The Transportation Research Board's 2008 FIELD VISIT PROGRAM

Making Certain Progress in Uncertain Times

Specialists in the Transportation Research Board's (TRB's) Technical Activities Division identify current issues, collect and generate information on the issues, and disseminate the information throughout the transportation community. The TRB Annual Meeting, TRB-sponsored conferences and workshops, standing committee meetings and communications, publications, and contact with thousands of organizations and individuals provide TRB staff with information from the public and private sectors on all modes of transportation.

A major source of this information is the TRB field visit program. Senior program officers in TRB's Technical Activities Division meet on site with representatives of state departments of transportation (DOTs) and with representatives of universities, transit and other modal agencies, and industry. In addition, TRB staff members are involved in planning and delivering conferences, workshops, and meetings. This report presents a summary of what the TRB staff learned from these visits and activities during the past year.

Photo: Caltrans

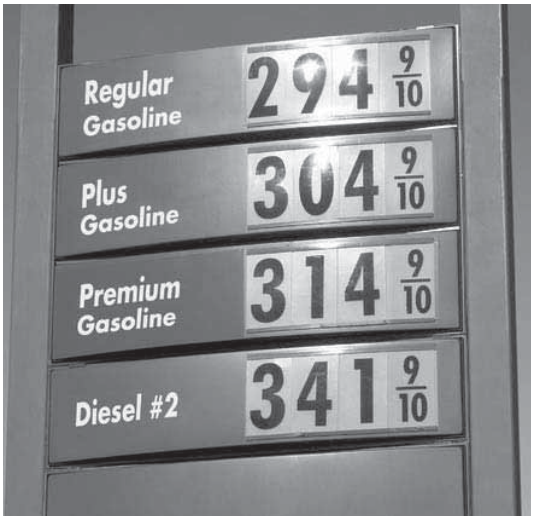
Photo: FHWA and TRANSTEC Group

Photo: Caltrans

Uncertainty was the prevailing concern among transportation organizations in 2008. The uncertainties mentioned most often included the following:

- The deepening economic recession, its length, and its impacts;
- The massive fluctuations in the cost of fuel, and the short- and long-term effects on transportation;
- The long-term viability of the gas tax, and what might replace it;
- The future of federal and state highway trust funds;
- The roles of transportation agencies in adapting to—and helping to mitigate—climate change and the generation of greenhouse gases;
- The transportation philosophies and policies of a new administration and Congress;
- The provisions and scope of new federal authorizations for surface transportation and aviation; and
- The content of the economic stimulus bill and the potential enactment of a national carbon cap-and-trade law to curb greenhouse gas emissions.

These and other uncertainties are affecting all transportation modes and disciplines. What is certain, however, is that the transportation community is forging ahead—despite these obstacles—with new ideas, programs, and policies to improve customer services. The 2008 TRB field visits witnessed this determination firsthand.



Massive fluctuations in fuel prices were a major source of uncertainty for decision makers, planners, and the general public.

Institutional Issues

Policy, Management, and Leadership

Chronic funding shortages, combined with the economic downturn, presented state DOTs and other transportation organizations with some of the biggest budget challenges in decades. High gas prices in the first half of the year, along with a deepening recession, drove down gasoline consumption and gas tax revenue. Congress passed an $8 billion relief measure to infuse the Highway Trust Fund with additional money to support current programs.

As receipts from property and sales taxes dropped, along with housing prices and consumer spending, many states scaled back their budgets for transportation capital and maintenance programs. Many states are experimenting with innovative funding mechanisms, including public–private partnerships, tolling, and high-occupancy toll lanes.

Personnel is another limited resource. With the first wave of baby boomers retiring, many state DOTs must focus on training to develop and enhance the skills and knowledge of the retirees' successors.

Harvard University selected Virginia DOT's knowledge management program as one of the Top 15 Innovators of 2008, from 1,000 candidates. The Virginia Transportation Research Council administers the program, which has created 40 communities of practice—subject-matter experts who assemble from throughout the department to discuss key

Members of the National Surface Transportation Policy and Revenue Study Commission brief the TRB Executive Committee in January 2008 on the report, *Transportation for Tomorrow*, identifying alternative funding sources; (*left to right:*) Tom Skanke, Steve Heminger, Jack Schenendorf, Frank Busalacchi, Rick Geddes, and the late Paul Weyrich.

transportation issues. This multidisciplinary approach draws from a spectrum of engineers, planners, and administrators to consider topics selected by staff—such as techniques for managing megaprojects or ways to enhance safety measures. The special program has involved hundreds of staff members and has served to break down stovepipes—or isolated working groups—and to increase collaboration within the organization.

The Alaska Department of Transportation and Public Facilities and the Tribal Technical Assistance Program are establishing a Roads Scholar Program, modeled after a program created and developed by Kansas DOT in 2000. The Alaska program provides training to build tribal technical, supervisory, and executive capacity, skills, and knowledge for road inventories, construction management, and project management.

To attract young engineers, planners, maintenance workers, and skilled laborers to the field of transportation, the University of Connecticut's Transportation Institute coordinates an annual transportation design challenge. Aimed at students in minority groups that are underrepresented in the field of transportation, the program integrates math, science, and social studies in trade-oriented activities, such as welding and making toolboxes. The Connecticut Construction Career Days attracted the participation of approximately 1,200 high school students in 16 state districts.

The University Transportation Center for Alabama, in conjunction with the University of Alabama and the Alabama DOT Personnel Bureau, cosponsored an Advanced Transportation Institute to introduce junior and senior high school students—particularly those from groups traditionally underrepresented in the engineering disciplines—to transportation careers. The agenda for the week-long program included presentations on topics such as transportation careers, selecting and gaining admission to a university, and obtaining scholarships.

