Commission Briefing Paper 4B-02

Implications If Future Changes in Primary Trading Partners Result in Shifts of Shipping Traffic From West Coast Ports to East Coast Ports

Prepared by: Section 1909 Commission Staff
Date: January 11, 2007

Introduction

This paper is part of a series of briefing papers to be prepared for the National Surface Transportation Policy and Revenue Study Commission authorized in Section 1909 of SAFETEA-LU. The papers are intended to synthesize the state-of-the-practice consensus on the issues that are relevant to the Commission's charge outlined in Section 1909, and will serve as background material in developing the analyses to be presented in the final report of the Commission.

This paper presents information on consequences of shifts in trading partners for the domestic transportation system.

Background and Key Findings

The growth in U.S. foreign trade with Japan, then with the "Four Tigers" (Korea, Taiwan, Malaysia, and Singapore), and now with China has placed substantial demands on West Coast ports and on highway and railroad links between the West Coast and the rest of the U.S. If India becomes the next source of growth in international trade, how much traffic is likely to shift from the West Coast to the East Coast and what are the implications for ports and other freight infrastructure?

- Imports from Asia through all coasts and borders are forecasted to increase from 114 million tons worth $351 billion in 2002 to 484 million tons worth $2.6 trillion in 2035. Asia's share of total imports is expected to increase from 10 percent of weight and 34 percent of value in 2002 to 20 percent of weight and 49 percent of value in 2035.
- Asian imports moving by truck, rail, or intermodal combinations from West Coast ports increase from 2.2 million equivalent container loads in 2002 to 13.2 million in 2035.
- If India replaces China as the Asian supplier of imports to the eastern United States, between 609,000 and 5.8 million equivalent container loads to shift from West Coast to East Coast ports in 2035. The most likely forecast is 1 million equivalent container loads, which averages to approximately 4,500 equivalent container loads each day.
- If 1 million container loads shifted among the coasts, the West Coast would still have to accommodate a 6-fold increase in Asian imports, from 2.2 million equivalent container loads in 2002 to about 12 million in 2035. The freight system would still have to accommodate domestic movements from West Coast metropolitan areas to states east of the Rocky Mountains, growing from 38 million equivalent container loads in 2002 to over 90 million in 2035.
- The diverted container loads could compound delays on the already congested highways and rail lines of the eastern United States. Additional forecasts of temporal and

geographic variation in the shifts of traffic are necessary to estimate specific consequences for congestion, and this paper is already pushing the limits of forecasting to obtain the aggregate statistics.

- Developments involving the Panama and Suez Canals will affect the share of international trade among West and East Coasts.
- The possible shift of Asian imports from West Coast to East Coast would place additional demands on eastern ports and congested freight facilities, but provides only modest relief to western ports. West Coast ports would still face enormous growth in Asian imports, even with the highest likely diversion to the East Coast.

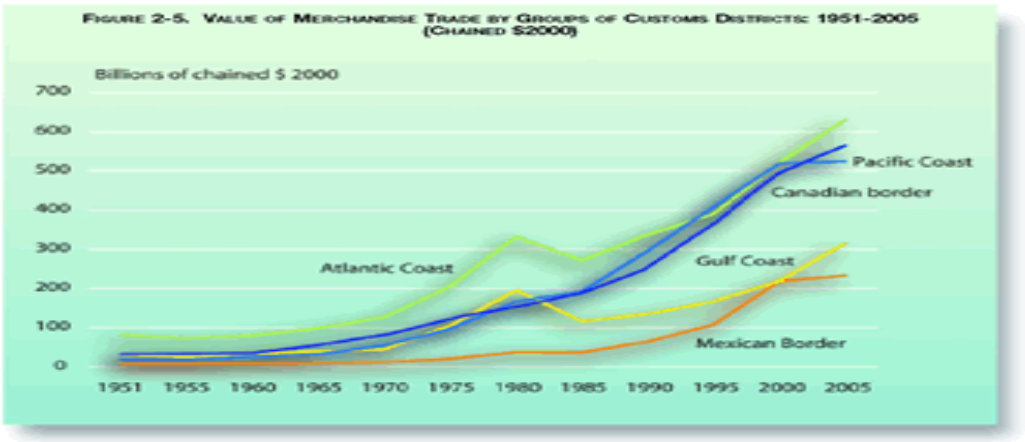
Staff Comments

This commission briefing paper is one of several that examine trends and consequences of commodity flows. Paper 01 reviews trends in international trade and trading partners. Paper 02 estimates shifts of trade through West Coast ports to east Coast ports if trading partners change. Paper 03 investigates the role of Canadian and Mexican ports in handling U.S. foreign trade. Paper 09 considers the role of short sea shipping in foreign and domestic trade. Paper 10 outlines forecasts of future commodity flows by geography and mode, and Paper 06 describes economic forecasts that underlie the commodity flow predictions. Forecasts presented in these papers are based on common methods, but in some cases use different years, commodity classification systems, and geography.

