

Testimony

Delivered to the

House Committee on Transportation and Infrastructure

**Intermodalism:
The Transportation Imperative
for the 21st Century**

Professor Patrick Sherry

University of Denver
Intermodal Transportation Institute
National Center for Intermodal Transportation

June 15, 2006

Intermodalism: The Transportation Imperative for the 21st Century

Professor Patrick Sherry, Ph.D.
Professor, Intermodal Transportation Institute
Co-Director, National Center for Intermodal Transportation
University of Denver
&
Mississippi State University

June 15, 2006

Congestion, competition, capacity, and conservation are the major challenges facing the US transportation system that can be met with the adoption of a serious commitment to intermodalism. Increased congestion on our highways, railways, and ports, coupled with increasing fuel costs, security threats, and competition in the global marketplace from developing countries, as well as an impending shortage of workers in the transportation industry and the ever tightening financial resources, will test our ingenuity and creativity. However, I believe that the best hope for the future of transportation in this country will come from the adoption of a truly intermodal transportation system that ensures the safe, secure, seamless, sustainable, and cost effective transport of people and goods.

What is intermodal transportation? Many people think first of the freight industry with containers on flatcars and the water to land transfer of materials. The definition that we use at the University of Denver and Mississippi State University is “the seamless interconnection of two or more modes of transportation to create an efficient, safe, secure, sustainable, and ethical system of transportation.” This definition has guided our thinking and research at the Intermodal Transportation Institute (ITI) at the University of Denver and at the National Center for Intermodal Transportation (NCIT) for the last eight years. As I recently explained to a student of mine, we are talking about connectivity. For example, the only way to get to Denver International Airport (DIA) is via a car or a taxi. DIA could have been truly intermodal as a rail line runs right through the middle of the terminal and connects all of the concourses. However, rail access from the city to the airport is the lacking essential piece. The rail right-of-way runs along side the airport but there is no intersection and no passenger service. A truly intermodal system would have provided a *seamless connection between two or more modes with resulting capital and operating efficiencies*.

Perhaps some analogies will make this clearer. Think about how a letter gets to Denver. It moves unobstructed through several different modes of transportation. Sending this letter involves the use of planes, trains, and trucks. All that is required is a stamp and an address for this letter to negotiate the transportation system. For passengers, however, the situation is more complex. Getting to this hearing this morning involved a car., a plane, a taxi, an Amtrak train, and a subway train—all requiring separate tickets, except for my car.. None of these modes are truly integrated, and with the exception of the

Metro line that took me fairly close to Reagan National Airport, none of the modes are fully interconnected.

Nature provides other examples of intermodal connections. The process of transferring oxygen to the various cells in the human body is very complex. Oxygen must enter the lungs through the airway, crossing through the lungs and into the blood stream and then into the cells of the various organs. That is a perfect description of intermodal interconnectivity, transferring essential products in a timely fashion. Another great example is the internet and the transfer of data in the form of digital data packets through a huge network of interconnected computers. These nodes in the internet are the ideal analogy to our vision of a truly intermodal transportation system where the different modes of transport interconnect to create a safe and efficient intermodal – interconnected system for the movement of people and goods.

Status of Intermodalism and DOTs

Faced with these challenges, researchers at the University of Denver and Mississippi State University proposed a small study to survey the extent to which state DOTs engaged in intermodalism and intermodal planning. Results of a study conducted in 2004, sponsored by NCIT, surveyed 8 states in the US and suggest that after the initial impetus of T-21 and ISTEA in the early 1990s, intermodalism and intermodal planning in the US improved, but may now be leveling off.¹ In this project, we interviewed key officials and obtained questionnaires from over 325 respondents. The following highlights a few of the key results:

- **Comprehensive Plans.** From our analysis of statewide comprehensive plans, we concluded that states are becoming more attuned to intermodal issues. Reviewing the plans from various states revealed that plans drafted more recently consider a variety of modes, rather than just focusing on highways.² Interestingly, the State of Washington’s transportation plan identifies the need to include a “multimodal” perspective. In another example, Florida’s Strategic Intermodal System (SIS)³ Plan was adopted in January 2005 with the intention of integrating and connecting those transportation facilities services, modes of transportation (modes), and linkages into a single, integrated transportation network (system).
- **Organizational Structures.** DOTs have changed to reflect the expanding role of intermodalism. As of 2005, a listing of state DOTs, compiled by the State of Washington DOT showed that approximately 20 states did not have an office devoted to intermodal freight planning. Similarly, our NCIT study concluded that institutional cultures and structures have not kept pace with these changes. In fact, from the 325 completed surveys we obtained, the average rating of whether intermodal planning was effectively incorporated into transportation planning was

¹ Goetz, et. al. (2006).

