

**STATEMENT OF THE HONORABLE MORTIMER L. DOWNEY
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COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
SUBCOMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE
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Introduction

Good morning, Mr. Chairman, Senator Baucus, and members of the committee. On behalf of Secretary Slater, I thank you for the opportunity to discuss innovation in transportation. When Congress passed the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, it recognized that our transportation system faced daunting challenges: rapidly-increasing travel, an aging and deteriorating infrastructure, environmental and air quality problems caused by the transportation system, and the need for greater efficiency and better connections between transportation modes.

ISTEA increased infrastructure investment to record levels to help meet these challenges, and the results are visible in new and expanded highways, transit systems, and intermodal facilities. However, Congress recognized that federal funding alone could not meet all of our needs, nor would construction always be the right solution. Consequently, ISTEA also promoted innovation: new technologies, new ways of financing projects, and new ways of doing business.

ISTEA is now in its sixth and final year, and as we prepare to reauthorize its programs we are reviewing how its initiatives have fared. The consensus opinion, as discerned from more than one hundred outreach sessions, focus group discussions, and other meetings with our constituents, is clear: ISTEA is working well, and needs only modest refinements, not major reforms.

No aspect of ISTEA received greater approval from our constituents than its promotion of innovative approaches to transportation. Consequently, our reauthorization proposal will build on the foundation laid by ISTEA to sustain our existing commitment to innovation by establishing new infrastructure funding initiatives and technology deployment programs.

My testimony on how ISTEA's programs have worked reviews several areas where innovation has flourished: transportation project finance; new approaches to contracting; advanced materials and project methods; intelligent transportation systems; and other research and development activities.

I understand that safety will be the subject of an upcoming hearing to be held by this committee and that the Department will have the opportunity at that time to present testimony on how ISTEA has fostered innovation in transportation safety.

We will also be addressing environmental issues at a future hearing, but I would like to briefly note our progress in addressing environmental concerns. ISTEA created two innovative and successful environmental programs, the Congestion Mitigation and Air Quality Improvement Program (CMAQ) and Transportation Enhancements Activities (TEA) funding, which increased state and local officials' ability to target funds to projects that help their communities. CMAQ has proven to be one of ISTEA's most flexible programs, and our proposed changes to this program would make it easier for areas that do not meet particulate matter standards to receive CMAQ funds. Under the TEA, states have carried out projects that help transportation facilities fit better into communities, by preserving historic transportation facilities, building bicycle and pedestrian paths, and mitigating storm water runoff. In our reauthorization proposal, we are recommending codifying the requirement that these activities have a direct link to surface transportation. Under these two programs, ISTEA has stimulated hundreds of successful projects that prove that transportation can enhance the environment.

Innovative Finance

Transportation providers face a difficult challenge today: the gap between needed infrastructure investment and available resources is significant and growing. In response, we have been actively encouraging the development of innovative ways to attract new sources of capital to infrastructure investment and to eliminate inefficiencies in program delivery that add to costs. Innovative financing is an umbrella term used to describe these objectives, and it encompasses a wide range of strategies targeted at cutting red tape to move projects ahead faster and at leveraging federal funding with private and nontraditional public sector resources.

These strategies grew out of both ISTEA and President Clinton's Executive Order 12893, "Principles for Federal Infrastructure Investments," which instructed federal agencies to promote innovation, encourage private sector participation in infrastructure investment and management, and use federal funds more efficiently.

The Partnership for Transportation Investment

Experimental provisions within ISTEA led to the development of innovative solutions for project finance shortcomings including the extension of loans to fund projects with potential revenue streams and the development of the turnkey approach to transit project delivery which focuses on advancing new technology and lowering the cost of constructing new transit systems.

Two years ago, we announced the Partnership for Transportation Investment, a pilot program which built upon ISTEA's provisions regarding these strategies and others, such as toll credits for state matching funds and the federal reimbursement of bond financing costs.

To date, the Partnership has included over 70 projects in more than 30 states with a total construction value of over \$4.5 billion, including more than a billion dollars in new capital

directly attributable to this program. Many of these projects are advancing to construction an average of two years ahead of schedule.

For example, the State Highway 190 Turnpike project in Texas, delayed for three decades by inadequate funding, is underway because federal funds have reduced the state's borrowing costs and strengthened its access to the capital markets. This \$700 million project, which will help to link four freeways and the Dallas North Tollway, used \$135 million in state-loaned federal funds to support highly-rated, revenue-backed bonds. This support will reduce loan and bond repayment costs (resulting in lower tolls for drivers) and will allow this project to be completed 11 years earlier than through conventional financing.