International Trade by Coast for the Past Half Century

The growth of international merchandise trade by coast and border is illustrated in the following figure.[1] When the Interstate System was launched 50 years ago, half of the value of international trade in goods entered or left the U.S. along the Atlantic Coast. The Pacific Coast accounted for only 10 percent, with the balance passing through the Canadian and Mexican borders and the Gulf Coast. Today, the Pacific and Atlantic Coasts each handle about one-fourth the value of international merchandise trade, which has increased in constant dollars 16-fold

Figure 1



[1] Federal Highway Administration, *Freight Facts and Figures, 2006*, Figure 2-5, http://www.ops.fhwa.dot.gov/freight/freight_analysis/nat_freight_stats/docs/06factsfigures/fig2_5.htm

Imports from Asia through 2035

Continued growth in international trade through the West Coast is likely given forecast growth in imports from Asia. While the quantity of total imports is forecast to double between 2002 and 2035, imports from Asia quadruple and increase their share from 10 percent to 20 percent of all imports. The share of imports entering the United States through West Coast ports is forecast to increase from 51 percent in 2002 to 70 percent in 2035.

The forecasts of tremendous growth of imports from Asia in tables 1 and 2 assume that capacity will expand to meet demand, At 25 tons per container, imports from Asia leaving West Coast ports by truck, rail, or intermodal combinations increase from 2.2 million equivalent container loads in 2002 to 13.2 million in 2035.[2] If ports operate 5 days per week and 50 weeks per year, these volumes represent almost 9,000 containers each day in 2002 to nearly 53,000 average daily movements in 2035.

Table 1. Tons from the Freight Analysis Framework

	2002	2035
Tons of imports from Asia	113.7 million	484.0 million
Tons of imports from Asia in or through Pacific States moving from port by truck, rail, and intermodal	55.3 million	335.4 million
Tons of imports from Asia through Pacific States to states east of the Rockies by truck, rail, and intermodal	3.0 million	15.2 million

Note: This table excludes air cargo

Table 2: Value from the Freight Analysis Framework

	2002	2035
Value of imports from Asia	$351.5 billion	$2.6 trillion
Value of imports from Asia in or through Pacific States moving from port by truck, rail, and intermodal	$244.5 billion	$2.1 trillion
Value of imports from Asia through Pacific States to states east of the Rockies by truck, rail, and intermodal	$29.7 billion	$240.1 billion

Note: This table excludes air cargo

These forecasts assume that most of the growth in trade from Asia will continue to focus on the Pacific Rim. Forecasts by the previous national transportation policy study commission over 25 years ago assumed that Japan would drive growth in trade.[3] Forecasters later shifted the assumed focus of growth to Korea, Taiwan, Malaysia, and Singapore--also known as the "Four Tigers"--and most recently to China. According to some analysts, India may become the next focus of growth in trade if its manufacturing sector opens to the world as has its service sector.

The India Factor and Consequences for the Coasts

The potential emergence of India as a major trading partner raises the possibility that growth in Asian trade will shift from the West Coast to the East Coast. While East Asia reaches traditional

[2] The Freight Analysis Framework forecasts weight and value of commodity flows by mode. Current forecasts appear to misclassify some commodities. As a consequence, the conversions of weight into equivalent container loads include some commodities such as automobiles that do not move by containers. These statistics are not the same as TEUs or FEUs.

[3] National Transportation Policy Study Commission, *National Transportation Policies through the Year 2000*, 1979.

markets in the eastern United States most effectively via West Coast ports and land bridge services, South Asia reaches the eastern United States more effectively via the Suez Canal and the Atlantic.

