



Bureau of Planning and Sustainability
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MEMO

DATE: January 19, 2016

TO: Portland City Council

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SUBJECT: Marine cargo forecast in Economic Opportunities Analysis

The marine cargo forecast was a key issue raised in the November 19th public hearing on Portland's draft Economic Opportunities Analysis (EOA). This memo presents updated analysis of a medium cargo forecast that could be incorporated into the EOA.

Overview of the cargo forecast issue

Public testimony to City Council on the EOA focused on the cargo forecast and was divided on the issue of whether to use a low or medium cargo forecast. Business, labor, and agricultural representatives raised concerns that the low forecast in the EOA sends a negative message that could discourage harbor reinvestment and impact agricultural and other export markets. Environmental and neighborhood representatives supported the current draft EOA that reflects the balance of industrial and environmental objectives in the draft plan.

Specifically, the Port of Portland documented several major investments to expand existing marine terminals. These investments substantially expand the Portland Harbor's existing capacity to meet forecast growth and have made the medium forecast scenario a more realistic option without development at WHI. This memo proposes an update to the cargo forecast to account for these capacity investments and a revised medium cargo forecast scenario. If City Council agrees with this updated approach, BPS will incorporate these revisions into the EOA for final adoption.



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Revised methodology to estimate marine terminal land needs

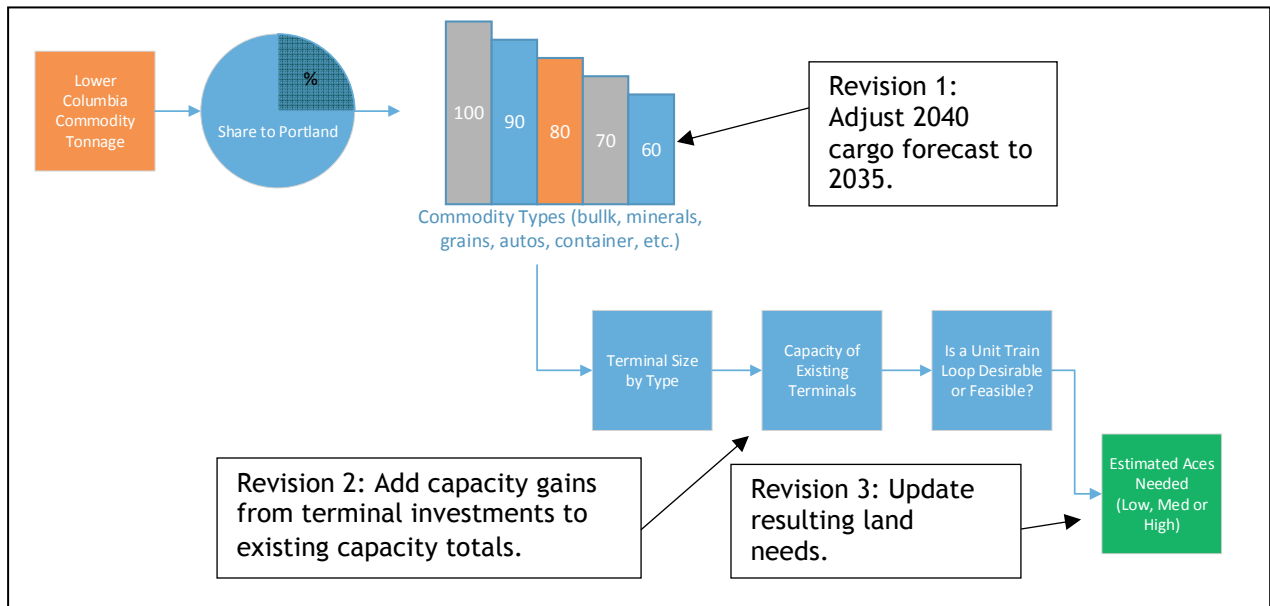
The EOA estimates most employment land needs using a jobs forecast. The EOA estimates air, rail, and marine terminal land needs separately, because these freight terminals are unusually land-intensive facilities, and their facilities expansion is more accurately estimated by their cargo throughput than job growth.

The overall methodology of the EOA cargo forecast for marine terminal land needs is summarized in the following steps and the diagram below.

