

U.S. Department of Transportation's Research and Development Needs for the Future

Mortimer L. Downey, *U.S. Department of Transportation*

Let me begin with a transportation example from nature, Canadian geese. Have you ever watched them flying in their V formation? Ever wonder why one wing of the V is longer than the other? After years of study and research, we have the answer. The long wing has more geese.

The fact is geese instinctively know the value of cooperation. For example, they regularly change leadership—every few minutes—because the leader fights the head winds to make flying easier for the geese behind him. When he or she becomes exhausted, another goose takes over. Scientists have discovered through wind-tunnel tests that a flock of geese can fly 72 percent faster and farther by cooperating in this way.

The lesson is applicable for us in intermodalism. "Intermodalism" is a buzzword if there ever was one, but in fact it means nothing more and nothing less than "cooperation." It is easy to get caught up in process and forget what intermodalism is all about. It means cooperating to increase our transportation system's efficiency and its benefits for the American people. Intermodalism's promise has been somewhat obscured by the questions that surround it, questions that over the last few years have gone from "Huh?" to "Why?" to "How?" and finally now going to "When?"

There has been tremendous progress on improving intermodal connections both in the private sector and in military traffic, advances like double-stack trains. Projects like the Stark County, Ohio, Intermodal Project are becoming so common they are almost taken for granted. There has been a tendency to forget or to dismiss the progress that we have seen. Indeed, some people see that 4 years have gone by since 1991 when the Intermodal Surface Transportation Efficiency Act (ISTEA) was passed and wonder why its full promise has not yet been realized. Well, neither Rome nor the Interstate Highway system nor the New York subway system was built in a day, and we are not going to have full intermodal connectivity in a day or even after 4 years.

Integrating our transportation systems with their physical and technological differences, geographic dispersions, different owners, different customers, and different patterns of labor organization will take an ongoing effort that stretches over many years. But that effort, no matter how complex, no matter how demanding, is essential and we need to continue it. We

continue to face growing travel demand, inadequate capacity, bottlenecks, poor connections between modes and an aging and deteriorating infrastructure. We cannot take any of that lightly, and we do not.

INVESTING IN NATIONAL PROSPERITY

DOT's recent report on the nation's surface transportation system did not surprise anyone when it concluded we should be putting \$57 billion a year into our surface transportation systems alone just to maintain the current conditions. And of course, simply maintaining the current conditions will not give the economy the capacity it needs to grow. That is why the report also concluded that an additional \$23 billion a year could be invested in projects whose quantifiable benefits, such as savings from congestion reduction, would outweigh their costs. So that is \$80 billion that as a nation we ought to be investing each and every year. But when you add up what all levels of government now spend, it is only about \$40 billion a year on surface transportation infrastructure, suggesting we have a gap of almost \$40 billion.

Closing that deficit in today's environment of limited public funding, especially when other public services have their own legitimate needs, means going beyond the ways of doing business that have driven transportation policy for the past 40 years. Let us face it, we cannot just build our way out of the congestion and the other problems we face. We do not have the money to do so. Not even the military has the money to do so. We do not want the impacts on environment that doing so would bring, and there are serious questions about the long-term effectiveness of a build-build strategy.

But that does not mean that we can turn our backs on legitimate needs or on the opportunity to support economic growth; nor can we turn our backs on the national security needs that our transportation system supports. Our existing transportation facilities will continue to be the backbone of our mobility, and we are going to have to maintain and even expand the network of transit systems, roads, ports, and railroads that has been so critical to our nation's prosperity.

Intermodalism will help us enable the system users, the military, private shippers, and government transportation agencies to use the best mode or combination of modes to meet their needs in moving people and goods and reduce the burden on system segments, especially when such a strategy is cheaper than major new construction. Doing that means ensuring good compatible connections between modes and providing genuine consumer choice.

These choices, however, are becoming more complex. Simple point-to-point options and modes are being replaced by complex routing through networks and options to locate economic activities anywhere on the globe. Although government (especially at the federal level, which by definition must take a national perspective) clearly has a critical role to play, much of the investment has to be done through market mechanisms that build on the transportation systems that have been built up over generations and that on the whole still work well.