The hypothesized shift of Asian imports from West Coast to East Coast ports assumes that a substantial portion is destined for the eastern United States. Only 5 percent of the tons and 13 percent of the value of Asian imports through states on the Pacific Coast go directly to states east of the Rocky Mountains. However, these statistics do not include imports that terminate temporarily on the West Coast, either at distribution centers and warehouses for eventual reshipment, or at manufacturing and assembly plants for transformation and shipment to the rest of the country. For domestic shipments originating in the Seattle-Tacoma, Portland, San Francisco-Oakland-San Jose, Sacramento, Los Angeles, and San Diego metropolitan areas, slightly more than 4 percent of the tonnage is destined for states east of the Rocky Mountains.

Table 3 presents three scenarios for diversion of Asian equivalent container loads from West Coast to East Coast. The low scenario assumes that only Asian imports through West Coast states destined for states east of the Rocky Mountains are diverted. The middle scenario adds a modest estimate of redistributed or remanufactured Asian imports to the diverted goods. The estimate is calculated by multiplying the Asian imports through the West Coast to western states times the ratio of domestic shipments from West Coast metropolitan areas to eastern states to all domestic shipments of West Coast metropolitan areas. This assumes that the proportion of Asian imports through West Coast distribution centers, warehouses, manufacturing plants, and assembly plants ultimately destined for eastern states is similar to the domestic shipping patterns of all establishments in West Coast metropolitan areas. The high scenario adds a higher estimate of redistributed or remanufactured Asian imports to the diverted goods, recognizing that Asian-based goods may be shipped greater distances than domestic goods. The high scenario is calculated by increasing the ratio in the middle scenario by a factor of 10. In all cases, only imports and domestic traffic forecasted to move by truck, rail, or intermodal combination in 2035 are counted.

Table 3. Diversion of Asian Traffic from West Coast to East Coast

	2035
Low scenario: annual equivalent container loads of imports from Asia through Pacific States to states east of the Rocky Mountains by truck, rail, and intermodal	609,380
Middle scenario: annual equivalent container loads of imports from Asia through Pacific States to eastern states including modest estimate of redistributed or remanufactured by truck, rail, and intermodal	1,128,391
High scenario: annual equivalent container loads of imports from Asia through Pacific States to eastern states including high estimate of redistributed or remanufactured by truck, rail, and intermodal	5,799,494
Low scenario: daily equivalent container loads of imports from Asia through Pacific States to states east of the Rocky Mountains by truck, rail, and intermodal	2,438
Middle scenario: daily equivalent container loads of imports from Asia through Pacific States to eastern states including modest estimate of redistributed or remanufactured by truck, rail, and intermodal	4,514
High scenario: daily equivalent container loads of imports from Asia through Pacific States to eastern states including high estimate of redistributed or remanufactured by truck, rail, and intermodal	23,198
Note: Assumes 25 tons per container moving 250 days per year.	

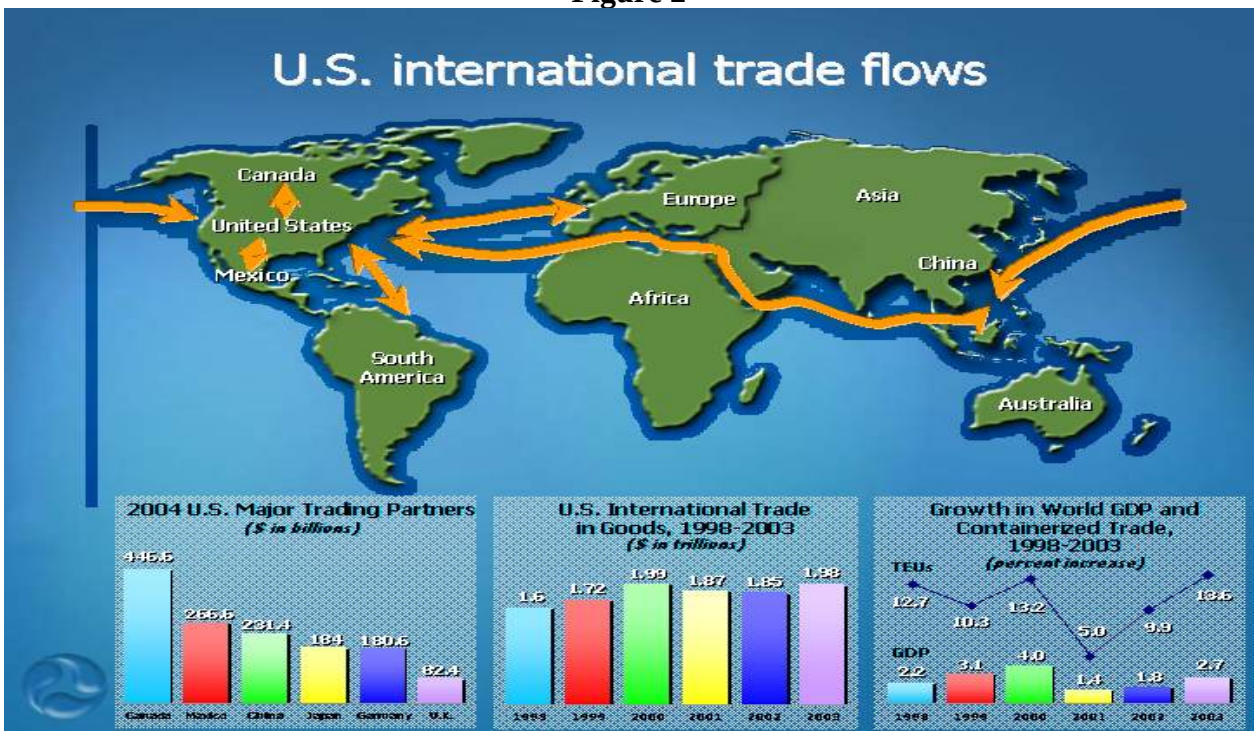
Even the lowest scenario in table 3 may be higher than actual diversion, since it assumes that India would capture all direct and indirect trade between Asia and the eastern United States in 2035. Furthermore, the equivalent container loads include commodities that typically do not move in containers. On the other hand, the daily container loads are annual averages and mask the significant seasonal peak in Asian imports preceding the holidays. The middle scenario, shifting about 1 million containers per year at about 4,500 per day, may be the most reasonable balance of these factors.

