

Commission Briefing Paper 2E-01

Conditions and Performance of Other Components of the Surface Transportation System

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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 discusses current condition and performance issues with "other" components of the surface transportation system (i.e., beyond highways, rail, and transit). In particular, it discusses port and intermodal connectors; inland waterway and coastal freight distribution; intermodal ferry terminal development; inland waterway lock and dam improvements; and border crossings.

Background and Key Findings

This paper provides examples of projects addressing surface transportation system constraints through alternative transportation projects. A dynamic combination of economic growth, electronic information technology and load centering at key freight centers combined with urban congestion has had crippling effects on the nation's freight surface transportation system. Building necessary intermodal freight capacity in a congested metropolitan area to address these issues is capital-intensive and extremely time consuming.

With population and consumption of goods increasing in the U.S., the most recent cargo growth projections for container ports anticipate a doubling or tripling of throughput growth in the next 15 to 20 years. Our nation's ports are rapidly running out of land and will require an alternative to the status quo in marine terminal infrastructure development and operations. This is also true of domestic cargo growth which in combination with international cargo and passenger traffic, impacts intermodal connectors, transportation corridors and in turn, the entire surface transportation system.

There are numerous emerging alternatives transportation concepts and initiatives that are rationally based means of improving the nation's surface transportation system.

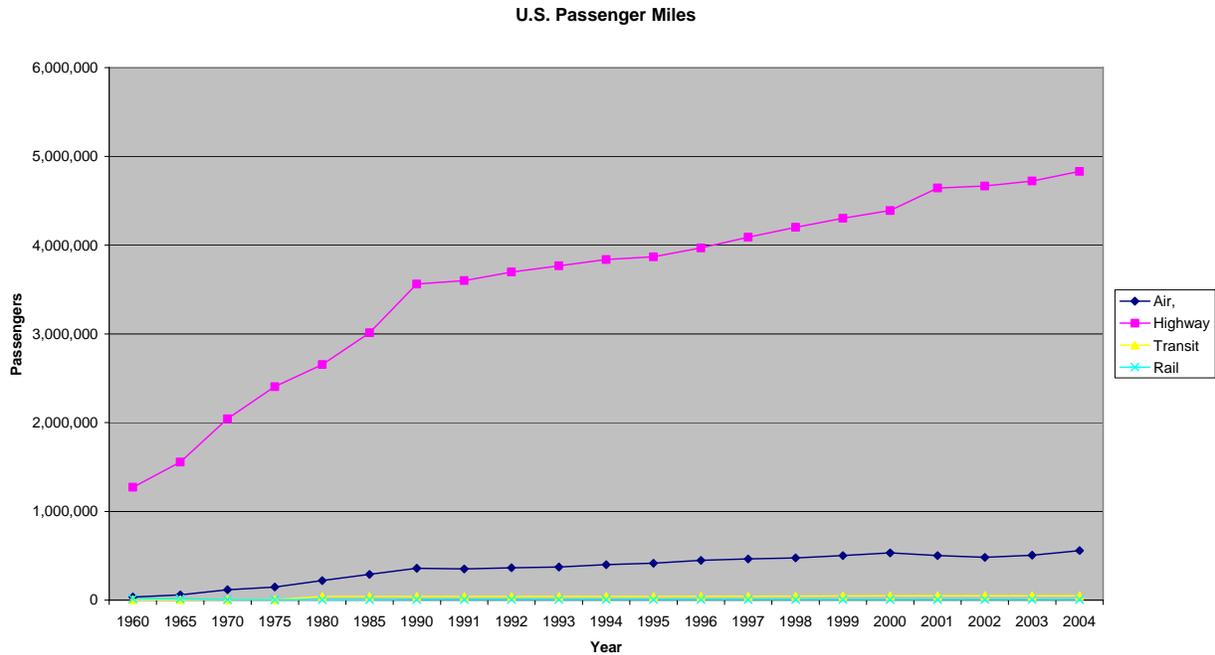
- Reliance on traditional thinking, lack of funding and continued use of conventional transportation modes has not provided potential solutions to existing and growing transportation challenges.
- Existing facilities are inadequate due to inefficient system linkages, inadequate capacity, travel and transportation demand, modal interrelationships, social and economic factors, operational and safety conflicts, and congestion.

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.

