

# Commission Briefing Paper 4B-10

## Forecasts of Future Freight Flows By Commodity And Origin/Destination And Factors That Could Affect The Level, Distribution, And Mode Split Of Future Freight Flows

Prepared by: Global Insight, Inc.

Date: January 19, 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 forecasted transportation demand in the United States, by geography and mode, as well as discussions of factors that may have a major impact on these forecasts.

### Background and Key Findings

- Long term changes in transportation demand and expected modal choice and distribution patterns are not equal across the transportation market.
  - Growth in high value commodities predicts an increased market share for higher service modes such as air and truck, over lower service modes like rail and water.
  - While demographic growth in the Sunbelt region is predicted with increased freight flows to and from southern and southwestern states, it is not expected to cause major changes in total mode split.
  - An increase in imports will result in an increased market share for coastal states.
  - Changes in import patterns from an enlarged Panama Canal, Mexican port improvements, and emerging markets will increase dependency on Gulf and Atlantic Ports, and change inland distribution patterns.
- Modal split has - and can be - significantly impacted by technological, economic, environmental, and regulatory change, as well as relative investment in capacity.
  - The level of investment in transportation infrastructure can have a significant impact on distribution patterns.
  - Relative investment in capacity for different modes will impact modal choice.

### 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

**This paper represents draft briefing material; any views expressed are those of the authors and do not represent the position of either the Section 1909 Commission or the U.S. Department of Transportation.**

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.

## Transportation Demand

Global Insight’s forecast for United States Freight Transportation (Domestic and United States portion of imports and exports) is for an increase from 15 billion tons in 2004 to 29 billion tons in 2035, or 90% growth. The increase in tonmiles is slightly greater, from 6.1 trillion tonmiles in 2004 to 11.7 trillion tonmiles in 2035, or 92% growth.<sup>1</sup> Thus, average length of haul is increasing slightly.

As a baseline forecast, we assume the modal split remains constant for the same commodities and the same O-D pairs. As shown in Figure 1 and Figure 2, air and truck grow faster in tons and tonmiles while rail and water grow at a slower place comparatively. The sources that contribute to modal share change were investigated and are explained below.

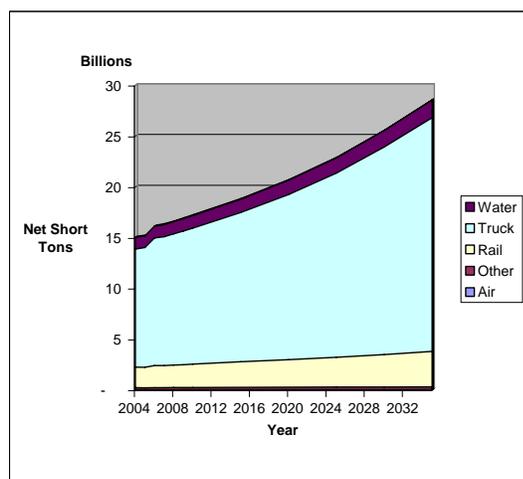


Figure 1 - Freight Tons by Mode

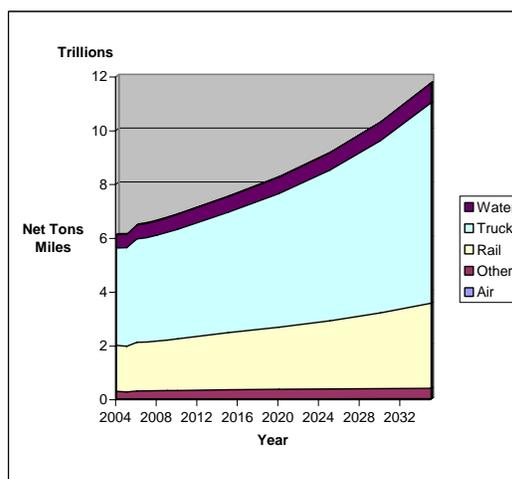
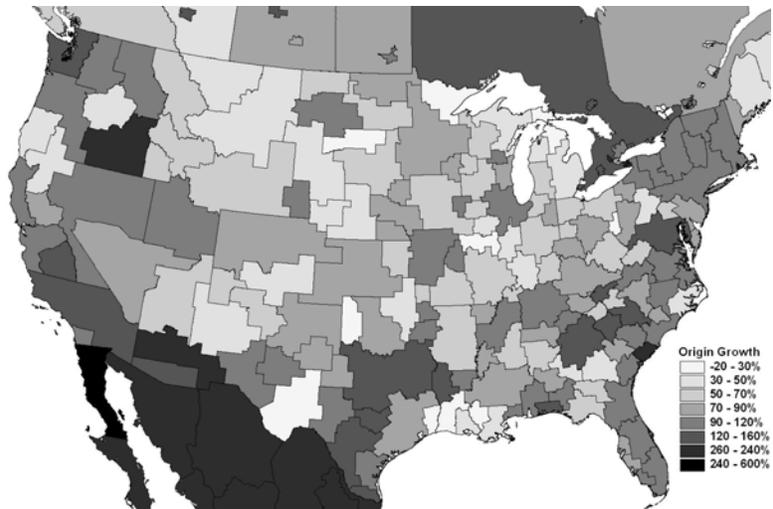