The Massachusetts Bay Transportation Authority was granted advance construction authority to issue bonds to rebuild its heavy rail maintenance facility. This \$236 million project was undertaken 30 months earlier as a result, with immediate construction savings of over \$50 million. In addition, each repair and overhaul undertaken after 1996 will take up to one-third less time to complete.

The Turnkey procurement process is being successfully implemented. For example, in New Jersey, on the Hudson-Bergen project, bids had to include a grant anticipation note to cover the shortfall between the construction cash flows and grant receipts. The Turnkey manager for the project will provide a letter of credit for up to \$200 million over a three-year period which will be backed by the U.S. Department of Transportation and the New Jersey Transportation Trust Fund.

With an innovative financing grant, the Mississippi department of transportation leveraged an additional \$1.5 million in economic development funds and local debt with which it is building two regional transportation centers to serve eight rural counties. These transportation centers will provide 20 percent more transit service with no increase in operating costs.

In Missouri, as a result of the Partnership for Transportation Investment, the department of transportation and an entrepreneur joined forces to install fiber-optic cable within the highway right-of-way. This cable will be used for private telecommunications services, but also will serve, at no cost to the state, as the backbone of a statewide intelligent transportation system.

Also through the Partnership for Transportation Investment program, the state of Ohio, the City of Cincinnati, and Norfolk Southern formed a partnership to carry out the construction of 3.5 miles of new track and the improvement of four rail bridges. The project, two-thirds of which was funded by Norfolk Southern, has alleviated congestion on rail lines and at grade crossings within a 60-mile radius of Cincinnati. As a result, this project has helped the region to reduce pollution and meet its air quality goals.

In Stark County, Ohio, the state-supported construction of a \$35.2 million intermodal facility enables the transfer of freight between trucks and rail cars. A state loan of federal-aid funds to the private developer who built the interchange made its construction feasible, and fees paid by

facility users will repay the loan. The project has already attracted \$24 million in private funds, and over the next decade could produce \$500 million in new investment and 5,000 new jobs.

A rail project, involving the city of Fort Collins, the state of Colorado, Burlington Northern Santa Fe, and Union Pacific, is consolidating and relocating track to eliminate 16 grade crossings throughout the city. In addition, new signals are being installed at several other crossings. These actions will enhance air quality, highway traffic flow, and rail-highway safety.

In addition, the Chicago and Soo Line Railroad are jointly funding a \$35.1 million project to improve access into and out of a major rail facility in Chicago with the railroad funding all but \$2.1 million of the cost. The benefits of this project are estimated as a \$2.6 million savings in reduced waiting time at rail-highway grade crossings in addition to the benefit of reduced pollution. Public safety will also be enhanced by the reduced exposure to trains at crossings, and additional capacity for Chicago commuter rail service will result from this project as well.

In the National Highway System Designation Act of 1995 (NHS Act), Congress made permanent many of the experimental strategies used in these and other projects, and they are now a regular part of how we do business.

State Infrastructure Banks

We are continuing to develop initiatives aimed at enabling states to leverage federal dollars. Notable among these are state infrastructure banks (SIBs), which evolved from ISTEA's provision allowing states to loan part of their federal grant funds to transportation projects. SIBs use federal seed capital to leverage private and other non-federal public investment through loans and credit enhancement assistance.

Congress authorized a pilot program when it passed the NHS Act and provided \$150 million in the fiscal year 1997 Department of Transportation appropriations act to fund SIBs in states participating in the program. Currently, SIBs have been approved for 10 states: Arizona, California, Florida, Missouri, Ohio, Oklahoma, Oregon, South Carolina, Texas, and Virginia.

Ohio's bank is the most advanced, having already loaned Butler County \$20 million to support a \$100 million bond issue. Florida, Missouri, Oklahoma, and Oregon are expected to make loans by October of 1997. The following list of other projects to be supported by SIBs in the coming year illustrate the flexibility they afford to states seeking to tailor aid to the needs of specific projects.

In Oregon, a SIB loan combined with commercial bank financing will reduce interest debt on vanpool leases in the Portland area and thereby save users 26 percent. This project will encourage ridesharing, with consequent decreases in congestion and air pollution.

Missouri's Springfield Transportation Corporation will use a sequenced, two-loan strategy to speed up significantly a \$33 million road construction project and to reduce interest costs. The first loan will enable pre-construction work to begin without waiting for the full federal share of funds to be accumulated. The second loan, with below-market interest rates, will finance the project's construction bonds, saving area residents several million dollars in interest costs.