Cargo forecast and land needs methodology

1. The land need forecast starts with a forecast for the tonnage of commodities that will move through the Lower Columbia River ports.
2. Portland's share is then estimated based on historical data and trends.
3. The Portland share is allocated to different commodity types, because different commodities will have different marine terminal land need characteristics.
4. The unutilized capacity of existing terminal facilities of different types and the need for additional terminal facilities are estimated. The estimate of the range of anticipated terminal sizes is based on case studies of terminal design characteristics found in modern terminals throughout the world.
5. Finally, the estimates of the acreage needed for these terminal facilities were prepared for the low, medium, and high land need scenarios based on policy and facility design considerations.

We recommend revisions to update the cargo forecast methodology in three areas, which are highlighted in the diagram.



- Revision 1: Adjust the 2040 cargo forecast by commodity type to 2035. This change will more accurately estimate capacity needs of each commodity type in 2035.
- Revision 2: Add the capacity gains from recent terminal investments (\$250 million after 2012) to the existing capacity totals by commodity type. This change substantially expands existing capacity estimates available to meet 2035 demand.
- Revision 3: Update the resulting land needs estimate, applying “practical” site size estimates and integrating land needs of the cargo forecast and jobs-by-building-type forecasts to more accurately avoid double-counting.

Revision 1: Adjust 2040 cargo forecast to 2035

The current EOA calculates unmet land needs for each cargo type to 2040 and then adjusts the total marine terminal land needs back to 2035. The analysis is based on a background study of harbor land needs (ECONW, 2012), which is Appendix A of EOA Section 1. The revised Medium scenario adjusts the 2040 cargo volumes to 2035 and then calculates land needs. This refinement provides a more accurate estimate of land demand for each commodity type. The 2035 cargo volumes are shown in the table below, including a final column showing the 2040 medium scenario forecast of the current EOA for comparison.

Table 1.

Portland Harbor Cargo Forecast in Metric Tons, Public and Private Terminals

Cargo Type	2010 Cargo Volume	2035 Cargo Volume (draft 2016 revision)			2040 Medium Cargo Volume
		Low	Medium	High	
Metric Tons					
Automobiles	376,000	929,000	1,035,250	1,141,500	1,206,000
Containers	1,129,000	1,933,000	2,314,250	2,695,500	2,583,500
Breakbulk	966,000	1,115,500	1,208,000	1,300,500	1,242,000
Grain	6,113,000	6,597,500	8,958,000	11,318,500	9,078,000
Dry Bulk	6,193,000	9,878,500	13,385,000	16,891,500	14,093,500
Liquid Bulk	5,948,000	6,955,000	7,463,250	7,971,500	7,461,500
TOTAL	20,724,000	27,408,500	34,363,750	41,319,000	35,664,500
Average annual growth rate		1.1%	2.0%	2.8%	1.8%

Source: BST Associates, *Portland and Vancouver Harbor Forecast Update*, February 2012.

BPS calculated 2035 volumes at midpoints of BST forecasts to 2030 and 2040.

Revision 2: Add capacity gains from recent terminal investments

The current EOA estimates the capacity of existing marine terminals in 2012, based on ECONW’s 2012 harbor land needs study (Appendix A of EOA Section 1). Since that time, major investments at some of Portland’s automobile, grain and dry bulk marine terminals has substantially expanded their capacity to handle future growth. The resulting capacity gains are estimated by the Port of Portland in their January 7, 2016, testimony to City Council on the draft Comprehensive Plan.

Table 2.

Capacity Gains from Recent Marine Terminal Investments in Metric Tons					
Terminal	Marine terminal investments since 2010			Total Existing Capacity	
	Investment (\$ millions)	Year	Capacity Gain	August 2015 EOA	Draft 2016 revision
Automobiles			118,800	889,000	1,007,800
Auto Warehousing - Ford	\$9.5	2014-16	118,800		
Containers				3,999,000	3,999,000
Breakbulk				2,350,000	2,350,000
Grain			2,650,000	7,100,000	9,750,000
Columbia Grain	\$44	2014	1,900,000		
Louis Dreyfus	\$21	2015	750,000		
Dry Bulk			3,250,000	12,200,000	15,450,000
Canpotex	\$165	2015	2,250,000		
Kinder Morgan	\$9.50	2013	1,000,000		
Liquid Bulk				8,280,000	8,280,000
TOTAL				34,568,000	40,836,800

Source: Investment estimates by ECONW. Capacity estimates by Port of Portland.