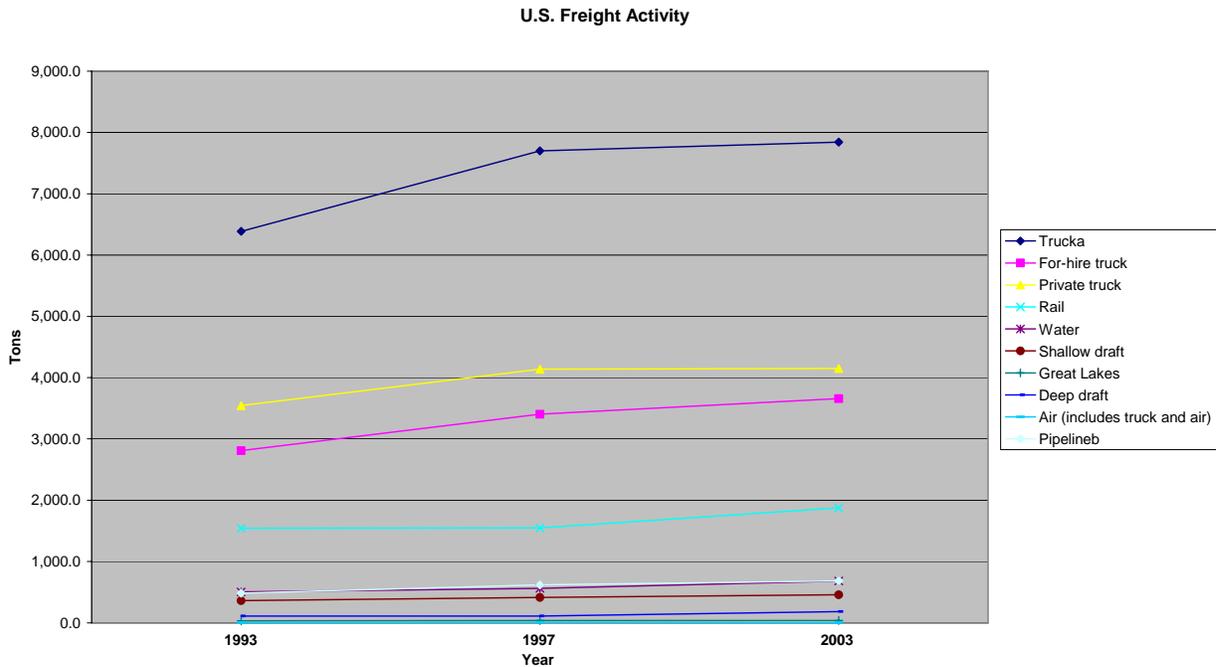
- As new concepts emerge that provide advanced means of transporting freight and people, special attention should be given to tracking and documenting their successes and challenges.

Current Issues and Selected Examples

A dynamic combination of economic growth, electronic information technology and load centering at key freight centers combined with urban congestion has had crippling effects on the nation’s freight surface transportation system, for both freight and passenger volumes.



Source: U.S. BTS, 2005



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Building necessary intermodal freight capacity in a congested metropolitan area to address these issues is capital-intensive and extremely time consuming. With population and consumption of goods increasing in the U.S., the most recent cargo growth projections for container ports anticipate a doubling or tripling of throughput growth in the next 15 to 20 years. Our nation's ports are rapidly running out of land and will require an alternative to the status quo in marine terminal infrastructure development and operations. This is also true of domestic cargo growth which in combination with international cargo and passenger traffic, impacts intermodal connectors, transportation corridors and in turn, the entire surface transportation system. New concepts and operational changes that reduce effectively congestion are clearly needed.

The following selected examples of emerging alternative components of the surface transportation system are identified as projects that have addressed freight surface transportation system congestion and capacity shortfalls from a non-traditional perspective. Their characteristics and performance are summarized here.

Port and Intermodal Connectors

Port and intermodal connectors also include waterside issues such as channel depth and air draft. These characteristics often limit a port's ability to accommodate larger vessels and create accessibility issues for international cargo where only a few ports exist to accommodate such vessels.

The Port of Oakland Harbor Navigation Improvement (-50 Foot) Project is an example of an alternative component improvement that not only improved the port's overall capacity but is essential to remaining internationally competitive.

There are only two primary cargo gateways in California; Los Angeles/Long Beach and San Francisco/Oakland; and only three on the West Coast, including Seattle/Tacoma. California's ports handle over 40% of the Nation's waterborne international trade. Without improvements to Oakland's infrastructure, cargo could flow to Mexican and Canadian ports, resulting in lost jobs and revenue from California and the U.S. This would have a severe impact on trucking as well as increased traffic hazards as the cargo is diverted to other, less efficient, modes of transportation.