Planning

At the January 2008 TRB Annual Meeting, the National Surface Transportation Policy and Revenue Study Commission released its report, *Transportation for Tomorrow*, outlining a dire financial outlook and the looming failure of the Highway Trust Fund. The commissioners and the experts who commented on the report identified alternative funding sources and methods to close the gap—but some of the sources, such as public–private partnerships, may require revisions to the planning process. With unknown levels of funding, unknown sources of funds, and the potential for revisions in the planning process, transportation planning must proceed in an atmosphere of uncertainty.

PHOTO: CONNECTICUT CONSTRUCTION INDUSTRIES ASSOCIATION/SWEENEY ADVERTISING, LLC

Students test out one of the many hands-on activities on the program at Connecticut Construction Career Day.

The fuel price roller coaster of 2008 created hardships and difficult trade-offs for many—those with low incomes, those who had chosen farther locations when fuel prices were low, and businesses that rely on reasonable transportation costs. For the planning community, the uncertainty created by the fuel price fluctuations indicated the importance of alternatives to the single-occupant vehicle, as well as the lack of alternatives in most communities. Also made evident was the difficulty of planning if even the most fundamental assumptions—such as fuel prices—are suspect. The planning community will continue to develop methods to prepare for alternative futures and to optimize transportation investments for the range of alternatives.

Legal Issues

The environment, contracting, and funding—including compliance with federal funding regulations—have dominated the legal issues for transportation organizations.

In environmental law, the pressing issues involve rapid changes in the scientific and public policy standards for energy, climate change, and the siting of facilities. The National Environmental Policy Act requires that new information about environmental conditions be taken into consideration. The challenge is the level of environmental consideration and mitigation that will be required in association with climate change and with changes in the standards for protecting wetlands, wildlife, and forests during the planning and siting of projects.

Other issues include the uncertainty in the Disadvantaged Business Enterprise Program after the court of appeals decision in the case brought by

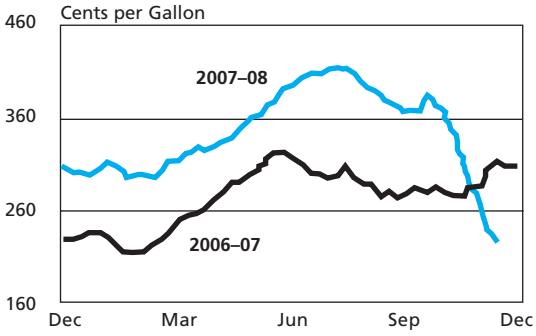


FIGURE 1 U.S. regular gasoline prices, 2006–2007 and 2007–2008. (Source: Energy Information Administration, http://tonto.eia.doe.gov/oog/info/gdu/gasdiesel.asp.)

Western States Paving Company, Inc., against Washington State DOT; ethics in governmental contracting and project development; privacy issues related to electronic communications; and innovative financing. For example, to raise needed cash, more than 30 transit agencies entered into tax-advantaged lease transactions with private investors. Because of the downgrade of transactional sureties, equity investors can declare the transit agencies to be in default, a substantial liability in the midst of the economic downturn.

Regulations for transportation agencies that use federal funds for rail, transit, bus rapid transit, and Americans with Disabilities Act paratransit service have been revised significantly, including the regulations for federal third-party contracting, charter buses, and school buses. Transit agencies must change their policies and practices to comply.

Energy

Economists and the travel forecasting community recognize the relationship between fuel prices and travel behavior, including the number of miles driven, the use of transit, and purchasing decisions about vehicles. Historically, increases in fuel costs have been small and gradual, however, and have not greatly affected the traveling public. Most travel forecasts and economic projections therefore include fuel costs as a minor component. Yet the question, "What would happen if gas prices hit $4 per gallon?" always was lurking, and in 2008, when the prices reached $4, the short-term effects became evident.

The dramatic changes in fuel prices experienced by drivers in 2008 are shown in Figure 1 (left). According to Federal Highway Administration data, vehicle miles traveled in the United States were 9.6 billion lower in May 2008 than in May 2007—a 3.7 percent decline. That was the third-largest monthly drop in the 66 years that the data have been recorded (see Figure 2, below). The downward trend predated the increase in fuel costs but was exacerbated by the increase.

The increases in gas prices contributed to increases in transit ridership. In the second quarter of 2008, public transportation ridership increased by 5.2 percent, with Americans making more than 2.8 billion transit trips. According to a September 2008 survey by the American Public Transportation Association, 85 percent of public transit systems were operating at capacity, with crowded rail cars and buses.

Fuel prices and the general economic downturn also affected vehicle purchasing patterns, with annual sales of large vehicles—trucks, vans, SUVs, and crossover utility vehicles—falling below automobile sales for the first time since 2001 (Figure 3, page 7). Large vehicles comprised 47 percent of the light-duty vehicle sales in April and moved up to 50.48 percent in September.

These were short-term responses to higher fuel prices. How travelers would adjust if the prices remained above $4 per gallon for a longer period of time remains speculation.

With gasoline prices fluctuating, the exploration of renewable and alternative sources of energy has gained emphasis. Connecticut DOT's transit agency has been testing a hybrid hydrogen fuel cell bus—one of only six in the United States—and has acquired practical experience and knowledge of fuel