Figure 2 - Freight Tonmiles by Mode

## Shifts in Origin/Destination Demand

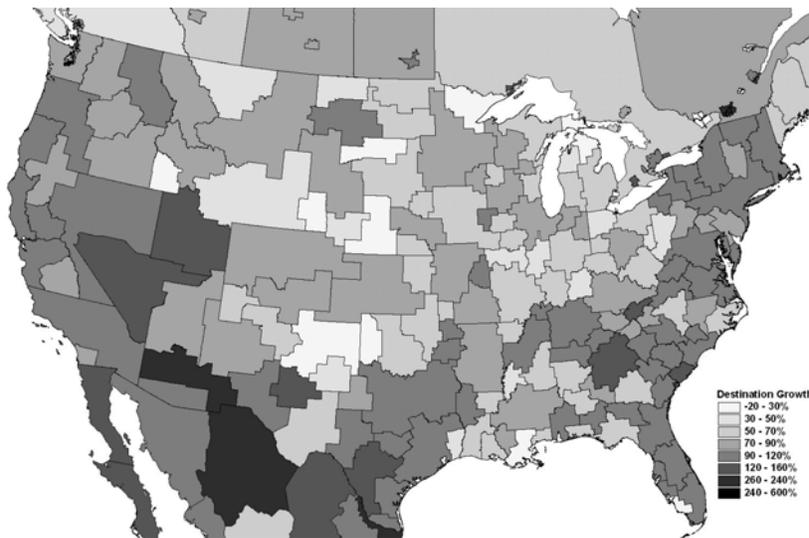
According to current Global Insight economic forecasts shifts in traffic originations will occur from 2004 to 2035, with the most significant growth in the Sunbelt region and along the coasts. This shift (shown as the rate of change in originated traffic tons) is clearly evident in Figure 3, which also reflects the slower growth of Midwestern transportation markets. The redistribution – largely a function of demographics, industry growth, and commodity mix – is addressed in more detail in Commission Briefing Paper 4B-04,06.

<sup>1</sup> Forecast of Global Insight's TRANSEARCH database. This database includes most movements of raw materials and finished goods to, from, and within the United States. However, there are certain exclusions, including small packages, household goods, some bulk commodities, and municipal wastes, as well as products transiting the United States. There is also some double counting of tons (but not tonmiles) of goods that use multiple modes or are reshipped.



**Figure 3. Originated Freight Growth, 2004-2035**

Figure 4 reflects a similar pattern of growth for traffic destinations (shown as the rate of change in terminated traffic tons), with growth most apparent in the Sunbelt region and along the two coasts, however, this time the predominance shown along the coast for originations is less apparent. This is not unexpected as exports are not as large a part of destination demand, nor are they as large as imports as measured in tons, or value.



**Figure 4. Terminated Freight Growth, 2004-2035**

Collectively, the charts provide interesting insights into shifting origin/destination patterns. (1) The growth of NAFTA imports is much more significant than the growth of NAFTA exports, and can be readily seen in the high growth regions of central Mexico. (2) The slower growth of originated and terminated freight in the Midwest, along with the relatively static forecasted (spell out) LOH, suggests that this region will see an effective increase in "pass-through" traffic, either to intermediate markets or through inter-coastal transfers (3) With public agencies already concerned about through traffic's unfavorable cost-benefit calculus, expectations are that policymakers will be pressed to permit expanded cost recovery schemes to offset states' increased share of infrastructure investment.

