containerized already have been. Exceptions include steel products (large sheets, coils etc.) that are not containerizable. Other products (such as newsprint from Longview) move in large enough volumes or on particular

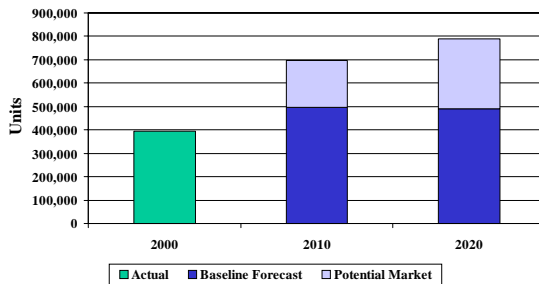
Figure 2 – Lower Columbia Ports Breakbulk Forecast



trade routes such that breakbulk is less costly than containerized shipments. Breakbulk cargoes are expected to increase from approximately 1.7 million tons in 2000 to 2.4 million tons in 2020, or at 1.5% per year.

Autos

Figure 3 – Lower Columbia Ports Auto Forecast



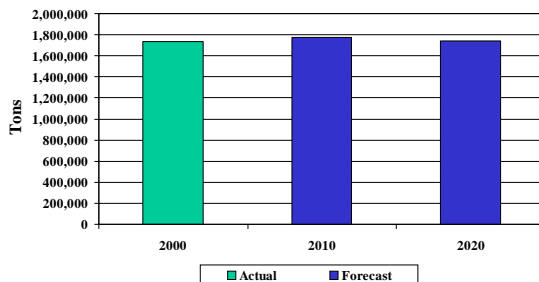
The Lower Columbia region has long been an efficient gateway for autos produced in Asia. Most of these imports (85% to 90%) move by rail to the inland U.S. The baseline forecasts expect continued stable growth at around the rate of population growth.

However, the baseline forecasts may be superseded by the addition of new manufacturers (from China), logistics

consolidations between manufacturers, and shifts between regions, particularly from California. Including the baseline forecasts and potential market opportunities, the Lower Columbia region could increase auto traffic from approximately 400,000 units in 2000 to nearly 800,000 units in 2020, which would result in average annual growth of 3.5%.

Logs

Figure 4 – Lower Columbia Ports Log Forecast

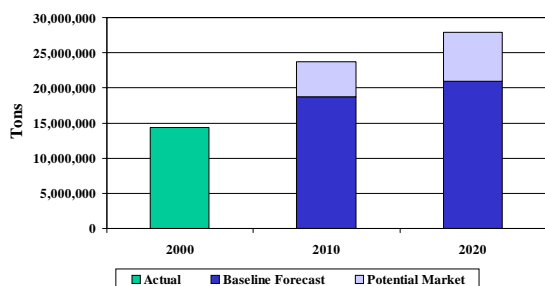


Log exports have declined over the recent past do to reduced timber harvests and increased domestic utilization of raw logs. However, log imports and domestic shipments of logs have increased in the recent past.

The forecast calls for log traffic to remain at its current level of 1.7 million tons. Imports and domestic traffic are expected to offset declines in exports.

Grain

Figure 5 – Lower Columbia Ports Grain Forecast



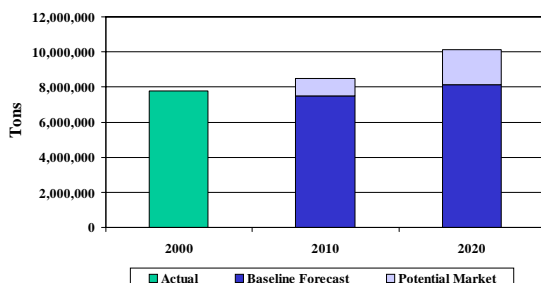
The Lower Columbia River ports handle approximately 40% of U.S. wheat and barley exports and around 10% of corn exports. In the past three years, grain exports have grown significantly due to the lower value of the dollar and attractive shipping rates to Asia from the PNW relative to the U.S. Gulf. In the longer term, the prospects appear favorable due to continued growth in Asian markets as consumption of meat increases with income. China, in

particular, is expected to increase grain purchases from the U.S.

Under baseline condition, grain exports are projected to grow from 15 million tons in 2000 to 21 million tons in 2020, or at 1.9% per year. However, there is an opportunity for another feed grain export facility in the Lower Columbia, which could bring grain exports up to 28 million tons in 2020.