This cannot happen through top-down government directive. That approach has failed around the world in recent years. Instead, government's role in promoting intermodalism has to take different forms. We should continue our efforts at deregulation to end economic distortion, and allow markets to take their natural shape, which should provide greater authority to state and local decision makers in their provision of investments.

Acting first under President Carter, and now in this Administration, the federal government has essentially ended economic regulation in the trucking, rail, air passenger, and cargo sectors and recently closed the doors on the 107-year old Interstate Commerce Commission. This has given consumers more choices and billions of dollars of savings while enabling providers to enter into new markets and introduce new efficiencies.

The federal government, with its resources and its national perspective, can help to develop the analytical tools and the data bases that can enable businesses to make sound choices. For example, DOT has been working with the Los Alamos National Laboratory on developing innovative performance and operations systems models and other new analytical frameworks that will help us better understand entire transportation systems and how they work.

ISTEA'S ROLE

The federal government can also empower state and local agencies to use federal funds more flexibly and to make investment decisions that are right for them as linkages into the national network. Two billion dollars in ISTEA funds have already been transferred to mass transit in this way, which has helped relieve pressures on congested urban highway corridors. ISTEA funds have also been used not only for passenger service but for freight projects as well. These dollars improved road connections to the Columbus Inland Port facilities in Ohio and financed bridges for what will become the Alameda corridor, rail access to the ports of Los Angeles and Long Beach.

As ISTEA has mandated, government at all levels must improve their transportation planning process to ensure that the best projects are chosen for investment of federal funds—projects that meet genuine needs. At all levels of government and in the private sector, we can work to ensure that the new technologies now being developed and deployed, such as intelligent transportation systems or global positioning satellites, are by design intermodal and make the transfers between systems as seamless as possible. These new technologies can also be developed to link into the information systems that allow military and private users to more effectively manage their operations, as some already do through just-in-time delivery systems that in reality are mobile logistics programs. Government also can encourage transportation system optimization, but do it in ways that do not involve top-down control of civilian systems.

America's evolving transportation systems have some of the same attributes as the Internet—decentralization, immense capacity, and unique opportunities for creative use. We need to enable the development of systems to harness and integrate the transportation system's power without impeding it. All of these things most of us could agree with in principle, but I am sure there will be great debate about the specifics; that is why conferences such as this one are so valuable—representatives from transportation agencies, from the military, and from business brought together to discuss how to better integrate and improve the transportation network of which we are all a part. These meetings can help to develop a common language, a shared understanding. That such meetings and other activities are now common is a big step in itself, but only a first step. It is results that count. We are now cooperating to achieve results through the topic of this conference—research.

DOT'S ROLE

We at the federal level believe we can provide the leadership in this effort. We have already done some of this through steps that I mentioned earlier, and we will continue to build on those. We are also continuing the integration of activities that in the past have been confined within the modal stovepipes.

The creation of the Office of Intermodalism and of a DOT-wide Directorate of Technology Deployment are steps in this direction. We have also ensured that the newly created Bureau of Transportation Statistics (BTS) is intermodal in its orientation and available to provide data that are useful for all modes and all sectors. BTS is already a key player in the development of vital information analysis tool kits being used by private- and public-sector analysts.

DOT is also devoting increasingly greater proportions of its research to intermodal topics and to programs that transcend the modes. Through this research, we hope to develop solutions to the nontechnological obstacles that intermodalism faces—the institutional, the financial, and the educational barriers. For instance, although ISTEA requires consultation among the various interests, including freight operators, during the development of metropolitan transportation plans and programs, many areas lack the mechanisms and the structures to really carry out such consultation effectively.

Who pays for intermodal projects is another issue. Given funding constraints, some are reluctant to contribute to projects that they do not see as wholly their turf. The Stark County,

Ohio, project I mentioned earlier actually shows how those barriers can be overcome through innovative financing that can bring together public and private interests. We need to bring those kinds of results to people's attention. On the other hand, there are legal and regulatory barriers that discourage intermodalism such as the prohibition against using airport revenues for off-airport highway or rail links, even when they would clearly benefit airport users, or the limits on states' abilities to invest in Amtrak capital improvements.