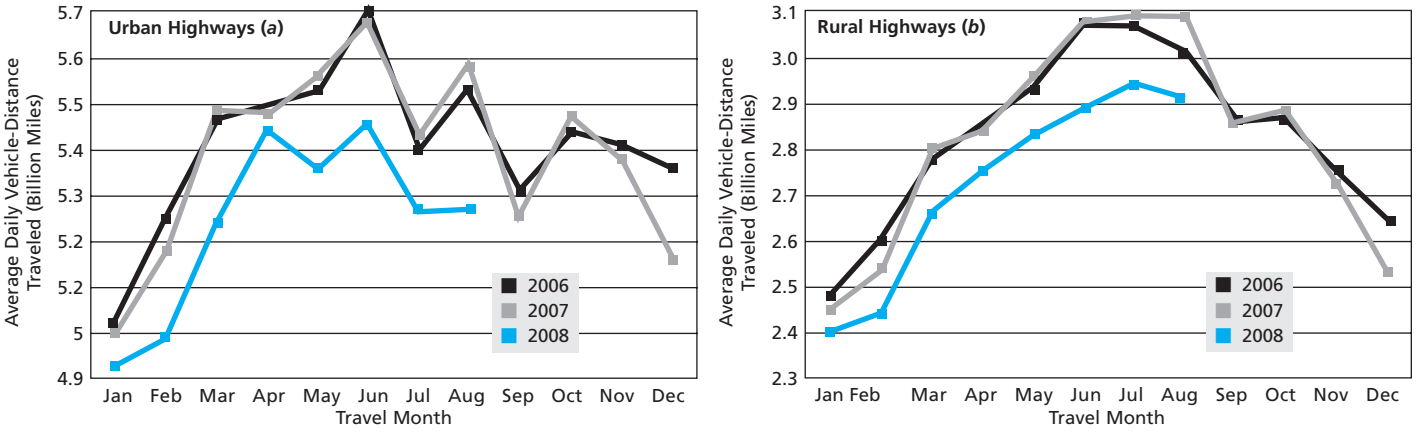


FIGURE 2 Travel on U.S. highways by month, January 2006–August 2008: (*a*) urban highways; (*b*) rural highways. (Source: Federal Highway Administration, Office of Highway Policy Information, www.fhwa.dot.gov/ohim/tvtw/08augtvt/fig2.cfm.)

cell technology. Because hydrogen buses cost the same as diesel buses to operate, the technology may provide a viable option with low carbon emissions.

Alaska has approved construction of a natural gas pipeline from its North Slope to southern Alberta, Canada. The largest-ever public works project in North America will feature spur lines to Anchorage and Valdez. The Alaska legislature has licensed TransCanada for the project and has committed $500 million in funding. Construction is slated to begin in 2018; Alaska DOT is upgrading highway infrastructure to support the project.

Intertwined with the energy issues is climate change. State, regional, and local transportation agencies are exploring their roles in mitigating and adapting to climate change in the absence of a national policy. In California, a court ruling for the first time delayed a high-occupancy vehicle lane project, scheduled for U.S. Route 50, until an environmental impact report could determine the project's effect on greenhouse gas emissions. In addition, Congress soon may pass a national carbon cap-and-trade law, which would set limits on the quantity of greenhouse gases that a region can emit each year and would allow companies to swap permits to emit greenhouse gases.

Environment

Water quality issues were a focus for state DOTs in 2008, including total maximum daily load levels for storm water runoff, as well as treatment options to reduce levels of pollution. Federal, state, and public interests have affected progress on state construction projects, as environmental impact statements have required more concerted mitigation efforts. As a result, states are funding research to identify pavements—such as porous asphalt and porous concrete—and roadway erosion controls that can reduce pollution from storm water runoff.

Another challenge for states is the satisfactory mitigation of the environmental impacts of large construction projects that extend for miles—such as highways. For example, highway construction may affect an impaired watershed at one point, but not throughout the whole extent of the project. Because no procedures are available yet for identifying the impact that a road project or a portion of a road project may have on an already impaired watershed, states are encountering difficulties in developing economically viable mitigation plans to satisfy the environmental regulations.

Other environmental issues for states include air quality conformity; the Section 106 process of the National Historic Preservation Act and community involvement—particularly when a listing in the National Register of Historic Places differs from what a community regards as culturally significant; the protection of endangered species; restrictions to prevent the spread of invasive plant species; the reburial of historical or archeological areas at construction sites; and wildlife crossings and underpasses.

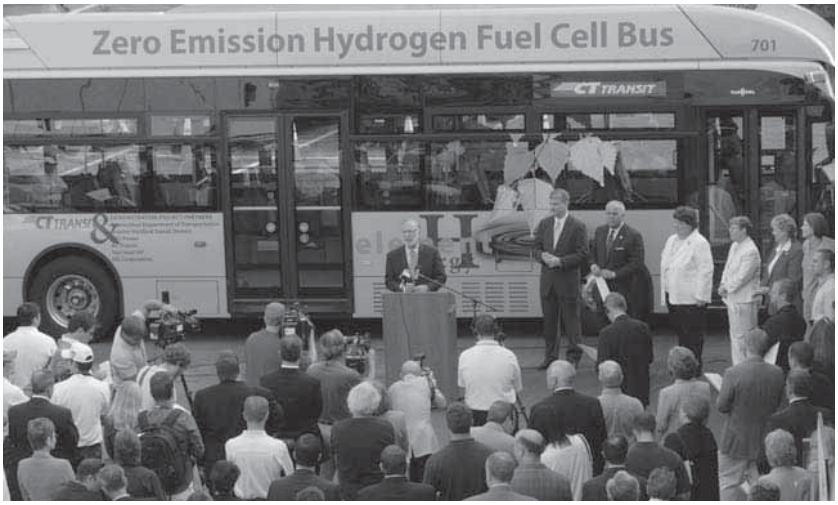


PHOTO: JEFF CRANDALL, CONNECTICUT CENTER FOR ADVANCED TECHNOLOGY, INC.

Connecticut officials answer media questions during the August 2008 state tour of CT Transit's hydrogen fuel cell bus.

Infrastructure Preservation

Preservation involves the timing of actions to extend the useful life of pavement infrastructure while minimizing the costs of ownership. This differs from the traditional approach of addressing assets on a worst-first basis. According to one state DOT, the approach results in "project actions that are much lighter than those [previously] selected—more than 70 percent of the individual project actions are preventive maintenance, [and] rehabilitation projects are fewer and lighter."

