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Assessing Feasibility of an Inland Container Terminal in the Pacific Northwest (Summary)

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This is a summary of "Assessing Feasibility of an Inland Container Terminal in the Pacific Northwest" by Eric Jessup, PhD, and Mohammad Maksudur Rahman, at Washington State University. This paper received funding from USDA's Agricultural Marketing Service (AMS) through cooperative agreement number 17-TMTSD-WA-0003. The opinions and conclusions expressed are the authors' and do not necessarily reflect the views of USDA or AMS. The full report is available online at http://ses.wsu.edu/wp-content/uploads/2020/08/PNW-Inland-Container-Terminal-Modeling-Project-Final-Report.pdf.

WHAT IS THE ISSUE?

Although agricultural exporters require containers to sell their products overseas, efficiently managing the supply and demand of empty containers is difficult, particularly in the Pacific Northwest (PNW). For agricultural shippers, accessing the surplus of empty containers at port locations is often costly and inefficient—the process creates traffic congestion near ports and requires considerable energy and transportation resources.[1]

As the expansion of ports in PNW is constrained by limited space and rising real estate prices, storing containers near ports may become increasingly difficult. Additionally, rising demand for containerized exports—which largely depend on trucks—stands to exacerbate highway congestion, pavement impacts, energy consumption, and emissions. These costs are borne by farmers, exporters, and PNW residents in general, and therefore, multiple parties could benefit from better logistical management in the region.

One potential solution would have the Northwest Seaport Alliance develop an inland container terminal to reduce costs and remedy container-management issues. In this scenario, container freight would concentrate at the inland port and be loaded on rail for export moves, instead of traveling by truck to port terminals. Also, inbound container freight could be moved to the inland terminal quickly by rail instead of amassing at port to wait for a truck. But where should such an inland terminal be located?

[1] Currently, shippers have two main options to access surplus containers in PNW: (1) relocate empty containers near a production site, or (2) ship cargo to port by truck or rail and transload the cargo into an empty container.

The study from Washington State University examines the feasibility of developing inland container terminals by modeling potential locations for these facilities. Then, for each potential location, the study evaluates container demand at the inland terminal, inland freight transportation costs, and composition of container traffic via truck and rail.

WHAT DID THE STUDY FIND?

The researchers consider three potential locations for an inland container terminal in their model: Millersburg, OR; Richland, WA; and Spokane, WA. Next, they model scenarios moving agricultural commodities using low, medium, and high levels of rail rates, which represent rates 0 percent, 50 percent, and 100 percent above the railroad's marginal cost, respectively. The five agricultural commodities included—apples, cherries, potatoes, grains, and hay—represent considerable volumes of containerized exports in the PNW. The results compare and evaluate the three scenario outcomes against the baseline scenario.

Because Class I railroads contract freight months in advance and prefer adequate and consistent volumes, any inland container terminal must have a regular flow of freight. However, this regularity represents a potential challenge because agricultural shipments are seasonal by nature. The researchers find Millersburg exhibits the least month-to-month change in monthly container volumes of the three locations. Although Spokane and Richland show more seasonality than Millersburg, they also move significantly more containers. Considering the two most economically important potential locations have the most variable volumes, seasonality represents a potential challenge to the development of an inland container terminal.

A considerable portion of container traffic is diverted from truck to rail when the Richland or Spokane location is used. Specifically, the model reveals Richland would handle between 52 and 59 percent (depending on the rail rate) of all PNW agricultural containers; Spokane would handle 44-48 percent; and Millersburg only 13-15 percent. Consequently, the Richland and Spokane locations allow a reduction in I-90 traffic by roughly 50 percent of the current port-bound agricultural traffic.

In addition to traffic improvements, Spokane and Richland locations result in considerable cost savings at every rail rate level. The highest savings are associated with the Richland location, with a decrease in total transportation costs between 7 and 14 percent ($5.5 to $10.7 million) from the baseline. These savings vary by commodity, but the transportation cost for every commodity is universally lower at the Richland location, compared to the baseline.

The researchers also examine how the results respond to increased demand for containerized exports. Notably, exports of all five commodities have increased 91 percent since 2002 and could further increase in the future. An inland container terminal would help with future increases because the baseline scenario is only capable of handling a 35 percent increase in containerized exports. In contrast, each of the modeled inland-container-terminal scenarios can handle a demand increase of at least 50 percent.

HOW WAS THE STUDY CONDUCTED?

The researchers develop an optimization model, in which shippers minimize costs under various constraints, in order to study shipper decision making and the consequent logistical impacts. They gather data from several sources, including USDA, the Surface Transportation Board, and the Northwest Seaport Alliance, to solve the model.

For spatial analyses, the researchers collect a list of producers and distributors from State and regional commissions. Then, they distribute USDA production data equally among all distributor locations to estimate freight flows. The study includes the top five destinations for agricultural exports out of PNW: China, Hong Kong, South Korea, Japan, and Taiwan.

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