Updated capacity shortfalls analysis

The cargo forecast methodology estimates future land needs by subtracting available capacity of existing terminals from forecast future volumes. Compared to the current draft EOA, the adjusted capacity shortfalls under the medium forecast would eliminate the need for additional dry bulks capacity and substantially reduce the need for additional automobile and grain terminal capacity, as shown in the table below. In these calculations, the capacity utilization assumptions of the current EOA are not changed, which estimate 90% capacity utilization under the medium forecast and 66% under the high forecast before new terminal acreage is added.

Table 3.

2035 Portland Harbor Cargo Forecast Capacity Shortfall						
Cargo Type	2040 Forecast Capacity Shortfalls (August 2015 EOA)			Adjusted 2035 Forecast Capacity Shortfalls (Draft 2016 revision)		
	Low	Medium	High	Low	Medium	High
Metric Tons						
Automobiles	-187,000	-410,000	-730,000	-21,980	-128,230	-476,352
Containers	0	0	-1,120,000	0	0	-56,160
Breakbulk	0	0	0	0	0	0
Grain	0	-2,390,000	-4,370,000	0	-183,000	-4,883,500
Dry Bulk	0	-2,960,000	-10,949,000	0	0	-6,694,500
Liquid Bulk	0	0	0	0	0	0
TOTAL	-187,000	-5,760,000	-17,169,000	-21,980	-311,230	-12,110,512

Revision 3: Update resulting land needs

Based on the adjusted 2035 cargo forecast and the updated existing capacity, resulting cargo shortfalls create the future land needs. Marine terminal land needs in the EOA are expressed in terms of minimum, practical, and modern (rail loop access for unit trains) site sizes.

Generally, modern site sizes reflect a current competitive standard of the industry; practical site sizes reflect case studies examined; and minimum site sizes reflect examples of existing terminals built under historical market conditions. The current draft EOA uses a “practical” site size assumption. Using “practical” site sizes, the estimated land needs is 150 acres in the revised medium forecast.

Table 4.

Portland Harbor Medium Forecast Land Needs						
Cargo Type	2035 Medium	Existing	Capacity	Medium Forecast Land Needs (acres)		
	Forecast	Capacity	Shortfall	Minimum	Practical	Rail Loop
Automobiles	1,035,250	1,007,800	-128,230	50	100	100
Containers	2,314,250	3,999,000	-			
Breakbulk	1,208,000	2,350,000	-			
Grain	8,958,000	9,750,000	-183,000	30	50	100
Dry Bulk	13,385,000	15,450,000	-			
Liquid Bulk	7,463,250	8,280,000	-			
TOTAL	34,363,750	40,236,800		80	150	200

Available land supply of the Harbor Access Lands geography

Harbor Access Lands is one of ten employment geographies where growth capacity is analyzed in the EOA, consisting of industrial land along the deep-water shipping channel. The current Draft EOA identifies a 38-acre land supply shortfall in the Harbor Access Lands geography under the low marine terminal forecast scenario. An estimated 150-acre land need for marine terminals under the revised medium cargo forecast and practical site-size assumptions would result in a 23-acre shortfall of the Harbor Access Lands geography, as shown in the table below. This small shortfall could potentially be met at nearby locations off of the harbor -

In other words, 150 acres of marine terminal demand under the revised medium forecast could potentially be accommodated by surplus industrial capacity in the adjacent Harbor and Airport District, assuming the other industrial land strategies (i.e. brownfields, golf courses, freight investments) result in a surplus capacity in the adjacent Harbor & Airport Districts..

- Port of Portland Terminal 4: 30 acres, plus potentially 15-20 acres east of UP main line
- Port of Portland Terminal 6: 40 acres, plus potentially 35-45 acres south of Marine Drive
- Time Oil: 57 acres, plus potentially 27 acres at inactive or underutilized sites nearby.

Table 5.
Land Needs by Building Type for Harbor Access Lands

Building types	August 2015 EOA (Low Cargo Forecast, practical site sizes)				Draft 2016 Revision (Medium Cargo Forecast, practical site sizes)			
	Demand (2010-35)		Total Supply	Surplus/Deficit	Demand (2010-35)		Total Supply	Surplus/Deficit
	Jobs	Land			Jobs	Land		
Marine terminals	325	125	87	-38	850	150	127	-23
Other building types	1,745	82	82	0	1,220	42	42	0
General Industrial					173	10		
Warehouse					104	9		
Flex					0	0		
Office					733	16		
Retail					157	5		
Institutional					54	2		
Total	2,070	207	169	-38	2,070	192	169	-23