State DOT staff have identified the following characteristics of preservation programs:

- Commitment from top management and the state legislature;
- Systems to measure the condition of the network features, such as pavement and bridge management systems;

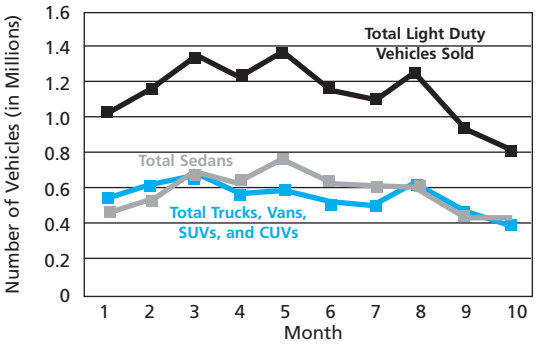


FIGURE 3 Light-duty vehicles purchased in the United States, 2008.

PHOTO: ERIK STUART, UNIVERSITY OF CENTRAL FLORIDA

Pervious pavements under testing at the Stormwater Management Academy Research and Testing (SMART) lab at the University of Central Florida: pervious concrete, Flexipave, and permeable pavers or bricks. Tests include the infiltration rate at which water flows down through the pavements, as well as water quality testing and maintenance of the pavements.

- Means of setting program goals;
- Repeatable means of estimating the benefits of actions to the infrastructure features;
- Dedicated funding and few restrictive rules or requirements, accommodating many different actions, instead of holding to one action for all situations;
- Champions working throughout the organization; and
- A basic understanding of the ways in which the benefits of preservation actions change as the features of the infrastructure age.

Preservation efforts are evolving as DOTs implement programs:

- Integrating network management systems, such as for bridges and pavements, into an enterprisewide, asset management approach that supports the application of limited funds to a variety of projects and activities based on benefit or life-cycle cost; and
- Analyzing assets through their entire life cycle, to identify the reconstruction, rehabilitation, and preservation solutions that have the lowest life-cycle cost.

Data and Information Technologies

State transportation data programs are coping with increases in the complexity of decisions and with reductions in resources. Considerations about air quality, greenhouse gases, and climate change now have greater influence on decision making. As a result, decision makers are looking for these nontraditional data in forms that can be integrated into traditional transportation decision making.

In California, data programs on goods movement now involve cooperative efforts by the DOT and the Air Resources Board. Traditional systems for collecting vehicle miles traveled now must satisfy more requirements for timeliness and offer more flexible geographic resolution, because these data have become critical input for environmental quality models, as well as for gas tax forecasting.

With constraints on resources, states continue to work with metropolitan planning organizations (MPOs) and local governments to share data for common objectives. Displaying information in geographic context with readily available tools such as Google Earth also offers promise.

Freight transportation data are growing in importance for understanding the interaction of the transportation system and the economy. The traditional core federal data set—such as the Commodity Flow Survey and the Freight Analysis Framework—continue to provide the national context for corridor-,

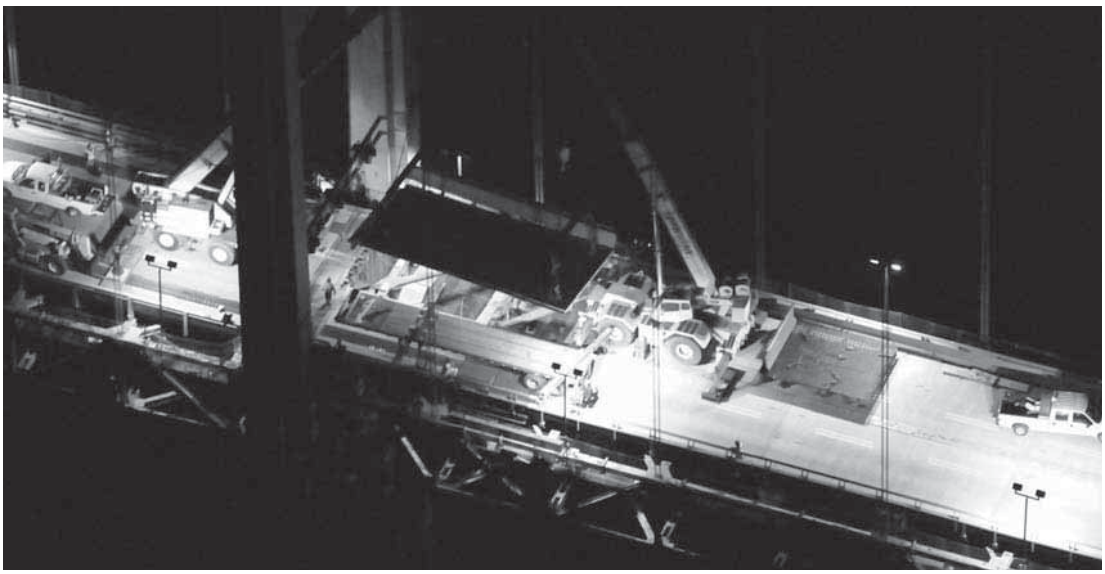
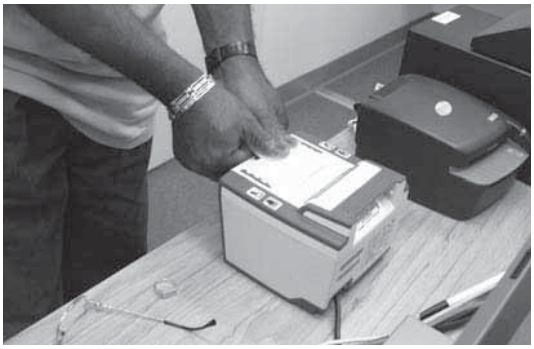


PHOTO: MARYLAND TRANSPORTATION AUTHORITY

As part of the preservation project for the Bay Bridge over the Chesapeake Bay in Maryland, large sections of the concrete roadway are replaced with new prefabricated deck panels. The project also includes replacing sections of the span's steel railing, spot structural painting, and other preservation-related work.



A worker in the Port of Miami applies a thumbprint for the Transportation Worker Identity Credential.

state-, and metropolitan-level analyses.