² Goetz, et. al. (2006).

³ Florida Strategic Plan, January 20, 2005.

2.68 on a scale of 1 to 5 where 3 was to some degree and 2 was to a little degree. In other words, somewhere between a little and some.

- **DOT Staffing.** DOTs remain staffed with a large cadre of highway engineers, and most funding is still directed to the highway mode. Thus, many state agencies are still largely highway-focused. Moreover, our results indicated that there was little support for training in the area of intermodal planning.

Similarly, our study of needed skills and available training programs for intermodal transportation in the 21 member economies of the Asia Pacific Economic Cooperation identified a significant gap between needed skills and education programs.⁴ As a result, APEC has commissioned us to help them develop curriculum and short training courses for their transportation ministries. We have delivered courses in several countries thus far.

A later study of 360 transportation professionals employed in consulting, MPOs, local, regional, or state agencies, concluded that the education curriculum offered by major US universities provided no standard or uniform approach to transportation planning education.⁵ The number of transportation planning courses offered and the content of such courses was seen as highly variable. Furthermore, their results also showed that multi-modal integration of transportation modes was either not covered (31%) or was only a minor portion of the course (39%). In addition, only 5.9% of respondents reported received a full course on the topic.

- **Best Practices.** In general, there were very few intermodal projects. Many of those under construction involve highways in some capacity.

According to industry sources the “best” projects from the freight side include the Alameda rail Corridor serving the Ports of Los Angeles/Lon Beach, intermodal terminals such as the one in Rochelle Illinois, the Chicago CREATE Project, the Heartland Freight Corridor, and the Seattle FAST Corridor, which was designed to decrease highway congestion and increase speed and volume of intermodal freight movements through a pooling of public and private resources. The Freight Intermodal Distribution Pilot Grant Program, authorized under SAFETEA-LU (Sec. 1306), is a good first step. The criteria for awarding the grants, namely to facilitate and support intermodal freight transportation initiatives and to relieve congestion and improve safety, are commendable. The recently proposed *ThruPort*⁶ concept is also a project worthy of additional consideration and funding.

⁴ Jervell, J.J., Perl, A., Sherry, P., & Szyliowicz, J. (2000). Needed skills and available training programs in intermodal transportation. *Transportation Law Journal*, 20, 192-201.

⁵ Handy, S., Weston, L., & Song, J. (2001). The Education of Transportation Planning Professionals. A paper presented to the Transportation Research Board.

⁶ Rodrigue, J. (2006). The Thruport Concept: Reconciling Time and Flows in Rail Freight Distribution. http://people.hofstra.edu/faculty/Jean-paul_Rodrigue/downloads/JPR_Thruport1.pdf

Our opinion, shared with many of the member industries, is that there is a need to prioritize and fund key projects that are “best practices” projects, which clearly serve the national interest. The recent SAFETEA-LU legislation offers some encouragement but currently has little funding.

In terms of passenger intermodalism, there are beginning to be more and better examples of the interconnectivity of modes. Rail line access to major airports is increasing with projects such as the Metro line here at Washington National. Newark, Philadelphia, and San Francisco airports have existing good rail access. Unfortunately, the connectivity issue is highlighted even more when we realize that intercity bus service is available at only 35 out of 150 US airports. This lack of interconnectivity is highlighted even more by the realization that a passenger can not buy a ticket to their final destination. They must buy air, rail, or bus tickets separately.

- **Funding.** There is a lack of funding for intermodal projects. Respondents in our study rated investments for roads and safety fairly high (between “to some degree” and “to a great degree”) but rated investment for transit, bicycle/pedestrian, and intermodal connectors much lower.

Several issues relative to funding should be noted. Most funding and financing decisions, including prioritization, are based on local communities (ie. MPOs, cities, states, etc.). . However, freight transportation is increasingly influenced by global and national activity and while a local community may benefit, typically the local community serves as the through point for goods traveling elsewhere. Studies conducted by the California DOT, for example, estimate that freight traffic coming in to the Port of Long Beach by the year 2020 could more than triple, an increase of almost 350%. Much of this freight moves through the port and into the rest of the country. The demands on the infrastructure are thus created by national demands and not just those of the local community. Therefore, intermodal planning and projects should be supported by a national transportation policy, and the funding may need to come from national sources as well.

The amount of freight activity flowing into and through Chicago is the result of activity at the Ports of Long Beach, Oakland, Seattle-Tacoma, and others. Consequently, the revenue sources for funding projects of regional and national significance will need to be re-evaluated. A mechanism to fund projects of regional and national significance and a policy to prioritize the funding on the basis of economic benefit needs to be developed. The financing of projects should not be mode based, but instead should be based on a prioritization of traffic volume, congestion, and economic impact on the country as whole in order to optimize capital and operating resources.