How significant is a shift of 1 million containers in 2035 from the West Coast to the East Coast? The West Coast would still have to accommodate a 6-fold increase in Asian imports, from 2.2 million equivalent container loads in 2002 to about 12 million in 2035. The freight system would still have to accommodate domestic movements from West Coast metropolitan areas to states east of the Rocky Mountains, growing from 38 million equivalent container loads in 2002 to over 90 million in 2035. While the diverted container loads may be small percentages of these numbers, they could compound delays on the already congested highways and rail lines of the eastern United States. Additional forecasts of temporal and geographic variation in the shifts of traffic are necessary to estimate specific consequences for congestion, and this paper is already pushing the limits of forecasting to obtain the aggregate statistics.

Other Trading Partners

Figure 2 illustrates the overall trading picture. While Asia represents growth in both absolute and relative share of U.S. merchandise trade, Europe and the Middle East will continue to provide significant traffic through the Atlantic and Gulf Coasts. Europe and the Middle East account for 17 percent of tons and 14 percent of value of U.S. imports in 2002, declining in relative share to 13 percent of tons and 10 percent of value in 2035.

Figure 2



The Question of Canals

The long-term shifts of international trade between U.S. coasts depends in part on two far away facilities: the Panama Canal and the Suez Canal.[4]

Since its opening, the largest users of the Panama Canal have been U.S. shippers. The time and distance savings of using the Panama Canal to reach the U.S. Atlantic or Pacific coasts from the other ocean have made this an historically important component of the U.S. transportation system, even though outside the country. Despite desires by shippers to take advantage of economies of scale available from using larger vessels, the lock dimensions of the Panama Canal have acted as a constraint on vessel size growth for all cross-isthmus trade routes and consequently as a constraint on economies-of-scale. With the growth in Asia – U.S. trade in the recent decades, the use of "all-water" routes between the U.S. Atlantic and Gulf coasts and Asia have become popular for shipments that did not need the premium speed advantage of being handled by West Coast ports and carried cross-country by intermodal rail or long-distance trucking. The Canal route has had a cost advantage over the 'mini landbridge' intermodal rail shipment due to the greater distance covered under the lower maritime ton-mile unit costs. With larger and larger container ship designs that are "Post-Panamax" (because they are too big for the Canal) introduced into transpacific and transatlantic U.S. trade routes, the underlying Panama Canal route cost advantage has been eroding.

By 2008 or 2009, it is likely that the Panama Canal will approach the limit of Canal transits which can be made by vessels using the Canal's existing twin sets of locks. The Panamanian's have anticipated this and have been planning construction of an additional set of locks for several years. Lasr October, the proposal by the Panama Canal Authority to expand the Canal was approved in a national referendum, with construction to be complete in 2014. Assuming that the approved plans proceed without delay, the opening of a larger additional set of locks in 2015, will likely lead to a shift in market share from Pacific Coast to Gulf and Atlantic Coast ports. For example, the Canal Authority says that the Canal's share of the Northeast Asia - US East Coast container traffic would fall from 38 percent in 2005 to 23 percent by 2025 if they didn't expand while the Canal's share will increase to 49 percent with the planned expansion, with consequential shifts in U.S. port and intermodal rail traffic patterns.

