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INNOVATOR

Accelerating Innovation for the American Driving Experience

Surveys Help DOTs Boost Customer Satisfaction

From "assuring user satisfaction" to "creating customer delight," highway agencies use a variety of terms to describe a key goal of their construction programs: satisfying the desire of motorists for a good driving experience.

One way agencies determine how well they're meeting that goal is with customer surveys. Conducted before, during or after construction, surveys help agencies plan projects, adjust construction and traffic management strategies, and improve success on future projects.

Under the Highways for LIFE program, construction projects receiving funding must include performance goals that define desired results in user satisfaction, in addition to safety, construction congestion and quality goals. It's part of the focus of the Federal Highway Administration program to accelerate the use of innovation.

A look at surveys conducted for three projects receiving Highways for LIFE grants shows how they improved the planning and construction process and provided useful information about customer satisfaction.

Surveying on Full Road Closure

The Minnesota Department of Transportation did a survey before starting its project to rebuild part of Highway 36 in North St. Paul. The February 2006 telephone survey asked respondents to choose between two construction scenarios: closing the highway completely for five months or keeping it open with delays and off-peak closures for two years.

Residents and commuters expressed support for both scenarios without indicating a clear preference, while businesses preferred the two-year option. Knowing that equal numbers of people would be happy and unhappy no matter which way the project was done, the Minnesota DOT opted for a full road closure. It lasted four months and allowed the agency to save money, improve safety for motorists and construction workers, and build a higher-quality highway.

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Inside This Issue:

Q&A With Kelly Damron: Transforming a DOT

Kelly Damron, ITS operations engineer for the North Carolina Department of Transportation, is a member of the agency's Transformation Management Team and manages its outreach effort. A former Federal Highway Administration engineer, she has worked with state DOTs around the country. Damron spoke with Innovator *about the team's initiative to help the North Carolina DOT transform the way it does business.*

Why did you decide to launch a Transformation process?

We use the term "perfect storm." Our demand is increasing significantly, with the state's vehicle miles traveled expected to double by 2030. Our cost of business is rising, with an 80 percent increase in construction costs since 2002. And the funds available for transportation are decreasing as our state gas tax revenues decline. With all of these challenges facing us, there was no way we could continue to do business as usual.

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HIGHWAYS FOR LIFE
Accelerating Innovation for the American Driving Experience.

What's the goal of the process?

Our goal is to look ahead at the 21st century transportation needs of the state and be sure that we are a department that can deliver on those needs. Our secondary goal is to leverage the great DOT that we are by ensuring we're focused on the right things.

We are a very good DOT. I've worked with six others, so I can say that. But we have some things to fix. As individual employees, we're doing what we think is best, but we have to make sure we're all working on the right things in the right way.

What steps are involved?

We began in spring 2007 with McKinsey & Company surveying our employees and partners to determine strengths, weaknesses and opportunities to improve. In summer 2007, 20 DOT employees were assigned full time to the Transformation Team to design and implement the process. Two of our 14 division engineers are on the project, as well as a deputy division engineer, the head of one of our preconstruction units, the director of accounting—some high-level people. Roberto Canales, our deputy secretary for transit, is guiding us as project manager.

Some key DOT leaders conceived this effort, and we spend five hours each week working with them, which is a significant commitment of their time. We vet with them what the Transformation Team has been working on and get their guidance and approval before we go forth with implementation.

Our key emphasis areas are strategic direction, planning and prioritization, program and project efficiencies, performance accountability and talent management. Most of the design is complete and we're now beginning implementation and integration, especially transferring ownership of new practices to others in the DOT to sustain.

The Transformation Team is scheduled to roll off in fall 2008. But we've created an ongoing strategic planning process so we can take a look at ourselves periodically and ask "Have our goals changed? What should transportation look like in North Carolina?"

What are you focusing on to make the process a success?

We're focused on results—not just outputs but outcomes. Getting people to think this way is a culture change for us. We began by creating a mission and five goals that drive our day-to-day business. Our mission is to "connect people and places in North Carolina—safely and efficiently, with accountability and environmental sensitivity."

Our goals are to make our network safer, make our network move people and goods more efficiently, make our infrastructure last longer, be a place that works well and be a great place to work. We designed our goals to be simple, concise and clear to all of our 14,000 employees.