In responding to global influences, economic volatility, and the need for understanding the interrelationships between freight and climate change, states are exploring methods and approaches that can yield more timely data, provide estimates for smaller geographic areas, and relate vehicle flows with cargo. Building on successful examples, states are exploring general approaches and protocols for agreements with private entities for access to private data essential for public planning.

Critical Infrastructure Protection and Security

The mobile X-ray inspection of trucks entering O'Hare International Airport, Chicago, Illinois, was part of a drill involving federal and city agencies preparing for the 2010 deadline for screening all cargo loaded on passenger planes. The Transportation Security Administration is looking to tighten security of hazardous materials transportation and is soliciting contractors for the Hazardous Materials Endorsement Threat Assessment Program.

Determining the appropriate level of screening for international container cargo—and paying for the measures—continues to be a challenge for states and for the nation's ports. The Transportation Worker Identification Credential program continues to encounter technical problems, objections from unions, and shifts of deadlines, so that many truckers and port workers are without the federal identification required for their jobs.

States along the U.S.–Canadian border are challenged with reconciling the demands for national security with rural economies. Montana, for example, recognizes the need for increased 24-hour cross-border port-of-entry operations but also must reckon with the associated costs. A recent report by the Government Accountability Office highlighted security weaknesses along the northern border, and the U.S. Senate passed a $3 billion amendment to border security funding for hiring new agents and examining technology to improve the patrolling of the border.

Border patrol agents in Vermont, Washington, New York, and other states have increased surprise inspections on domestic trains, buses, and ferries within 100 miles of the borders to intercept illegal immigrants. To protect interior regions of the country, the Department of Homeland Security has launched the Securing the Cities initiative, which includes the testing of fixed and mobile radiation detection systems for commercial trucks on the nation's highways.

Aviation

The volatile economies worldwide and the resulting shifts in fuel prices in 2008 dramatically altered the aviation landscape. Airlines slashed schedules to keep costs in check, affecting revenues and services at airports throughout the United States. Many businesses went into bankruptcy, including several in the emerging markets for very light jets and air taxis.

The federal government is determining how to fund aviation system infrastructure needs in its pending reauthorization plans. Significant concerns remain about the ability to cover future needs with revenues from fuel taxes, user fees, and other charges; moreover, the effect of the volatile economic climate on the federal plans is uncertain.

Many airports are struggling to accommodate the fluctuations in operations and the resulting budget reductions with diminishing staff. Other issues for airports and state DOTs include wildlife collisions with aircraft; climate change mitigation; the fate of the Essential Air Service program; potential closings of publicly available airports; and ongoing research into the Next-Generation Air Transportation System.

Emerging aviation markets, such as air taxis, faced setbacks with the economic downturn.

PHOTO: CALTRANS

Many states are working to bridge the gaps between the public and private sectors and across jurisdictional lines on freight issues and policies.

Freight Systems

Freight transportation demand derives from economic activity. When economic activity is high, large volumes of goods move nationally and internationally. In recent years, large volumes and rapid growth have strained system capacity, and the result was bottlenecks for all modes. Private carriers and public agencies focused on identifying bottlenecks and planning capacity improvements, respectively, but the availability of financing was the overriding concern.

Since the financial and real estate crises, freight volumes have plunged. In the short term, capacity pressures have been relieved, but declines in revenue are disrupting all modes—trucking companies are going out of business, ocean carriers are laying up ships, the work force faces cutbacks, and infrastructure improvements are being delayed. The length of the recession, the impacts on employment and revenues, the effects of volatile fuel prices, and long-term structural changes in economic activity remain uncertain.

Freight is no longer exclusively in the private domain, but the roles of state DOTs and MPOs are not clear. As one state official has observed, "as a profession, freight is in its infancy, and it is hard for government to keep up with the trends and data."

Bridging the gaps between the public and private sectors and across jurisdictional lines remains a challenge. Missouri has hired staff with freight backgrounds; Colorado has projected a roadmap of strategic issues for freight; and Wyoming and Washington have developed data and methods to measure the economic impacts of weather-related closures of major highway freight corridors. In sum, freight transportation faces continual changes in short-term and long-term planning and investments.

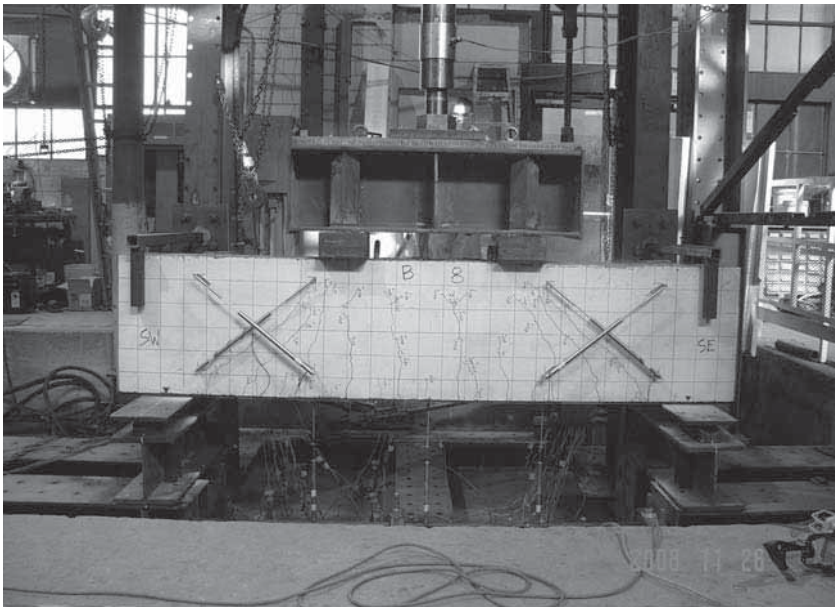


PHOTO: CHRIS P. PANTELIDES, UNIVERSITY OF UTAH

The University of Utah Structures Laboratory is conducting research for the Utah Department of Transportation on reinforced concrete and prestressed concrete girders, simulating corrosion-related deterioration and damage from collision with passing vehicles. The findings will be used to develop design guidelines for a fiber-reinforced polymer composite repair and retrofit of damaged prestressed concrete girders.