Global Insight forecasts are based both on predicted changes of supply and demand on a county and commodity basis. Reflected in the forecast is an average annual growth. By definition, changes in either demand at origins or at destinations will cause changes in distribution patterns. However, discounting for those changes, past experience shows as logistics costs have decreased, due to technology improvements or less ardent regulatory practices, distribution patterns have gradually changed. This phenomenon is implicit in the increase of imports and exports, as well as changes in domestic markets. However, forecasting these changes in distribution patterns requires modeling of not only future logistics costs but also of their deterrents to distribution.

### **Shifts in Import and Export Demand**

Global Insight forecasts that domestic flows of imports and exports will be impacted not only by the same factors as domestic flows, but also by changes in the overseas economies, and trade patterns. Imports through West Coast Ports are predicted to grow by 183% between 2004 and 2035, while remaining ports are projected to grow at 48%. This reflects both the continued domination of Asian trade, and the ability of West Coast logistics to handle this extraordinary volume of freight. The long projected shift of Asian cargo to Suez routings, and hence the shift of Far-Eastern trade to East Coast Ports is progressing more slowly than originally anticipated, and is likely to drive only limited coastal cargo shifts through 2035.

However, the distribution of foreign trade between West and East Coast (and Gulf) Ports is subject to a number of external factors that are still difficult to quantify. The decision to expand the Panama Canal is projected to divert significant flows from Pacific US Coastal ports to Atlantic and Gulf ports and will prove to have the most impact on foreign trade distribution. Other potential changes will be increased use of Mexican Pacific Ocean ports and they different types of expansion and thus competitiveness of ports on all coasts. As these shifts occur, the length of the inland haul will change, and thus potentially affect modal distribution.

The United States is currently a net exporter of bulk products on a tonnage basis (113 tons of exports for each 100 tons of imports). By 2035 this situation is expected to reverse with net import tonnage exceeding net export tonnage (96 tons of exports for each 100 tons of imports).

### **Transportation Demand by Commodity**

Table 1 uses 2004 data to show major commodity sectors (2 digit Standard Transportation Commodity Codes) sorted by growth rate, with their respective total tons and tonmiles. Also shown in the table is the average length of haul as well as the truck share of total volume for these individual commodity groups.

STCC	Name	2004 Mill Tons	2035 Mill Tons	Ton Growth	Average Miles	Tonmile Growth	Truck Share
50	Secondary Traffic	1,932.70	6,878.30	355.89%	239.18	281.84%	100.00%
14	Nonmetallic Minerals	3,468.30	5,176.70	149.26%	136.95	141.61%	90.66%
32	Clay, Concrete, Glass or Stone	1,330.50	2,537.90	190.76%	228.94	170.90%	93.98%
29	Petroleum Or Coal Products	1,273.60	2,218.20	174.16%	399.81	147.42%	67.74%
20	Food Or Kindred Products	998.2	1,917.90	192.13%	622.42	173.22%	87.63%
11	Coal	1,128.10	1,815.00	160.90%	732.62	146.97%	11.72%
28	Chemicals Or Allied Products	894.4	1,233.80	137.94%	613.94	115.62%	70.96%
1	Farm Products	996.2	1,176.60	118.11%	395.07	124.32%	71.62%
24	Lumber Or Wood Products	759.5	921.2	121.28%	394.28	115.94%	90.14%
33	Primary Metal Products	404.9	633.1	156.36%	553.35	146.99%	79.58%
36	Electrical Equipment	84.9	583.8	687.94%	769.7	455.14%	96.27%
40	Waste Or Scrap Materials	183.1	505.8	276.21%	522.73	221.76%	4.36%
37	Transportation Equipment	218.4	478.9	219.30%	694.16	186.21%	77.38%
26	Pulp, Paper or Allied Products	295.9	434.4	146.82%	635.2	140.09%	79.48%
46	Misc Mixed Shipments	115.4	416.5	360.85%	1,835.46	284.50%	
34	Fabricated Metal Products	180.6	361.6	200.24%	637.75	182.51%	96.95%
35	Machinery	106.8	346.2	324.31%	696.54	258.35%	90.43%
13	Crude Petrol. Or Natural Gas	181.6	228.6	125.88%	875.66	146.01%	0.77%
All Other		471	892.3	189.45%	885.33	178.44%	75.12%

**Table 1 - Freight Flow by Commodity**

In order to determine statistical congruence between commodity group, length of haul, and mode preference, a series of statistical analyses were performed. Results show a low correlation between commodity growth and length of haul, suggesting that the modest increase in average length of haul (identified above) is not due to an increase in long haul commodities, as might be expected. Rather, there is a marked correlation between high growth commodities and truck market share; faster growing commodities are those with a high truck market share.