From there we've created metrics, our term for performance measures, for 150 leaders that state our expectations for them and quantify how the group they manage should contribute to these goals. The beauty of this is that almost all of our key metrics are shared between many of our top 150.

How will the agency be different after its transformation?

Prioritization and accountability are big parts of Transformation. We are now able to focus better on what is important by knowing what we are held accountable for. Just having the conversations to determine our metrics was a wonderful exercise.

Employee development is also key to our success. The survey told us we were not adequately recruiting, retaining or developing our staff. We've made many significant improvements in areas such as hiring, career planning, leadership development, performance management, compensation, alternative work schedules, etc.

One of the best things we did was acknowledge that these things are important to us. It's not just about asphalt, concrete and traffic cameras. It's about devoting resources to developing our employees so they have the skills and abilities to do the work of the department.

What advice would you offer colleagues in other states considering a similar effort?

Do your best to get your employees on board as early and thoroughly as you can. From midlevel managers to frontline employees, it's easy to be resistant to what you don't understand. Doing this is harder than it sounds, but when you do it well you truly see the value of having buy-in from the folks who are affected.

Pick people who are thought leaders in their areas to be part of the team. They have earned the respect of their peers and have credibility going in. Make this a full-time job for folks. It's too hard and too important to put this kind of thing into the mix of an already-full plate.

Think about how you will institutionalize it once you have transformed. Lots of people have seen attempts at meaningful change come and go. You have to think through not only how you will change, but also how you will ensure that these changes will stick. Our metrics are key to this, but we've even talked about a "Transformation Team Alumni Club" as an accountability partner for our organization, a way that we can check back in every so often and say, "Hey, whatever happened to our plan to . . ."

For more information on the North Carolina DOT's Transformation, visit www.ncdot.org/programs/dashboard.

"Best Solutions" Workshop Resonates in North Carolina

A recent Federal Highway Administration "Seeking the Best Solutions" workshop was timely for the North Carolina Department of Transportation, which has launched a results-focused program it calls "Transformation."

Through the Transformation program, designed to help the agency meet the state's 21st century transportation needs, the DOT is developing measurable performance goals in areas such as safety, traffic congestion and longer-lasting infrastructure.

The "Best Solutions" workshop, the third in FHWA's Highways for LIFE program, is designed to instill the HfL philosophy of setting motorist-focused stretch goals, identifying and using innovative practices and technologies to meet these goals, and communicating with customers. About 40 people attended the workshop, including representatives from the North Carolina DOT and FHWA's North Carolina Division.

"In a lot of ways, the workshop has reinforced that things we're looking at in Transformation are the right things," said North Carolina DOT ITS Operations Engineer Kelly Damron. "Expectation management, really, is what I took away from HfL. It was also a wonderful opportunity for us to take another 10 or 15 NCDOT staff people who may not be familiar with Transformation and bring them into the fold."

Especially valuable in the workshop, Damron said, was the focus on making sure that performance goals are specific, measurable, achievable, results-oriented and timely (SMART) and clarify responsibility.

"One of the big areas we are focusing on in Transformation is shared metrics," she said. "Crash rates are one example. There are about 150 managers in this department that set the direction for the organization, and we are putting crash rates or some similar safety-related indicator on most of their metrics. It really helps us to see more clearly how we all have to work together to accomplish our goals."

Innovative Project

In two half-day sessions, workshop participants applied performance goals and brainstormed innovations on a pending North Carolina DOT project in the town of Huntersville. The project will improve 1.25 miles (2 kilometers) of two-lane NC 73 by widening it to a four-lane, median-divided facility.

One benefit of the workshop was establishing points of contact with fellow attendees from a variety of disciplines, according to DOT Assistant State Alternative Delivery Engineer Jimmy Travis.