Highways

Design

As revenues diminish and the infrastructure ages, state DOTs face unprecedented challenges in designing and managing the repair, rehabilitation, and replacement of the nation's highways and bridges. Pavement and bridge management systems, along with asset management principles, are informing the selection of critical projects as states work to meet the challenges.

In 2008, the Rebuild Pennsylvania program dedicated $350 million to speed the repair of 411 structurally deficient bridges statewide. Many other states—such as Missouri—have identified bridges that need repair, rehabilitation, and replacement and are moving forward with financing and project selection.

To keep pace with the demand and to use limited funds as effectively and efficiently as possible, bridge, bridge deck, and pavement sections are being designed for accelerated construction. Several conferences nationwide have focused on accelerated bridge construction (ABC); demonstration projects and design guides have been completed, and more are in process.

The advantages of ABC include a reduction in total construction costs through time savings in fabrication, as well as congestion mitigation and site safety. Precast concrete elements and sometimes entire bridges can be produced offsite or adjacent to

the site and then quickly placed. Several states—including California, Washington, and South Carolina—are studying and implementing best practices for seismic ABC connections. Similar efforts are under way for durable precast bridge decks.

Highway Construction and Materials

Because of funding problems, the construction of capital improvement projects is a challenge for most state DOTs. Most projects that are put up for contract bids focus on infrastructure renewal, congestion relief, and safety improvements.

Because much of this work is being done on existing facilities, nighttime construction has become the norm in urban areas, as well as in some of the more rural states, raising concerns about noise, as well as safety, quality, and productivity. Some states are concerned about a decrease in construction quality because of a diminishing trained work force. A few states are looking into high-technology solutions, such as intelligent compaction for hot-mix asphalt, which allows real-time quality control of asphalt density testing; or automated machine guidance, which links design software with construction equipment.

Concerned about the environment and sustainability, many state DOTs are accepting more recycled and nontraditional materials for projects if the materials meet performance standards and are cost-competitive. Crushed portland cement concrete is being used as base material, and the percentage of recycled asphalt pavement (RAP) is being increased in hot-mix asphalt. Research conducted under a National Cooperative Highway Research Program (NCHRP) project soon will provide states with a mix design and analysis procedure for increasing RAP in hot-mix asphalts. A few states allow hot or cold in-place recycling of asphalt pavements, the subject of an ongoing NCHRP synthesis. This past year, more states have tried warm-mix asphalt to reduce odors and emissions from asphalt operations. At many agencies, construction noise mitigation remains a concern.

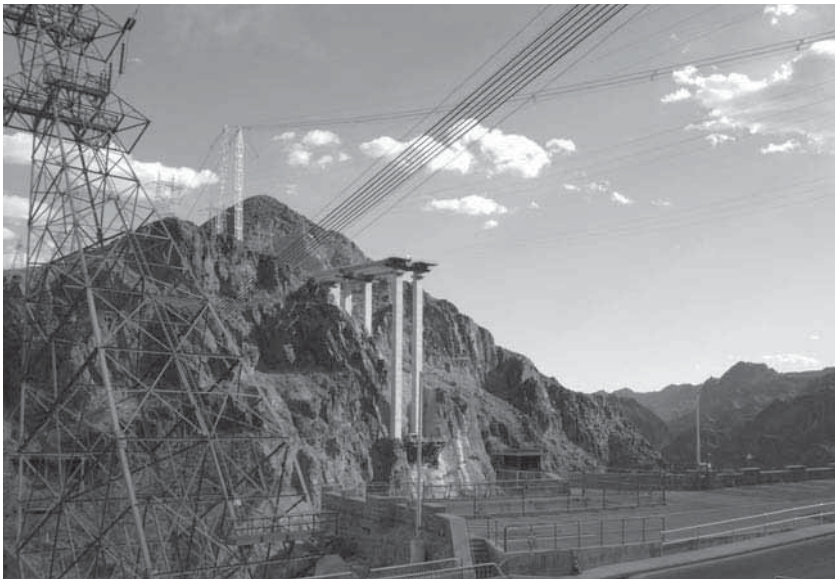


PHOTO: STEPHEN MAHER

Progress on the construction of the Colorado River Bridge, the central portion of the Hoover Dam Bypass Project, as of March 2008, showing the start of the 1,060-foot twin-rib concrete arch. Completion of the entire project is expected in June 2010.

Geotechnical Engineering

In 2008, geotechnical engineering professionals were busy with issues such as landslides, rock falls, subsurface drainage, characterization of aggregates, investigation of structural foundations, and soil stabilization. The most noteworthy topics in geotechnical engineering, however, were intelligent compaction, the load and resistance factor design (LRFD) of structural foundations, and the geotechnical aspects of design–build contracting.

Advances in intelligent compaction have allowed

PHOTO: FHWA AND TRANSTEC GROUP

Field demonstration of intelligent compaction of asphalt, conducted by Minnesota DOT for the FHWA pooled-fund study.

the continuous collection of soil properties with vibratory rollers during earthwork construction; this has enhanced interest in performance-based quality assurance. At the national and state levels, NCHRP Project 21-09, Intelligent Soil Compaction Systems, is under way; FHWA is conducting a pooled-fund study with 13 states on Accelerated Implementation of Intelligent Compaction Technology for Embankment Subgrade Soils, Aggregate Base, and Asphalt Pavement Material; Minnesota DOT introduced a pilot specification in 2008; and a workshop on intelligent compaction was held in April 2008 in Iowa.

October 1, 2007, was the date set by FHWA and AASHTO for the transition to LRFD for the foundations of all substructures of federally funded bridges. The status of LRFD implementation for geotechnical purposes varies from state to state. At a 2008 TRB Annual Meeting workshop, several states presented their experiences in implementing LRFD for geotechnical and substructure design.