In addition, Missouri's SIB will use a Missouri department of transportation grant to capitalize its transit SIB account. The initial capitalization of \$1 million will support a loan for the purchase of light rail vehicles for St. Louis' transit system.

The SR 80 Interchange in Palm Beach County, Florida, will use an interest-free SIB loan to finance interest costs during construction and the first five years of operation, a period in which anticipated revenues from this toll project would otherwise be insufficient to pay its costs. After this time, revenues should be adequate to pay the construction debt, and the project will be able to sustain itself.

These are examples of projects now in development. Our reauthorization proposal expands the number of participants in the state infrastructure bank program and provides additional federal seed funding to help them get started.

Credit-Based Strategies

SIBs are not the only financial strategies we have been exploring. We have worked to provide contingent loans for toll roads in Orange County, California and a direct loan to California's Alameda Corridor.

These types of projects are of national significance because of this region's role as a global gateway, but might not have been feasible without the credit assistance provided by the federal government.

In our reauthorization proposal, we would create a \$100 million per year federal credit program to target assistance to critical projects of national significance, including trade corridors, intermodal facilities, bi-state connectors, and international border crossings.

This program would offer a cost-effective mechanism for financing important national infrastructure projects and would encourage more private and other nonfederal investment.

Innovative Contracting

In examining ways to improve project delivery, we have actively encouraged the development of innovative contracting practices by working with state transportation departments to test practices that promise to reduce project life-cycle costs while maintaining quality and

contractor profitability. Among the techniques which have been evaluated are design-build procurements, cost-plus-time bidding, and lane rentals.

Design-Build Procurements

The design-build process gives the contractor maximum flexibility in the selection of design and construction methods. Under the design-build approach, the contracting agency merely identifies a project's desired results and establishes minimum criteria for its design. Prospective bidders then develop proposals that optimize their workforce, equipment, and scheduling to cut costs and enable innovation.

Another significant benefit is the potential time savings resulting from design and construction being awarded under a single procurement which allows construction to begin before the design details are final. These contracts also reduce the state transportation staff required for projects, an important factor in an era of downsizing.

Fourteen states are carrying out experimental design-build projects: Alaska, Arizona, California, Colorado, Florida, Maine, Michigan, Minnesota, New Jersey, North Carolina, Ohio, Pennsylvania, South Carolina, and Utah.

These projects range from pavement rehabilitation to bridge replacement to the construction of ferry boat facilities. For example, Utah is currently preparing to launch a \$1.4 billion design-build project which will save three years in the expansion of I-15, a project undertaken to prepare for the 2002 Olympics.

The benefits of design-built have been demonstrated in Florida where, in the 1980s, the state department of transportation administered a state-funded design-build project which was comprised of thirteen projects with a total contract value of \$40 million. The results of this program indicated that the total completion time for design-built projects was up to 40 percent less than the time required to complete conventional design-bid-build projects.

Cost-Plus-Time Bidding

Cost-plus-time bidding formally links the completion of construction projects with the cost of delays to system users. Cost-plus-time bids reflect not only the estimated cost of construction but also the time required to complete the project. Contract awards are based upon both factors, which requires bidders to minimize construction-related delays.

This strategy was used effectively in the reconstruction of the California freeways after the 1994 Northridge earthquake. Road user costs were reduced by approximately \$47.7 million, and the total contract time for all ten projects was lessened by 450 days.

In addition, the New York State Department of Transportation (NYSDOT) let 24 cost-plus-time bidding projects between February 1994 and August 1995. At the time of NYSDOT's 1995 interim report, nine projects had been completed, and the state estimated that the total cost savings for these nine projects was between \$3 and \$4 million.

Twenty-seven states and the District of Columbia have tested cost-plus-time bidding, and have reported good results: contract times have been reduced, costs have been acceptable, and quality has been maintained. It is now an accepted way of improving operations for federal projects and is no longer considered to be experimental.

Lane Rentals

Like cost-plus-time bidding, the goal of lane rentals is to encourage construction contractors to minimize impacts on system users. Under this approach, rental fees based upon the estimated cost of delays or inconvenience to users are included in construction contracts, and the contractor is assessed for the time that operations occupy the roadway and cause delays.

Six states have experimented with lane rentals with varying degrees of success. Indiana, for example, experienced great success with an I-70 pavement rehabilitation project that utilized the lane rental concept along with other innovative contracting concepts. As a result of the lane rental specifications, the contractor scheduled his work to minimize public inconvenience and completed the work 50 days ahead of schedule with a reduction in lane closures by more than one third.