### **Mode Split**

As discussed above, Global Insight forecasts presume constant modal splits for similar freight flows. However, numerous economic, regulatory, environmental, and technology changes can impact the forecast. Some of the major factors and projected mode share impacts are outlined below for highway, rail and intermodal modes of transport.

### **Factors and Impacts: The Future of Highway Transport**

Recent operating conditions for truckers have been challenging. Rising diesel fuel and insurance prices and other economic factors have forced many carriers, both large and small, out of the market. Conversely, the increase in overall economic activity has resulted in serious shortages of capacity to move freight throughout the country. Additionally, highway congestion in certain areas has complicated and slowed service to an extent that additional pressure is exerted on capacity.

Although there is significant diversity in the motor carrier industry in terms of operating characteristics, equipment types and geographic focus, the critical issues confronting all providers are largely identical and may be summarized as follows:

*Driver Shortage* - The U.S. motor carrier industry continues to experience a national shortage of truck drivers that has become a limiting factor in the operations of many companies. A Global Insight analysis found that the supply of new long-haul heavy-duty truck drivers is projected to grow at an average annual rate of 1.6% over the next ten years, against a demand of 2.2% average annual growth. At least another 219,000 new truck drivers must be found to replace drivers currently of ages 55 and older who will retire during the period, and to replace those in younger groups who will leave the occupation. This shortage is likely to be reflected in wage rates growing 6-7% per year (current driver wages are in the range of \$.35-.40 per mile), well ahead of the increase in wages economy-wide.<sup>2</sup>

*Fuel Costs* - Higher and more volatile fuel prices have caused significant disruption in recent years, and although the average price of crude oil is currently around 61 dollars with prices expected to moderate over the short term. Growing world-wide demand for oil, combined with flattening production volumes and environmental regulations (highlighted by ultra-low sulfur diesel fuel), will keep fuel costs increasing over the long-term. With an efficient road tractor burning diesel at approximately six miles per gallon, current fuel prices equate to nearly \$.50 a mile, making fuel the highest single cost component of truck operations. Fuel surcharges, while perceived as making up the differential, do not recover the higher costs of non-revenue activities such as the empty mileage between loads, trailer pool repositioning, and the out-of-route distances traveled to maintenance facilities and to bring drivers home. Moreover, the acceptance of surcharges by shippers has begun to fray under the pressure of escalating bottom line costs. The result is a heightened sensitivity among truck lines and their customers to mileage-based costs like fuel.

*Road congestion* - The miles traveled by all vehicles in the nation's highway system have almost doubled in the past twenty years, yet roadway lane miles have grown at a much lower rate.. The natural consequence is steadily mounting congestion. Truck lines treat congestion as an inevitable cost of doing business – but the cost can be high: a regional LTL carrier operating in the gridlocked Northeast estimates that congestion burdens the company up to \$3 million per year, or one percent of its revenues.<sup>3</sup> In an industry where average operating margins are considerably less than ten percent, this represents a material reduction in capital returns. An academic study in New York pegged the value per hour of a delayed truck at \$60-70, which is consistent with figures reported by carriers to Global Insight.<sup>4</sup> The Federal Highway Administration cites higher figures,<sup>5</sup> presumably by recognizing opportunity costs and the consequential expenses of service recovery and penalties. Carriers on average value transit time savings at \$142-192 per hour according to this source, and value avoidance of non-scheduled (unpredictable) delay at twice the rate of routine, predictable congestion. As non-scheduled delays are expected to increase in the future and move outward from urban centers, motor

---

<sup>2</sup> Section prepared by Global Insight for ATA in *US Truck Driver Shortage: Analysis and Forecasts*.