Such a dramatic shift in cargo routing depends on many important assumptions. Obviously, the magnitude of any market shift will depend on important factors, such as the eventual toll policy of the Canal, the rate responses (and performance) of the Class I railroads for their competitive international intermodal rail services, and the economics and size characteristics of the world container vessel fleet after Canal expansion.

The Suez Canal already has sufficient physical capacity for the U.S. maritime trade growth expected for routes that can efficiently use it, due to the longer distances between the U.S. and Asia using this route. The Suez Canal, as a sea-level canal, has depth limitations that constrain use of the Canal only for very large laden oil tankers, and the Suez Canal Authority has an ongoing dredging program intended to accommodate deeper draft ships. It is likely that additional container services made up of large vessels linking the U.S. to Asia and the Indian

[4] This section was authored by Global Insight.

Subcontinent will be introduced onto "Suez" routes before the Panama Canal can be expanded, meaning Atlantic and Gulf coast ports will be challenged to handle more 'Post-Panamax' ships before 2015.

The Suez Canal and the Panama Canal are also obvious "single-point-of-failure" bottleneck security risks for the world's maritime transportation system. Any lengthy disruption at either Canal would have significant follow-on impacts on U.S. maritime trade and the economy, as transportation costs increased due to a consequential scarcity in effective world vessel capacity.

Conclusion

The possible shift of Asian imports from West Coast to East Coast would place additional demands on eastern ports and congested freight facilities, but provides only modest relief to western ports. West Coast ports would still face enormous growth in Asian imports, even with the highest likely diversion to the East Coast.

CONSOLIDATED COMMENTS FROM MEMBERS OF THE BLUE RIBBON PANEL OF TRANSPORTATION EXPERTS - PAPER 4B-02

One reviewer commented as follows:

This paper illustrates that ports and the inland connections may be overwhelmed by imports from Asia regardless of whether low, moderate or high estimates of cargo growth are used.

The paper correctly notes that the expansion of both the Panama and Suez canals will have much to with shifts in bi-coastal trade gateways for Asian Cargo. It astutely explains that another major factor -- whether or not international freight will continue to be shortstopped (for initial value added or cross-dock handling) in southern California – will be major factor in the volume of cargo that can go elsewhere. (Note that Wal-Mart's shift of gateway and/or processing to Houston may be the sign of a new pattern.

Forecasts regarding freight flows to East and West Coast ports including impact of Panama and Suez Canals on flows seem reasonable. Two points:

1. There is a huge assumption that the US economy and consumers will be able to afford to pay for the doubling of their consumption over the next 20 years… otherwise the cargo will not come to either coast.
2. The potential backlash from communities facing port expansion is not discussed and ultimately may be the most important determinant of port growth on both coasts.

Another reviewer commented as follows:

> On Page 2, first bullet states: "The diverted [from the West Coast to the East Coast] container loads could compound delays on the already congested highways and rail lines of the eastern United States." This is too entrenched an outlook. Trade shifts that increase Eastern U.S. traffic would encourage additional investment, just as changing trade patterns of

the past have been accommodated by investment and operational decisions. The better question is, "What investments would be needed to handle the additional traffic, and is the investment for overall growth adequate?"

Page 4, the first full paragraph states: "Only 5 percent of the tons and 13 percent of the value of Asian imports through states on the Pacific Coast go directly to states east of the Rocky Mountains. However, these statistics do not include imports that terminate temporarily on the West Coast ... or at manufacturing and assembly plants for transformation and shipment to the rest of the country." This reviewer believes that this caveat is significant enough to essentially negate the figures cited. We know that much of the traffic that is counted as terminating west of the Rockies is subsequently hauled east.

On page 5, the second paragraph states: "How significant is a shift of 1 million containers in 2035 from the West Coast to the East Coast? ... [T]hey could compound delays on the already congested highways and rail lines of the eastern United States." Since the East is growing from 38 million TEUs to either 90 million or 91 million (with the 1 million diversion), the issue is whether investment for overall growth is adequate. This reviewer would suggest that the uncertainty about the extra million containers is irrelevant background noise in the calculation.