Once completed the Port of Oakland Harbor Navigation Improvement (-50 Foot) Project will provide necessary intermodal freight capacity in the congested metropolitan areas of Oakland and the Los Angeles/Long Beach from a port perspective.

The demise of the old Grace and Pearman Bridges that spanned the Cooper River in Charleston, South Carolina, for years limited the Port of Charleston's ability to accommodate larger cargo vessels. The combined efforts of the recently completed Charleston's Harbor Deepening Project, that brought the existing inner harbor channels to -45 feet and entrance channel to -47 feet, and the new Ravelle Bridge increasing the air draft by 36 feet over Charleston's main shipping channel, has allowed the port to accommodate the largest vessels currently calling at East Coast ports. The combination of these two projects has improved capacity for both shipping and vehicular traffic

Inland Waterway and Coastal Freight Distribution Modes

Considering the cost to expand and repair the existing interstate highway and rail systems, the inland waterway transportation mode has long been recognized as the most economical and environmentally beneficial solution to solve the nation's congestion problem. Coastal trade has existed in the nation for many years. The majority of cargos carried have been bulk commodities that travel through an established inland waterway system and along the U.S. coasts by barge, tanker and freighter. The existence of these bulk carriers already contributes to a reduction of rail and highway congestion. Without these coastal freight distribution modes cargo would require transport by rail or truck.

The current interest in Short Sea Shipping in the U.S. is driven largely by congestion mitigation. Container on barge services the current intermodal coastal trade to a limited extent. Larger Roll-on/Roll-off and container ship services exist between the U.S. west coast and Alaska and Hawaii. The Port Authority of New York and New Jersey announced in 1999 the establishment of the "Port Inland Distribution Network" or PIDN to alleviate congestion at its port facilities. However, after a multi-year experiment, the initial PIDN barge service to Albany was discontinued after its operating subsidy ran out. Still, the PIDN is an example of a coastal freight distribution mode operating in the contiguous U.S. that contributed to the reduction of rail and highway congestion. A few container on barge services still operate between ports in the Gulf and another is currently operating between Norfolk and Baltimore in the Chesapeake Bay.

As Short Sea Shipping continues to develop and further research is completed, new high-speed vessel designs, trade routes and port terminals will need to be established throughout these coastal regions to avoid a similar fate as the PIDN.

Intermodal Ferry Terminal Development

Intermodal ferry terminal development has long been discussed but hampered by several realities. Existing facilities are inadequate due to inefficient system linkages, inadequate capacity, travel and transportation demand, modal interrelationships, social and economic factors, operational and safety conflicts, and congestion.

The Port Imperial Ferry in Weehawken, New Jersey is a impressive combination of marine engineering and architecture created to address the intermodal ferry terminal dilemma.. Serving New York Waterway ferry passengers, the 33,000 square foot facility on the Hudson River will accommodate as many as 20,000 commuters each day. This intermodal terminal will serve as the New Jersey gateway from the New York Ferry Terminal at West 38th Street, with a connection to the Hudson-Bergen County Light Rail system 300 feet southeast. A major commuter facility, it is anticipated that the terminal will significantly reduce tunnel and bridge traffic. Following a long tradition as an important trans-Hudson transportation node, the site concept coordinated the arrival/departure for Park 'n Ride, light rail, planned bus connections and pedestrians.

Another such project, the San Francisco Downtown Ferry Terminal, is intended to provide improvements to the downtown ferry terminal to handle the expected tripling of ferry ridership within fifteen years. The terminal is being planned to accommodate this growth with four new ferry floats to bring more riders to downtown San Francisco and a waterfront transportation center to house ferry ticketing, Amtrak interchange for passengers, bus drop-off, airport and hotel shuttles, and covered bicycle parking. Passenger amenities such as covered waiting areas, signage, and security improvements will also be provided as well as emergency facilities to allow ferries to operate in times of contingency.

Inland Waterway Lock and Dam Improvements

Our inland river system has provided over two centuries of cheap, reliable freight transportation, but is now suffering a serious decline in funding and maintenance of its critical locks and channels. Traffic on the nation's inland waterway system faces serious constraints due to the continued aging of navigation works. Inland waterways lock and dam structures have become antiquated and efforts to replace them with modern design and capacity enhancements has been stagnant. Congestion associated with the approaches to obsolete lockage structure means that tows of barges are queued for long distances along rivers banks for hours or days, waiting for access to the locks. During this waiting period barges are not providing any transportation service. Labor, capital and other operating costs, however, continue almost undiminished.