Currently, the funding is tied to specific modes which perpetuates a narrow modal approach to investment. Unfortunately, the DOT Office of Intermodalism limped

along with no budget for several years and now has been relocated into RITA. I am not sure what the current status of the office is at this point.

- **Dominant Mindset.** Qualitative data from our respondents suggested that highway interests remain dominant in the state DOTs and that an intermodal mindset has not permeated the entire transportation policy community—state transportation commission, state legislature, state DOT leadership, state DOT staff—who are charged with transportation decision-making and planning.
- **Perception of Intermodal Planning.** Intermodal planning processes generally received only average scores, except for public involvement, which was rated more highly. Responses to questions about cooperation and coordination among agencies varied across the states.
- **Safety.** Intermodalism as we define it is concerned with a safe and secure transportation system. Intermodal approaches to transportation have had a significant impact on the improved safety record of the transportation industry particularly with respect to the rail and trucking modes. Intermodal solutions reduce the total number of individual trucks on the road and thereby decrease the risk of accidents due to human factors such as fatigue. The rail industry has continued its steady improvement in operational safety over the past ten years by increasing efforts to reduce human factors caused accidents through the development of an industry supported educational web site that provides scientifically based educational information and training materials for industry members and individual employees. Continued research on the development of technology, training and operating practices to reduce and manage fatigue in the workplace are however, still needed.

Taken together the data can be organized under four general topics, Congestion, Conservation, Capacity, and Competition.

Congestion

Increased traffic congestion will continue to be a challenge. Population increases and increased consumption of goods from Asia will continue to create pressure on the system. Florida is one example of a state that, over the past ten years, has seen its population increase steadily. Projections for the next twenty years suggest a 40% increase in population and a 103% increase in transportation activity.⁷ Despite indications of continued economic growth, it has been projected that there will be significant shortfalls in funding available for the expansion of transportation systems in order to meet the anticipated demands. Consequently, Florida has developed a Strategic Intermodal Transportation System to maximize interconnectedness and cost effectiveness of the various modes of transportation. Data provided by USDOT also predicts increases in the

⁷ Building Florida's Future

numbers of containers by as much as 350% into Southern California. US Transportation Secretary Norman Mineta announced in May 2006 that the Administration is making traffic congestion relief a top priority. Secretary Mineta noted that “congestion kills time, wastes fuel and costs money,” and that America loses an estimated \$200 billion a year due to transportation bottlenecks and delayed deliveries. He added that consumers lose 3.7 billion hours and 2.3 billion gallons of fuel sitting in traffic jams while airline delays waste \$9.4 billion a year. Consequently, with increases in both population and freight traffic, the existing system, which is reaching capacity will be considerably stressed in the future. Furthermore, in the 10 most congested areas, each rush hour travelers “pay” an annual virtual “congestion tax” between \$850 and \$1,600 in lost time and fuel, and spend the equivalent of almost 8 work days each year stuck in traffic. A seamless transportation system will facilitate passenger and freight flows between and among modes, and into whatever mode that would get them to their destination most efficiently and economically. The lack of choice, mandated by modal segregation enhances congestion, decreases productivity, increases resource consumption, and exacerbates pollution.

Conservation

Rising fuel costs have once again gotten the nation’s attention. Former Federal Reserve Administrator Greenspan commented recently on the economy’s resilience and ability to absorb the recent increases in fuel prices, yet warned that there was a limit and that these changes could be felt soon. Fuel prices are expected to continue to rise. The struggling airline industry is doing its best to manage rising fuel costs. Intermodal systems are based on the notion of the most cost effective mode for a particular problem. Accordingly, more emphasis on fuel efficient solutions, or selecting the most fuel efficient mode of transportation for the problem, is desired. Clearly, it is most advantageous to move cars or trucks off the road quickly in order to reduce fuel use. Policies that create incentives to connect buses and light rail to airports are clearly needed. When all airline traffic was grounded during 9/11, it became blatantly and painfully obvious that our modes of transportation were not interconnected and even if you could book a ticket on a train or a bus, you had few options available to get the to the train station or bus terminal often 10 to 30 miles away.

Intermodal connectivity would have reduced this problem. Intermodalism promotes the most efficient mode and the connection of those modes, driving the selection of solutions to transportation problems based on the performance of the mode as opposed to fitting the mode to the problem. This approach then is *customer driven and user focused*, with the best mode applied for the task at hand. By focusing on the performance of the mode, customers obtain the most cost effective choices and services, and for the same reasons increased connectivity is also achieved. An intermodal approach emphasizes a focus on the consumer and customer rather than the planner and the continuation of the status quo.