<sup>3</sup> New England Motor Freight, AASHTO Conference, St. George UT, May 2004.

<sup>4</sup> Rensselaer Polytechnic Institute. Figures reported to GII in carrier interviews were comparable.

<sup>5</sup> Freight Analysis Framework, Status & Future Directions, October 2002.

carriers are concerned that weakening operating performance and asset utilization will initiate another round of trucking business failures.

*Other Factors* – Diminished availability and the rising cost of insurance for motor carriage have been cited as contributors to truck line bankruptcies in the last several years, although the industry has always had a base level of turnover. A factor that was projected to be financially harmful but played out differently was the introduction of new U.S. DOT hours-of-service regulations in 2004. The regulations both lengthened and limited the amount of time truck drivers could be behind the wheel. Initial estimates of an expected drop in net productivity were proven incorrect, as the motor carrier industry took advantage of the rules change to justify rate increases and to negotiate operational improvements with customers who had often been indifferent to driver time. Coupled with tight capacity and its positive effect on rates, many trucking sectors subsequently improved financial performance.

### **Factors and Impacts: The Future of Rail Transport**

The North American rail network is divided into two basic categories; Class 1 railroads (annual revenues in excess of \$319.3 million in 2005), and all others (Class 2 and 3: regional, shortline, switching industrial and private railroads). Class 1 railroads represent nearly 93% of industry revenues and 68% of operated miles<sup>6</sup>. The major issues facing the industry are distinct to these two operating classes. Whereas Class 1 carriers are facing main-line capacity constraints, threats of economic re-regulation, and long-term revenue adequacy, Class 2 and 3 railroads are largely concerned about infrastructure capitalization and heavy-axle loadings.

The US rail network is over 90% privately funded and maintained and enjoys high economic barriers to entry. For the past 25 years, the industry has been focused (since the passage of economic deregulation in the Staggers Rail Act of 1980) on capacity management and profit maximization. More recently, however, the industry has been struggling to accommodate sustained double-digit growth in intermodal freight shipments and more modest growth in other carload commodities including coal, chemicals and transportation equipment which make-up the largest portion of revenues. For Class 1 railroads, however, there are some significant opportunities, including: (1) Continued expansion of international trade, (2) rising motor carrier operating costs, (3) increased potential for coal and ethanol use, and (4) injection of public capital to relieve rail infrastructure bottlenecks.

Many of these topics are addressed in more detail in other Commission Briefing Papers, but some of the challenges to the industry include: (1) the continuing problem of revenue adequacy, (2) limited network capacity, and (3) the limitations of private capital – without incentives from the public sector – to resolve these issues for the benefit of the nation. Certain aspects of these challenges merit further attention, as discussed below.

*Network Capacity* – Railroads' focus on selected high-density corridors represents the natural evolution of a strategy that seeks to employ the scarce resources of the company for the most profitable traffic available. Although a significant amount of excess capacity exists in rail networks generally, the relative complexities of concurrently operating highly scheduled intermodal service and high-volume unit trains hauling low value bulk commodities make it

---

<sup>6</sup> [www.aar.org](http://www.aar.org)

difficult to simultaneously exploit unused train, terminal and route capacity. Railroads are not only experiencing capacity limitations on their primary bulk and intermodal corridors, but also from limited terminal capacity in major metropolitan areas, at major interchange points (such as Chicago, St. Louis, and New Orleans, and from limited clearances in urban areas (such as the I95 corridor in the northeast, or in difficult terrain.

*Shortline Capitalization* – Historically, shortline railroads were considered economically stable if they averaged in excess of 100 carloads per mile of maintained track. This industry "rule of thumb" followed from historical revenue divisions, track maintenance and operating cost averages. Recent increases in insurance and labor rates and material costs suggest that even the "Rule of 100" is insufficient for sustained operations<sup>7</sup>. For 2005, however, only 49 average carloads per mile were reported for all shortlines and regional railroads<sup>8</sup>. Without sufficient market power to raise rates significantly, shortlines are being squeezed by shippers threatening to shift to truck or to Class 1 connections through a transload service. The problem is further compounded by the emergence of 286,000-pound (and potentially 315,000 lb.) freight cars on lightly constructed branchline track and bridges. The inability of these lines to generate sufficient revenue for continued investment is likely to place a considerable burden on public agencies, choosing between the loss of all rail service, or the risks of higher capital investments and the uncertainty of continued operations.