The problem arises from both the inadequate dimensions of older lock structures and from the physical deterioration. Older locks were designed to accommodate 600 foot barge tows ("trains" of individual barges), while modern barge tows are 1200 feet long. Delays are caused when these longer tows transit the shorter locks, necessitating the time-consuming exercise of breaking a tow and reassembly after passing through the lock in two or more segments. In addition, northern reaches of the Mississippi River can be ice-blocked and not navigable during winter. In the case of shipments to the Gulf Coast (to stage product for loading onto ships), shippers may also experience delays at their unloading destination at certain times of the year. All of these factors may contribute to supply disruptions.

Present travel above St. Louis can be difficult to accurately schedule because of lock delays. Increased movements on the inland waterways may eventually require, or at least would be better facilitated by upgrading certain locks. However, because of environmental considerations, groups may oppose such expansion. Funding for maintenance and infrastructure improvements for the inland waterways system and associated locks comes from the Inland Waterway Trust (50 percent) and the Federal Government (50 percent). Certain maintenance projects are budgeted while funding for improvements would require enabling legislation. Although the Corps currently has plans to upgrade locks causing delays, they have no formal timeline and these projects have not been fully funded.

Rising volumes of barge traffic and growing queues creates congestion and impairs the entire systems productivity. The Corps of Engineers has the responsibility to maintain the navigability of our inland waterways. One way the Corps of Engineers carries out this mission is to operate dams that control the flow of water on a river. However, the same dam that regulates river flows for navigation may also provide flood protection, provide water supply, generate power, and create recreational opportunities. These are more indicators of the nation's inland waterway system importance to trade, a healthy economy and recreational opportunities.

Lock and Dam 3 on the Upper Mississippi River enables agricultural goods from the upper Midwest to reach market, and building and other bulk goods to be shipped in. The constructed embankments no longer meet engineering standards, creating a level of instability which subjects the system to potential failure. An out draft current has led to many accidents, endangering the dam structure as well. Any drawdown of the dam's water pool from a breach or failure would seriously impact the Prairie Island nuclear power plant. However, no funds have yet been allocated to this project, which provides the potential for much needed increased capacity on the nation's inland waterway system.

NAFTA Customs Border Crossings

Fueled by NAFTA, trade between the U.S. and Mexico continues to grow strongly. Texas ports of entry handled approximately 75 percent of this surface trade, more than 85 percent of which moved by truck over distinct NAFTA corridors. Border bridges at Texas ports recorded over 6.7 million truck movements in 2000; more than half of these had U.S. origins or destinations outside Texas.

Federal and State inspection agencies have implemented many new processes to improve the speed and effectiveness of their individual agency missions. Nonetheless, the tracking, routing and managing of trucks through the border station remains largely a manual process. Although delays vary significantly from port to port, virtually all experience peak demands when the system is overwhelmed, creating congestion and freight bottlenecks.

In response to this emerging concern, the Texas Department of Transportation (TxDOT) commissioned researchers at two Texas institutions, the Center for Transportation Research (CTR) of the University of Texas at Austin and the Texas Transportation Institute (TTI) of the Texas A & M University System, to examine the feasibility of an expedited border process, which would facilitate trade while permitting the federal and state agencies to maintain their inspection responsibilities.

The project team determined that the automation of the crossing process is feasible and will not add substantial additional costs (less than five percent, based on current estimates) above the existing infrastructure cost of border facilities. The opportunity to process conventional traffic more efficiently and to offer expedited processing to those companies able to use such a system would provide much needed capacity to the NAFTA Border Crossings network.

Conclusions

This paper has provided just a few examples of projects that are addressing surface transportation system constraints through alternative transportation projects. The reality is there is a multitude of emerging alternative transportation concepts and initiatives that are rationally based means of improving the nation's current intermodal system. Today, reliance on traditional thinking, lack of funding and continued use of conventional transportation modes has not provided potential solutions to existing and growing transportation challenges.

As new concepts emerge that provide advanced means of transporting freight and people, special attention should be given to tracking and documenting their successes and challenges. Much of the transportation private industry is uncomfortable taking risks and entering new markets without proof of concept or contingency plans. More financial support for transportation planning and investment in alternative components of the surface transportation system is needed to preserve the nation's competitive position in the global economy.

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