Increased use of the design–build approach has raised concerns about incorporating geotechnical procedures. Several states are documenting their experiences, as well as developing standard procedures.

Highway Operations

Highway congestion is a daily occurrence in all large metropolitan areas of the United States. Congestion is a constant source of frustration for drivers and of productivity losses that affect the nation's economy.

State DOTs are increasing efforts to operate and maintain the transportation network more efficiently. Managing demand and optimizing the operation of the system are cost-effective solutions to reduce delays and improve travel-time reliability.

To manage travel demand, many state DOTs have turned to solutions that involve pricing and motorist information. Pricing solutions include high-occupancy toll lanes, variable pricing, and other managed-lane measures. Motorist information services include pretrip traveler information via the Internet, text messages, and 511 telephone connections.

Transportation agencies are working to improve and optimize the management and operations of the road system. Much of the focus has been on technology-based intelligent transportation systems, including closed circuit TV, electronic toll collection, collision warning systems, the Global Positioning System, dynamic message signs, and vehicle–infrastructure cooperation. Other management and operations solutions include incident response, mitigating the impacts of severe weather incidents, improved work zone traffic control and management, more efficient traffic signal control, and improved freeway traffic management, such as ramp metering, variable speed limits, and lane-use management.

In sum, state DOTs are working to improve systems management and operations to reduce delays, improve travel-time reliability, and improve safety.

Highway Safety

Highway fatalities declined in 2007, with the exception of motorcycle fatalities, which rose for the 10th year in a row, by 12 percent.

All states have completed and are implementing

TRIMARC is an intelligent transportation system designed to improve the performance of the freeway system in the metropolitan Louisville and Southern Indiana area. It includes an integrated system of sensors, cameras, dynamic message signs, highway advisory radio, and computers monitoring more than 60 miles of highway traffic.

A follow-on study shows that the Missouri Smooth Roads Initiative has benefited highway safety. Completed ahead of schedule in December 2006—an occasion marked by Missouri DOT Director Pete Rahn (*left*)—the program implemented smoother pavement, brighter striping, rumble strips, and other safety improvements on heavily traveled highways.

Strategic Highway Safety Plans (SHSPs). Two states, Missouri and Michigan, have completed updates of their SHSPs, setting new priorities after meeting some of the goals in their initial plans.

Because traffic crashes declined in 2008 as traffic volumes decreased significantly, questions arose about the respective contributions of safety programs and traffic volume changes. Evaluations completed before the large declines in traffic volume indicate that some safety programs were effective.

For example, Missouri performed a cost–benefit evaluation of the striping and delineation programs that were part of its Smooth Roads Initiative. The goal of the initiative was to improve the rideability and the visibility of more than 2,300 miles of major roadways in the state, including the Interstate system, freeways, expressways, and some multilane and two-lane undivided roads. Reductions in fatalities and injuries from crashes ranged from 11 percent to 86 percent, and each $1 invested in improving the striping and delineation produced benefits averaging $9.70—a range of $5 to $129.

This systemic approach to roadway safety differs greatly from remediation at specific high-crash locations. The systemic approach may be useful for states that have addressed most of their high-crash locations but strive for continued reductions in roadway deaths and injuries.

Ports and Waterways

Despite the current economic challenges, major projects are under way or planned for ports and waterways around the country. On the Great Lakes, the Port of Toledo, Ohio, has received a $5 million grant from the Ohio Department of Development to dredge for port expansion along the Maumee River and to pay for landside infrastructure improvements, which will make the Port of Toledo the largest on the Great Lakes. A proposal to build a new $3 million facility has positioned the Port of Oswego, New York, to become one of the first major container shipping ports on the Great Lakes. Containers offloaded at Oswego would move by rail or truck to their destinations.

On the East Coast, Virginia International Terminals in Newport News has entered into a 10-year, $500 million agreement to provide terminal space to a consortium of five shipping lines; the port is expected to grow substantially in the next few years. The Georgia Ports Authority operates the Port of Savannah, one of the fastest-growing container ports in the country, and is planning more expansion, with four new super post-Panamax cranes installed in 2008 and four more scheduled for delivery in 2009. Other plans include deepening the harbor and expanding the rail yards. South Carolina is developing distribution centers and industrial space to connect the Port of Charleston with the I-26 corridor.

On the West Coast, Pacific Northwest ports have experienced significant increases in grain traffic—particularly wheat, corn, and soybeans—in response to overseas demand for U.S. grains after drought and poor weather conditions in other areas of the world. The growth in export markets has caused inland congestion on railroads, highways, and rivers.

California ports are upgrading landside access—roads, rail, and bridges—and are working to reduce emissions from port operations. The PierPass Off-Peak program, in operation at the Ports of Los Angeles and Long Beach since 2005, has diverted more than 9 million truck trips from peak daytime traffic, reducing congestion and pollution.

Although ports along the Gulf Coast are recover-

PHOTO: JOEDY CAMBRIDGE

The Port of Mobile, Alabama, opened a new container terminal, equipped with cranes capable of handling the larger container ships that will be transiting the expanded Panama Canal.

ing from the hurricane disasters of this and previous years, the region is gearing up for increases in traffic volumes from the expansion of the Panama Canal, which will enable more and larger vessels to travel all-water routes from Asia to the eastern United States. Gulfport, Mississippi, has approved a $1 billion project to rebuild its hurricane-damaged port and expand it with a seaward extension from the cargo-handling facilities. The Port of Mobile, Alabama, recently opened a new container terminal, equipped with cranes capable of handling the larger containerships that will be transiting the expanded Panama Canal. The Port of New Orleans continues to recover and rebuild facilities and trade.

Because Texas coastal ports are not deep enough to accommodate the largest oil tankers, and the refineries are expanding, a Texas partnership has submitted plans to build and operate a $2 billion offshore terminal east of Freeport. The project will include two floating connections for supertankers to unload crude oil and 160 miles of pipeline to deliver the oil to land and along the coast to refineries in the Houston area.