*Other Factors* – For the Class 1 railroads, there is additional risk in economic and environmental regulation. The chief concern is the continued decline of the traditional industries that have relied most heavily on the railroads for hauling their goods. To the extent that these products are supplanted by imports, there is an opportunity for railroads to handle them but in different composition and geography.

Despite these risk factors there is obvious growth potential, and, albeit with caution, modal market share gain for the Class 1 railroads. Among the smaller railroads, however, the outlook is less optimistic. Significant undercapitalization is apparent throughout this sector of the industry, and the looming expansion of heavy-axle load equipment exacerbates the infrastructure crisis. For bulk commodity shippers on regional, shortline or industrial lines, the risks are significantly greater. In all likelihood, the number of rail miles will continue to decline, with the greatest impact felt among smaller and light-density lines. The preponderance of these lines traverse rural regions, and the loss of rail shipping could accelerate the migration of jobs and intellectual capital among smaller and mid-sized communities.

### **Factors and Impacts: The Future of Intermodal Transport**

Historically, railroads anticipated intermodal growth tracking national GDP growth plus 1%. In recent years, however, growth has far exceeded these expectations. According to a study by TTX, containerizable imports as a share of total U.S. consumption had grown to nearly 46%. International container trade is expected to continue its robust growth over the next decade, which will result in substantial pressure on the land-side supply chain.

---

<sup>7</sup> [www.rblanchard.com](http://www.rblanchard.com)

<sup>8</sup> [www.aslrra.org](http://www.aslrra.org)

With rail capacity tight and intermodal service in high demand, railroads are using these forces to increase profitability and improve mix. They are increasingly focused on core commercial relationships, and only adding traffic that they believe will improve their profit performance over the long term. However, there are a number of barriers to intermodal growth that could constrain economic expansion. These (in addition to those applicable to the rail industry as a whole) include: a lack of service performance; a lack of railcar, rail trailer or container equipment; and a lack of coordination of the multiple physical and informational handoffs inherent in intermodal operations.

*Service Performance* – Railroads recognize two key issues in service performance: consistency and door-to-door transit times. The understanding is that current service is generally only competitive for the less service-sensitive traffic such as volumes between distribution centers. Railroads acknowledge that current performance cannot effectively compete for high-service traffic such as LTL, UPS, USPS and FedEx. Therefore, without the volumes to run customized train networks, railroads are walking away from market segments that cannot be handled incrementally on the existing network.

*Equipment*– Equipment issues continue to frustrate rail operations. Domestic intermodal has fully shifted to 53 ft. containers and boxes, while international traffic remains firmly locked into 20 and 40 ft. ISO containers. Railcars are being converted from 48 ft. platforms to 40 ft., and lessors are acquiring 53 ft. platforms for North American traffic. Railroads are not reinvesting in intermodal trailers, and the aging fleet continues to shrink. Preferring the margins on container traffic, several North American railroads have abandoned the ownership of domestic trailers altogether. From an operational perspective, the attraction of shifting domestic traffic to container is high. However, with some large intermodal customers preferring trailers the railroads are reluctant to eliminate trailer on flat car service. Railroads are committing to the domestic container, but may not fully realize the limiting impact of that decision on year-over-year growth prospects.

*Coordination* – One of the complexities of intermodal service is the number of hand-offs that occur between the origin and destination. Handoffs between rail carriers and other rail carriers, rail carriers and terminal operators, terminal operators and draymen, and draymen to customers require a significant amount of coordination. While rail mergers have reduced the volume of rail-to-rail handoffs, many still exist.

Although trade growth is expected to produce continued double-digit increase in demand for intermodal transport, these risk factors suggest that rail intermodal growth will be constrained. The limiting factors to growth, however, are largely economic. Targeted public participation in infrastructure investments for (1) line capacity expansion, (2) intermodal equipment, and (3) information systems could remove many of the obstacles to unrestrained growth. These investments are likely to be less costly than those for equivalently-sized highway facilities, and would generate fewer collateral impacts on the affected regions.