Other Dry Bulks

Figure 6 – Lower Columbia Ports Other Dry Bulk Forecast



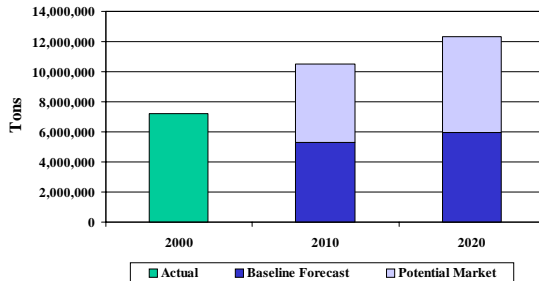
Other dry bulks moving through the Lower Columbia River region include exports of potash, soda ash, petroleum coke, ores/concentrates and bentonite clay and imports of cement, limestone and gypsum, among other products.

The baseline forecast calls for an increase in other dry bulks from 7.8 million tons in 2000 to 8.1 million in 2020. However, there are potential additional market

opportunities due to the combination of strong growth in Asia (particularly China), the lower value of the dollar and shifts from other regions due to congestion and redevelopment. For example, potash exports from Canada are increasing at the present time as it becomes relatively less expensive to operate in the PNW than in Vancouver BC. In addition, copper concentrates are now beginning to flow from a Montana mine to China after several years of closure due to strong demand and attractive export prices. Potential opportunities could generate an additional 2 million tons above the baseline forecast by 2020.

Liquid Bulks

Figure 7 – Lower Columbia Ports Liquid Bulk Forecast

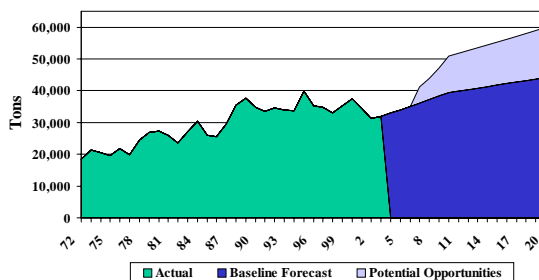


The Lower Columbia ports receive petroleum products and inputs for manufacturing (chemicals for production of a variety of products and crude oil for production of asphalt). In 2000, inbound liquid bulks were higher than normal due to the closure of the Olympic Pipeline⁴. Under the baseline forecast, liquid bulks are expected to grow at approximately the rate of population growth and reach 6 million tons in 2020.

New market opportunities focus on liquid natural gas (LNG) as a result of higher natural gas prices, lower LNG costs, rising gas import demand, and the desire of gas producers to monetize their gas reserves⁵. Two proposals in the Lower Columbia (at Port Westward and Warrenton) are currently under consideration. If one of these projects moves forward, liquid bulk imports could increase by an addition 5 to 6 million tons.

Summary

Figure 8 – Lower Columbia Ports Summary Forecast



Marine traffic passing the entrance of the Columbia River increased from 18 million tons in 1972 to 32 million tons in 2003, which amounts to annualized growth of 1.8%.

Under the baseline forecast, marine traffic is projected continue to grow at the historic rate of growth.

If all potential market opportunities come to fruition, marine cargo would grow at an average annual rate of 3.8% and reach 60 million tons by 2020.

⁴ Service by the Olympic Pipeline has been restored.

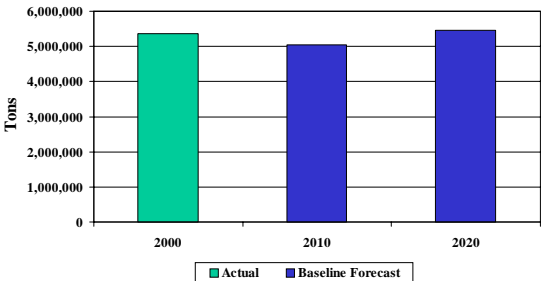
⁵ Source: Energy Information Administration

Columbia/Snake River System Inland Ports

This section presents forecasts for the shallow draft ports upriver of Vancouver on the Columbia, Snake and Clearwater Rivers.

Grain

Figure 9 – Columbia/Snake River Inland Ports Grain Forecast



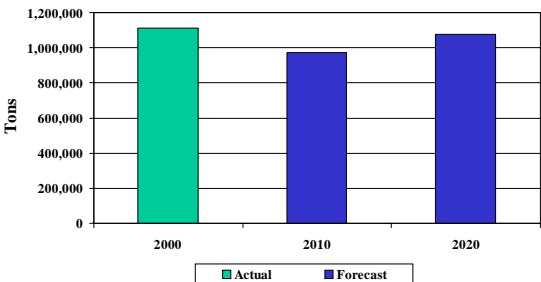
Wheat and barley are the primary products flowing on the Columbia/Snake River system. In 2000, 5.3 million tons of wheat and barley was barged down the river system. Approximately 62% of this grain originated on the Clearwater and Snake rivers and the remainder originated at barge terminals on the Columbia River. Grain traffic on the system reached a peak in 2000 and then fell substantially in 2001 and 2002 as a result of weak overseas

markets and competition from railroads before beginning to rebound in 2003.