Capacity

A related concern is the capacity of the transportation system. Intermodal freight traffic is expected to rise about 6% per year. Steve Branscum, Group VP of Consumer Products Business Unit at BNSF recently commented that capacity can be managed with better management and operations. However, he challenged us at the NCIT to identify better techniques for managing intermodal terminals. Productivity at our container terminals needs to improve significantly. Singapore, Hong Kong, and Rotterdam are able to move well over 40 containers an hour while our best systems here in the US are only capable of about 60% of that throughput. Advances in technology and management techniques could narrow these gaps significantly. Similarly, Rodrigue, has argued that existing intermodal freight facilities and port operations could be greatly enhanced by using the *ThruPort*⁸ system, which maximizes the speed of offloading containers onto railcars, drastically reducing the number of moves that must be made to get a container out of an intermodal yard and onto a carrier. Improving productivity and operations would free up more capacity.⁹

Competition

Our transportation infrastructure contributes to our national economic competitiveness. Costs of transportation to businesses dropped from 16% of GDP in 1980 to 10.1% in 2000.¹⁰ I recently attended a meeting of the Asia Pacific Economic Cooperation Working Group in Hanoi, Viet Nam. Interestingly, the economies of our Asian neighbors are booming. Viet Nam has seen steady growth in GDP over the past ten years and is now looking at an 8% rate. Clearly, an efficient transportation system is needed to support economic growth and while low wages can offset the investment needed in transportation infrastructure for a time, there is a limit. Government officials attending the meeting were very interested in attending seminars and gaining skills in intermodal planning and transportation. The lesson is clear, if a developing economy can create an intermodal system now, costs and benefits will accrue steadily over time. Thus, the US will face continued competition in maintaining a highly desirable and competitive business favorable infrastructure.

⁸ Rodrigue, J. (2006).

⁹ Mitra, A. (2006). MEASURING THE ECONOMIC IMPACT OF THE TRANSPORTATION, DISTRIBUTION, AND LOGISTICS INDUSTRY IN NORTHWEST INDIANA. Purdue University – Calumet.

¹⁰ Lockwood (2003). Intermodalism: Multimodal vs. Intermodal Transportation. Paper presented at the Transportation and Technology Forum. March 2003.

Recommendations

- **Research on alternative funding mechanisms are needed.** Transportation problems are created by larger systems and forces, yet funding is tied to local concerns.
- **Create a single source of funding.** Financing of transportation projects should not be tied to mode specific funds. Transportation should be considered a total system throughout the nation. Defining a mechanism to pool funds and then to prioritize the funding of nationally important projects based on criteria that will decrease congestion and improve economic outcomes is the most desired approach.
- **Establish an Undersecretary for Intermodal Policy.** The USDOT established an Office of Intermodalism but it lacked appropriate resources and likely the political clout, to effect meaningful change. Currently, its address is under review. Intermodal connectivity and planning need to be a central focus of the DOTs strategic freight plan. Intermodal is not mentioned in the current *Framework*. DOT needs an Undersecretary for Intermodal Policy.
- **Reform the federal role.** The USDOT should be user-focused and service oriented rather than modally focused. Changing the perspective of the DOT from mode-focused to user-focused will decrease emphasis on individual modes and increase likelihood of selection and development of most efficient mode. Developing separate policy functions that address passenger and a freight issues would be a significant improvement.
- **Create improved incentives for collaboration** and coordination of planning at the local, regional, and state level.
- **Encourage public-private partnerships..** Encourage public-private partnerships that maximize the financial resources and collaboration between planners.
- **Research operational and managerial improvements.** There seems to be limited funding for development of best practices or demonstration projects. For example, the *ThruPort* concept could be very significant and lead to the creation of third generation intermodal terminals, but it needs more study.
- **Encourage Intermodal solutions as a means of improving safety.** Intermodal solutions decrease risk of accidents. Additional efforts to improve educational and technological efforts to reduce human factors caused accidents are needed.
- **Workforce development through education and training programs.** Develop programs that provide the conceptual and analytical training needed to implement intermodal solutions. Few programs are available that provide comprehensive and systematic training for key decision makers. Most executives of public and private transportation companies and organizations come up through specific modes. A model program is the Master's degree in Intermodal Transportation Management offered by the University of Denver.

Contact Information:

Professor Patrick Sherry, Ph.D.
National Center for Intermodal Transportation
University of Denver
2450 S. Vine Street, #232
Denver, Colorado 80208

303-871-2495

psherry@du.edu