Like cost-plus-time bidding, lane rental is now an accepted way of doing business.

Innovations in Methods and Materials

Maintaining and upgrading pavement and bridges is crucially important, and we have worked through programs authorized by ISTEA to encourage the development and use of advanced building materials.

SUPERPAVE

SUPERPAVE (Superior Performing Asphalt Pavements) consists of three related elements designed to increase the life of pavement: a performance-based asphalt binder specification, volumetric mix design and analysis using a gyratory compactor, and mix analysis tests and a performance prediction system that reflects such environmental factors as weather. Taking these factors into account can lead to a significant increase in pavement life, and we have encouraged state agencies to obtain the training and equipment needed to take advantage of this innovation.

High-Performance Concrete

We are working with state and local governments, universities, and industry to develop high-performance concrete, an innovation which offers significantly increased design life and durability. Use of high performance concrete will result in substantial first cost savings because bridges can be built with longer spans, fewer girders or beams, and longer life cycles. It already has been used to build a bridge in the Houston area, and a dozen other states have decided to begin using it in their bridge construction. Eight states also are experimenting with this concrete for pavement.

High-Performance Steel

We are also sponsoring research in high-performance steel to improve the steel used in bridge construction. High-performance steel is tougher and more easily-welded than steels previously available. Its improved weldability enhances the efficiency and reliability of the fabrication process, and its increased durability reduces the need to maintain or paint the structure it is used to construct.

High-Performance Composite Materials

We have sponsored studies of the use of fiber-reinforced polymer composites to repair damaged bridges and to strengthen existing bridges against earthquakes. For instance, a broken concrete bridge beam repaired using composite material epoxied to its exterior was actually 50 percent stronger than when new. Such methods can reduce repair and strengthening costs to just one-fourth to one-third of the cost of conventional methods. Since these materials are much lighter than traditional structural materials, foundations can be smaller, transportation costs are lower, and materials handling is easier during construction.

Intelligent Transportation Systems

ISTEA established the Intelligent Transportation Systems (ITS) program to further the development of advanced information and communications technologies across all of the modes to cut congestion, improve safety, enhance intermodalism, and reduce the environmental impact of growing travel demands. During the past five years, our activities through this program have laid the foundation for an information and communications infrastructure designed to facilitate management of the multiple transportation systems as one system for greater customer service.

These ITS applications can reduce, by about 35 percent, the cost of the new infrastructure capacity we will need over the next decade, much as improvements in air traffic control have enabled us to handle more planes without adding new airports. For example, an ITS application enabling electronic clearance for trucks has been estimated to reduce the operating costs of weigh stations by up to \$160,000 annually per state. In addition, through ITS deployments, government transit costs may be reduced by an estimated \$3 to \$7 billion over the next decade.

ITS applications also have the potential, through radar-based collision-avoidance systems, to improve safety. Crash avoidance systems are expected to reduce accidents by 17 percent, saving thousands of lives and an estimated \$26 billion per year in direct and indirect costs to our communities. In addition, through the application of global positioning satellite systems, ITS applications can help to track freight throughout the shipping process, improving the efficiency of “just-in-time” deliveries.

Under the authority provided by ISTEA, we are working with state and local governments and the private sector on a program of research, architecture and standards creation, and technology transfer and training to accelerate the development and deployment of ITS technologies.

These efforts have produced a national ITS architecture and five cooperative relationships with technical standards developing organizations. These efforts will ensure that ITS programs will be nationally compatible and interoperable by helping to break down the modal and institutional barriers which otherwise could hinder ITS development. They will encourage integrated deployment by public agencies and foster investment by entrepreneurs otherwise unwilling to make commitments without stable markets.

We have already seen successes, such as those in Minneapolis, where reduced congestion has improved freeway speeds by 35 percent and where lives are being saved because emergency response times have been reduced by 20 minutes. In California, ITS has lessened traffic congestion significantly through the Automated Traffic Surveillance and Control (ATSAC) system which controls traffic on streets feeding into a highly congested portion of the Santa Monica freeway to balance traffic demands between the freeway and parallel arterial streets. The reported benefits of this ITS application have been impressive, including a 13 percent reduction in travel time, a 35 percent reduction in vehicle stops, a 14 percent increase in average speed, a 20 percent decrease in intersection delay, a 12.5 percent decrease in fuel consumption, and a 10 percent decrease in harmful emissions.