The baseline forecast calls for grain to experience continue modest growth, reaching 5.5 million tons in 2020.

Forest Products

Figure 10 – Columbia/Snake River Inland Ports Forest Product Forecast

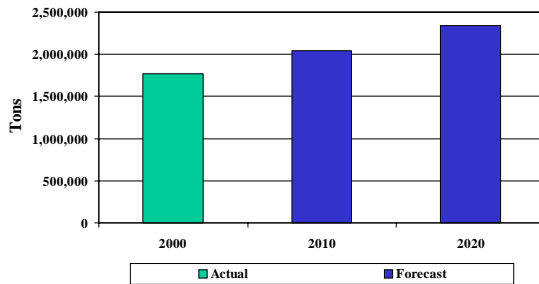


In 2000, 1.1 million tons of forest products transited the Columbia/Snake River system, including manufactured products (pulp, paper and lumber moving in breakbulk or containerized form) as well as resources for domestic mills and export markets (logs and wood chips). As with grain, these products declined as manufacturers changed their sourcing and logistics patterns.

The baseline forecast calls slow growth from 2010 to 2020, with a rebound to the levels experienced in 2000 by 2020.

Liquid Bulks

Figure 11 – Columbia/Snake River Inland Ports Liquid Bulk Forecast

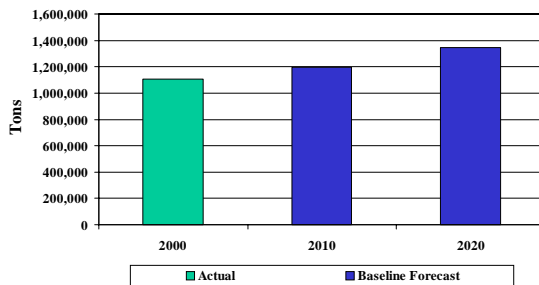


Petroleum products and liquid fertilizers are barged upriver to meet the needs of consumers and farmers. In 2000, there were approximately 1.8 million tons shipped upriver of Vancouver.

The baseline forecast calls for these shipments to reach 2.3 million tons in 2020, or at 1.4% per year.

Other

Figure 12 – Columbia/Snake River Inland Ports Other Product Forecast

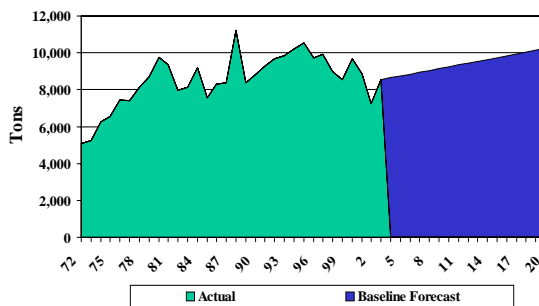


Other products include crude materials (stone, gravel), fertilizer (dry), and miscellaneous products (such as garbage in containers). In 2000, there were approximately 1.1 million tons of these products shipped on the river system.

The baseline forecast calls for these shipments to reach 1.3 million tons, or at 1.0% per year.

Summary

Figure 13 – Columbia/Snake River Inland Ports Summary Forecast



Traffic on the Columbia/Snake river barge system grew from 5.0 million tons in 1972 to 8.5 million tons in 2003, or at 1.8% per year. Traffic peaked in 1988 at 11.2 million tons and again in the mid-1990s at 10.5 million tons. However, volumes generally declined between 1995 and 2003 due to weak markets overseas, the strength of the U.S. dollar and competition from railroads.

The baseline forecast projects that traffic will continue to grow modestly, reaching

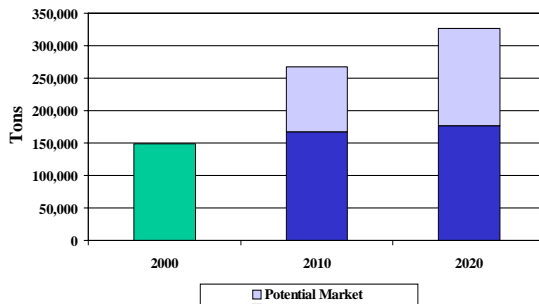
10.2 million tons by 2020, which amounts to growth of 1.1% per year.

Oregon Coast Deep Draft Ports

This section reports briefly on the forecasts for the ports on the Oregon Coast.