There is also a genuine lack of training in cross-modal or intermodal issues. We still train people to be highway engineers or railroad designers or transit planners and then fail to provide them with the information and tools they need to assess and meet challenges in a world that increasingly is looking for intermodal solutions.

Given this, DOT believes it is critical to shift some of our research resources into the soft side, that is, into policy and institutional research. And although we must continue our long-standing commitment to hardware (and we are doing that often in partnership with DOD through ARPA in areas like Intelligent Transportation Systems and Global Positioning Systems, where we have greatly expanded our federal commitment), we have to do more in terms of policy and institutional research.

Over the past few years, we have heard from many of you that we should place less emphasis on conventional activities and develop a broader research agenda that will help you better understand how transportation shapes the economy, affects the environment, and influences the quality of life. Moreover, transportation organizations at all levels are continually interacting with each other and need to increase their ability to do so effectively. Areas like public participation, awareness, consensus building, mechanisms to involve the private sector and other levels of government, technical tools, and policy alternatives are all vital and they demand research.

We have a number of ongoing efforts that respond to these needs in each of the three areas I mentioned—institutional, informational, and educational. We have taken steps on the institutional front. Many of you participated in the 1995 TRB meeting in Irvine, California, that focused on building a joint research agenda for intermodal freight issues. Our highway policy research now includes analyses of investment requirements and alternative funding strategies, better quantification of highway's economic importance, better travel forecasting and data collection methods, and studies of the implications of alternative fuels and of demand management. Through FHWA, we are identifying barriers to local-level intermodal planning and operations. We are also improving such analytical tools as geographic information systems to support national program evaluation for information and data sharing with other levels of government and with business.

On the informational side, DOT is acting to improve data availability on all aspects of system performance and for the systems that collect and distribute these data. That is essential for effective intermodal planning and decision making in both government and business. As I mentioned earlier, BTS has expanded its initiatives. They have been producing and distributing data both to the public and the private sector. They are now doing major surveys, the first in recent years, on domestic freight movements and domestic passenger movements and the flow of freight across the borders; and they are integrating data from a variety of other surveys and studies. This work, bringing together commodity flows and passenger information, can provide leaders with the information they need for investment decisions.

We are taking steps on the educational front. We know that new technologies, concepts and institutional policies are changing the world in which we work; that an intermodal world demands both a broad and deep knowledge of many areas; and that keeping up is not easy. We are providing educational and training assistance through a variety of activities, including targeted third-party training, sponsorship of university programs, and continuous direct outreach.

We do not yet have a national intermodal transportation institute, but both the National Transit Institute and the National Highway Institute support intermodal programs that offer training and employee development in areas across the traditional lines. The Rural Transit Assistance and the Motor Carrier Safety Assistance Program also provide extensive intermodal training and technical assistance.

Our university research programs currently contribute about \$60 million annually to these institutions through both the University Transportation Centers Program and the ISTEA established university research institutes. They not only develop the next generation of transportation professionals, but also spur the development of innovations through ongoing research targeted at intermodal needs.

Finally, we are undertaking extensive outreach on research issues through the Volpe Center in Cambridge and through the Turner Fairbanks Center here in Washington. These centers also hold technical forums and provide informational exchanges on a variety of issues.

All of these efforts contribute to an intermodal research agenda that not only will provide technological solutions but also address the institutional, the informational, and the educational issues that can impede progress toward a seamless intermodal system.

I have talked about DOT's vision for intermodal research and development, our guiding principles, and our priorities and objectives. I would like to ask you to consider these closely in your deliberations today and tomorrow, remembering that what we all have in common is far greater than how we differ and that through cooperation we can overcome the barriers we face. Your viewpoints, your knowledge, your experience are going to be extremely helpful as we reach judgments about federal transportation research and development, and we look forward to hearing your views.