Other successful applications of ITS technology include the electronic payment of transit fares which has saved New Jersey, for example, an estimated \$2.7 million in labor costs. In Lexington, Kentucky, coordinated computerized traffic signals have reduced “stop and go” traffic delay by 40 percent and reduced accidents by 31 percent between 1985 and 1994. The use of ITS technology by Maryland has enabled a Montgomery County cable station to show traffic conditions of major highways in 180,000 homes and consequently reduce congestion by steering commuters and others away from the more crowded routes. In Oklahoma, electronic toll collection has resulted in savings of more than 90 percent per lane, annually, and through Kansas City’s transit management system implementation, transit officials have reduced operating costs by \$400,000, have avoided \$1.5 million in new bus purchases, and have cut the response time to emergencies from 4 minutes to 1 minute. In addition, Seattle’s implementation of ramp metering has kept traffic moving and cut accident rates by more than 60 percent, despite an increase in traffic levels.

We are building on such early successes through Operation Timesaver, which is aiding state and local governments in creating a national ITS infrastructure to cut urban travel times by 15 percent over the next decade. We have taken the first steps with model deployments of integrated travel management systems in four metropolitan areas, and of commercial vehicle intelligent systems in eight states.

In addition, we have actively encouraged the development and implementation of ITS applications for rural transportation systems. Research and development activities currently underway include evaluation and identification of advanced traveler information systems, development of motor vehicle safety warning systems utilizing, for example, in-vehicle emergency notification systems to alert a network of responders, and development of comprehensive traveler information systems, incorporating road, transit, weather, and value-added information for an entire geographic region.

In the longer term, we are exploring the concept of a truly automated highway system. This activity will greatly enhance transportation safety in the future, and will also, in the meantime, engender innovations increasing the safety of operations on our existing roads and vehicles. I would also like to report that we will meet Congress's mandate to demonstrate the feasibility of such a system through a test on San Diego's I-15 this August. Another innovation under development is a fully-integrated, intelligent vehicle designed to deliver the right information to the driver at the right time.

To build upon these ground-breaking developments, our reauthorization bill includes incentives to assist metropolitan areas in integrating their ITS infrastructure, as well as major training, standards, and technical assistance programs to support state and local officials in the deployment of ITS for metropolitan as well as rural and commercial uses.

This proposal also would establish a program to continue research and to support deployment activities such as standards development, training, and technology transfer. This research component also would support automated highway system research and the continued development of in-vehicle collision avoidance capabilities associated with integrated intelligent vehicles.

Other Transportation Innovations

We are working to improve train operations through the application of the Global Positioning Satellite System, digital data radios, and onboard supervisory computers. Not only will these technologies improve safety, they also will enhance freight productivity today and enable the implementation of safe high-speed passenger and freight operations.

Our Advanced Public Transportation Systems program uses ITS technologies to improve transit efficiency and customer service. It supports such applications as automatic vehicle locators, onboard and wayside passenger information links, electronic fare collection, and automated

dispatch systems for demand-response services. For example, through this program, the first technical standard for vehicular data communications in ITS applications was developed. This standard will make it possible for many different hardware designers and data providers to develop and deploy in-vehicle information and automated vehicle tracking systems that can function together to provide driver and passenger information, as well as vehicle and fleet management data.

Advanced train controls are being developed to enhance the safety of passengers, engineers, and maintenance crew in rapid rail systems. As transit ridership increases, the transit system must install more rail sets and run these sets more closely together. To counteract the resulting risks, sophisticated signaling and control systems have been developed. Such systems can identify obstructions on the right-of-way which are imperceptible to the engineer and can signal a malfunction in a train's subsystems when the train is still in motion. In addition, they can bring a train to a safe, controlled stop in the event that the engineer becomes incapacitated.

The Advanced Technology Transit Bus (ATTB), also known as the Stealth Bus because of the space age composites and methods use to build it, is currently being tested. With an expected useful life of 25 years, the ATTB is expected to reduce maintenance costs per mile by fifty percent. It will be one-third lighter than existing buses, thus reducing wear on road surfaces, and with its hybrid electric engine, it will cut emissions by over 60 percent.

Conclusion

The innovations made possible by ISTEA are improving operating efficiency, cutting operating costs, and increasing the useful life of transportation facilities and equipment. We will see their benefits well into the next century.

We now must build on the accomplishments of the last six years by reauthorizing the many programs which work, refining those programs which have not yet fully realized their promise, and creating new initiatives which apply what we have learned from implementing ISTEA. We will submit our reauthorization proposal very shortly, and we look forward to working with Congress to make it a reality.

Mr. Chairman, that concludes my statement, but I would be happy to answer any questions.

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