Breakbulk

Figure 14 – Oregon Coast Ports Breakbulk Forecast



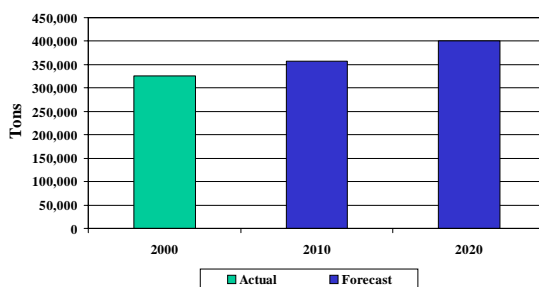
Breakbulk traffic via the Oregon Coast has primarily consisted of exports and domestic shipments forest products (lumber and other wood products). In 2000, approximately 150,000 tons of this product was shipped.

The baseline forecast calls for breakbulk shipments to reach 177,000 tons, or growth at 0.9% per year. However, a new mill is under construction in Coos Bay and another may be planned in the future. It is

expected that these projects may generate an additional 150,000 tons of waterborne breakbulk shipments in 2020.

Logs

Figure 15 – Oregon Coast Ports Log Forecast

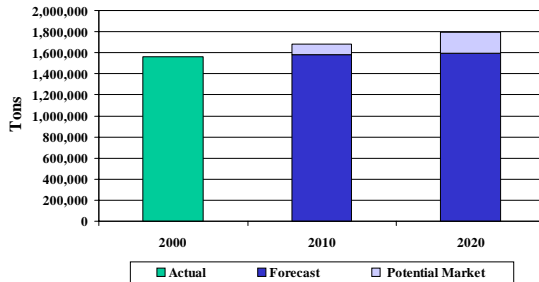


Log traffic on the Oregon Coast consists of log exports as well as log imports and domestic receipts. Log exports have declined during the past and are expected to continue to decline. Receipts of logs to feed area mills have and are expected to continue to increase modestly.

The baseline forecast calls for log traffic to increase from 325,000 tons in 2000 to 400,000 tons in 2020, or at an annual growth of 1.0%.

Dry Bulks

Figure 16 – Oregon Coast Ports Dry Bulk Forecast



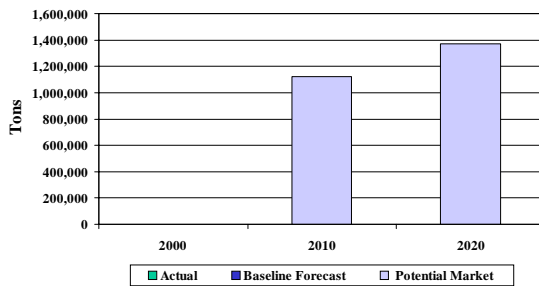
Dry bulks are primarily composed of wood chip exports. Over the past twenty years, wood chip exports have declined substantially due to the strength of the U.S dollar and competition from overseas providers.

The baseline forecast calls for a modest increase in wood chip exports, with growth from 1.5 million tons in 2000 to 1.6 million tons in 2020.

However, there is reason to believe that a shift in logistics patterns is occurring away from Northern California ports to Oregon Coast ports. This could lead to an opportunity to export an additional 200,000 tons by 2020.

Liquid Bulks

Figure 17 – Oregon Coast Ports Liquid Bulk Forecast

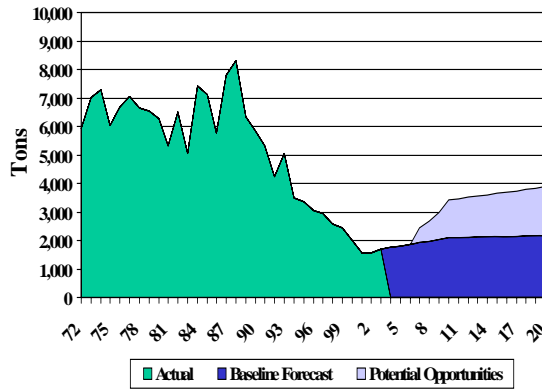


Oregon Coastal ports do not ship or receive liquid bulks by water at the present time.

However, there is also a proposed LNG terminal planned at Coos Bay, which would serve the local area and the area inland to the Willamette Valley. The current plans for this facility call for approximately 1.3 million tons of LNG.

Summary

Figure 18 – Oregon Coast Ports Summary Forecast



Oregon Coast ports have experienced a continuous decline in waterborne traffic from more than 8.0 million tons in the late 1980s to 1.7 million tons in 2003. This decline was caused by declining forest products manufacture and a shift from overseas markets accessed by water to inland markets accessed by truck and rail. However, the worst appears to be over. The baseline forecast expects modest growth in the existing product base, with growth to 2.1 million tons by 2020.

In addition, new opportunities such as the proposed LNG terminal could increase cargo volumes to 3.9 million tons by 2020.