On the inland waterways, ports along the Mississippi River, the McClellan-Kerr Arkansas River Navigation System, and the Tennessee-Tombigbee Waterway also anticipate opportunities from the expansion of the Panama Canal. Officials in Arkansas are considering creation of an authority to develop a container barge terminal.

Rail

Rail transportation made headlines as high fuel prices spurred increased use of public transportation, pushing commuter and intercity passenger rail ridership to record levels. With fuel costs volatile, it is unclear how much of the shift in ridership is permanent. Concerns about greenhouse gas emissions have directed attention to the fuel-efficiency advantages of freight rail. Toward the end of the year, however, freight volumes trended downward as the economic situation worsened. Issues that dominated the rail scene earlier in the year—such as capacity and the sharing of facilities by freight and passenger operations—became less urgent. In the longer term, however, these issues will demand attention.

Fourteen states support rail passenger services contracted with Amtrak. In addition, many states

PHOTO: TULSA PORT OF CATOOSA

A barge moves containers at the Tulsa (Oklahoma) Port of Catoosa, on the McClellan-Kerr Arkansas River Navigation System. The port's river flow levels are controlled by the U.S. Army Corps of Engineers. Inland waterways are expecting opportunities with the expansion of the Panama Canal.

invest to improve the quality of passenger service. For example, the Missouri legislature approved $5 million for capital improvements to the St. Louis–Kansas City freight route to increase the reliability of state-supported Amtrak trains.

Many states assist rail freight operations that contribute to economic development and to the creation and retention of jobs. For example, Wisconsin provided almost $17 million in loans and grants for freight rail projects in 2008.

Landmark federal legislation enacted late in the year authorizes appropriations for U.S. DOT's railroad safety and passenger rail activities and for Amtrak through fiscal year 2013; creates many new rail programs; and revises statutory provisions related to railroad safety and passenger rail activities, including a requirement for the installation of positive train control by 2015 on mainline track used by passenger railroads.

PHOTO: CALTRANS

The fuel-efficiency advantages of freight rail and capacity issues related to sharing facilities with passenger operations are topics that were eclipsed in the past year but will reemerge.

Public Transportation

By normal standards, 2008 was an impressive year for public transportation. Ridership continued to grow, new equipment and services were added, bus and rail systems expanded, and environmentally friendly and energy-efficient technologies advanced. Then petroleum and gasoline costs doubled and dropped, and the transit world changed, with peak-hour service at full capacity and with limited access to credit markets and liquidity.

Transit operators are asking the U.S. Treasury for assistance under the Guarantee Program for Troubled Assets, part of the Emergency Economic Security Act of 2008. In many capital equipment lease-back transactions made before 2004, creditors can attempt to collect immediately because of a technicality in the contract—if the insurance company's credit rating is downgraded, long-term notes can be called in. Under the provisions of the sale-in, lease-

PHOTO: LORIE A. BEABES

Segments of the Euclid Corridor Bus Rapid Transit facility in Cleveland opened in October.

PHOTO: TOM CALLOW, CITY OF PHOENIX

A vehicle prepares to break through the inaugural banner at the grand opening of the Metro Light Rail in Phoenix, Arizona, December 2008.

out and lease-in, lease-out transactions, 25 agencies in 18 states would have to pay $4 billion, forcing deep cuts in service.

Nonetheless, transit fared well in the November 4 elections, gaining $75 billion in new state and local funds—31 of 32 measures passed, including large financial support in Los Angeles County and the Puget Sound region of Washington State, as well as for high-speed rail in California and for commuter rail in Honolulu and Rhode Island. New York City, Chicago, and Washington, D.C., however, are considering fare increases.

New service openings included the Euclid Corridor bus rapid transit in Cleveland and commuter rail in Utah, New Mexico, and North San Diego County. Environmental and energy experiments involving green facilities, biodiesel, hydrogen, and natural gas started up.

Two large-scale projects are making progress: the New Jersey Transit Corporation is studying construction of a third tunnel under the Hudson River, including two single-track tunnels, expansion of Pennsylvania Station, and direct links to three New York City subways and the Port Authority Trans-Hudson lines; and in California, approvals were given for high-speed rail connecting urban areas.

Commitment and Hard Work

Uncertainties in the economy, energy, funding, and national policies made 2008 particularly challenging for transportation agencies. The progress amid rapidly changing conditions testifies to the commitment and hard work of transportation personnel. This dedication can be expected to lead the way through 2009.

Did You Know?

- Juneau, the state capital of Alaska, is not accessible by road—it can only be reached by air or by sea.
- Alaska DOT operates 258 airports throughout the state—the most of any state DOT.
- 82 percent of Alaska's communities depend on air service for medical and food supplies.
- Alaska is more than twice the size of Texas but has fewer road miles than the state of Rhode Island.
- Alaska has more coastline than all of the continental states combined.
- Alaska has the lowest gasoline tax of any state—8 cents per gallon.
- Connecticut DOT is the only DOT with a hybrid hydrogen fuel cell bus. AC Transit in the Bay Area has the five other fuel cell buses in the United States.
- Georgia DOT owns and operates three asphalt plants.
- Pennsylvania DOT supports the transportation needs of 67 counties, 48 of which are rural, with a total of 2,563 municipalities.
- At the Alabama Advanced Transportation Institute for high school students, the most popular event follows a presentation on road safety—the students build safety containers to protect raw eggs dropped from one of Alabama DOT's bucket trucks. Some student designs have successfully protected the eggs on a drop from the full height of the bucket truck—50 feet.

Air travel allows Alaskans to overcome scenic but difficult terrain.

- Many transportation agency maintenance staff have devised inventions to improve productivity and safety, but these innovations often remain untapped resources. Colorado DOT has funded a research project to document and develop compensation for inventions and to obtain patents for individuals or the agency, depending on when and where the inventions were developed.