### **Impact of Institutional Changes on Distribution Patterns and Modal Split**

As shown above, both rail and highway modes face significant impediments to meeting anticipated demand without significant new investment. The forecasts of transportation flows

anticipate that the investment will be forthcoming to meet the anticipated demand. However, if adequate investment is not forthcoming for either mode, it can safely be assumed that distribution patterns will change. As demand rises without meeting supply, the equilibrium logistics costs rise. It will then be preferable to meet demand locally and to substitute products for those locally available.

Of course, as transportation costs rise, there will be additional incentives for transportation investments by the public or private sector. If investments are made primarily in one mode, than it follows that the mode with growing capacity will be more attractive and increase its share of freight flows.

Even with sufficient investment, changes in operating costs are also likely to cause some modal diversion. Global Insight predicts truck operating costs to rise by 92% between 2004 and 2035, while rail operating costs are projected to rise by 80% for the same time period. These costs are markedly driven by volatile energy costs, on which air and truck tend to be more dependent.

## **Conclusions**

Forecasts of freight transportation demand show changes in origins and destinations of freight flows that would lead to changed distribution patterns. Higher value commodities are expected to grow faster, leading to larger growth in air and highway freight volumes.

Without new investment, all modes are expected to experience capacity limitations from lack of infrastructure, labor, and equipment. If left unresolved, this will cause dramatic changes in distribution patterns. Given continued constrained investment, modal choice will be largely driven by relative investment levels, with public monies representing the largest contribution to infrastructure expansion. In all likelihood, policymakers will ultimately pick the winners and losers of mode shift, with those modes receiving more public investment being able to attract additional market share from those modes receiving less capital investment.

## **CONSOLIDATED COMMENTS FROM MEMBERS OF THE BLUE RIBBON PANEL OF TRANSPORTATION EXPERTS - PAPER 4B-10**

One reviewer commented as follows:

General -- Comments on page 1 about increased market share for trucking seem to be at odds with the discussion of current and future problems with this mode – driver shortages, higher fuel prices, road congestion, high insurance costs, etc. on pages 5-7.

The statement on page 1 about “Changes in import patterns from a enlarged Panama Canal, Mexican port improvements, and emerging markets will increase dependency on Gulf and Atlantic Ports, and change inland distribution pattern,” seems to be inconsistent with statement on page 4, “imports through West Coast Ports are predicted to grow by 183% between 2004 and 2035, while remaining ports are projected to grown by 48%... The long projected shift of Asian cargo to Suez routing and hence the shift to Far-Eastern trade to East Coast ports is progressing more slowly than originally anticipated, and is likely to drive only limited coast cargo shifts through 2035.

**This paper represents draft briefing material; any views expressed are those of the authors and do not represent the position of either the Section 1909 Commission or the U.S. Department of Transportation.** 10

Port industry executives make the point “if you’ve seen one port, you’ve seen one port.” The regional geographic and demographic context is very much determinative of the modal splits used and required in different parts of the county to meet future needs. Future federal policy needs to take international gateways and their multi-modal requirements into better account – and otherwise support greater modal diversity.

The paper provides a good balanced treatment of future factors impacting trucking and railroad sectors. There are several significant statements on pages 9 and 10, which need to be emphasized. “Targeted public participation in (railroad) infrastructure investments for (1) line capacity expansion, (2) intermodal equipment, and (3) information systems could remove many of the obstacles to unrestrained growth. These investments are likely to be less costly than those for equivalently-sized highway facilities and would generate fewer collateral impact on the affected regions.” “Given continual constrained investment, mode choice will be largely driven by relative investment levels, with public monies representing the largest contribution to infrastructure expansion. In all likelihood, policy makers will ultimately pick the winners and losers of mode shift, with those modes receiving more public investment able to attract additional market share from those modes receiving less capital investment.”

Another reviewer commented as follows:

Projected growth of domestic rail shipments, like coal, and international container trade will put great pressure on the capacity of railroads to handle the land-side supply chain. Railroads, however, are continually addressing the capacity problem with significant capacity expansion plans being developed. As long as volume is forecasted to grow and the railroads receive proper value for their transportation services, they will invest capital at the appropriate level. Federal funding in the form of tax credits for investment in track and other infrastructure to expand capacity is a strategy to enhance an efficient rail network.

Another reviewer commented as follows:

The reference on page 7 to the Staggers Act should say “the partial economic deregulation,” since a large portion of rail traffic remains subject to economic regulation.