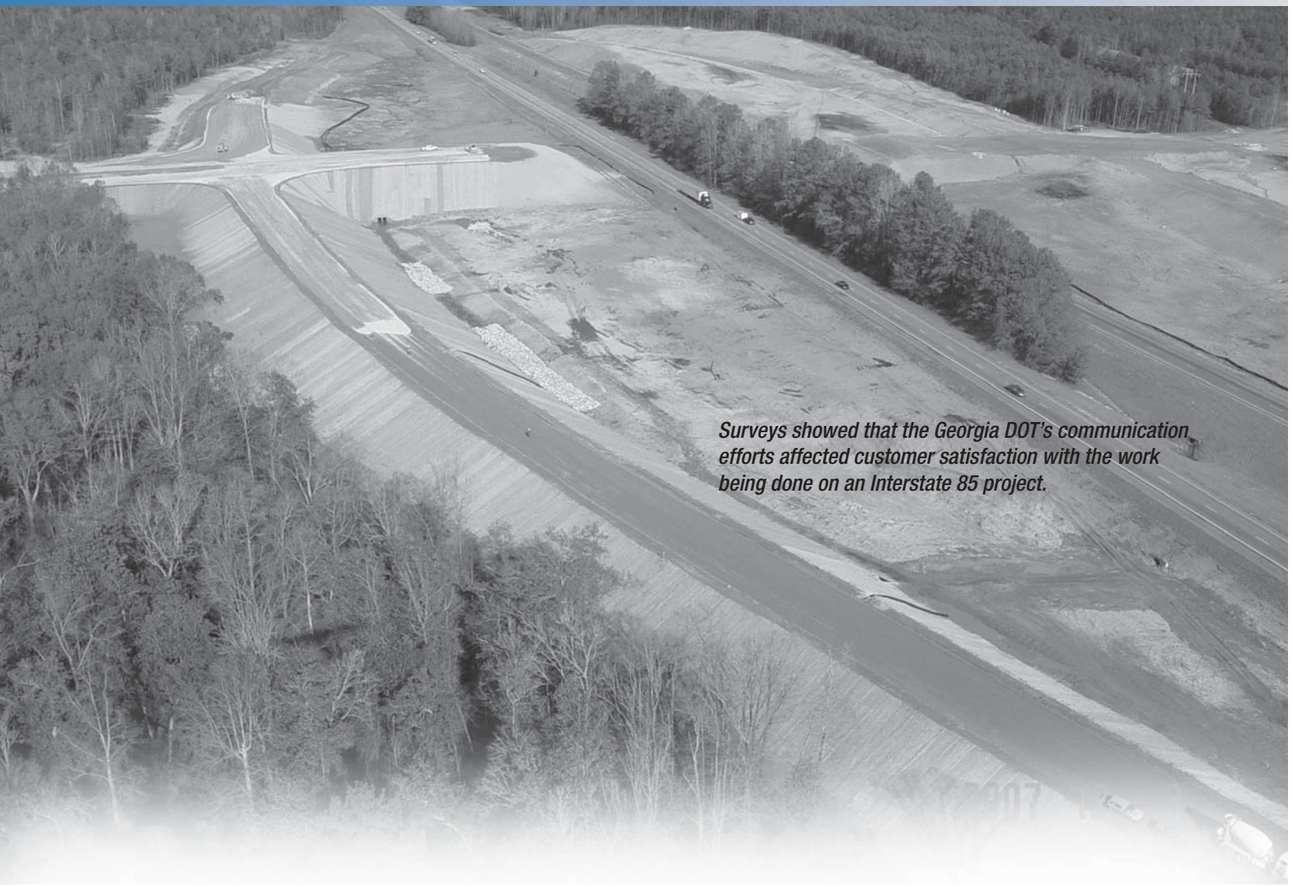
"But more, on a program level it allowed us to look at how to set those goals and recognize the true important outcomes we need to have from the project. It allowed us to build on the goals and innovations that were brainstormed and prioritized in the workshop and which are going to continue as the project develops," Travis said. "When we walk away from the workshop, we have a working document that we can move forward on and translate to other projects."

One feature of the project is a public-public partnership between the North Carolina DOT and Huntersville. Financial support from the town has made it possible for the state to start construction on the $16 million project as much as four years earlier than programmed.

Using the design-build contracting method, the North Carolina DOT projects that the design and construction, scheduled to start this summer, will take 700 to 750 days, versus an estimated 1,100 days for a more conventional design-bid-build approach.

Other states that have held "Seeking the Best Solutions" workshops include West Virginia, Texas, South Dakota, Massachusetts and Arkansas. Workshops are planned in Nevada, Wisconsin and Indiana.

To schedule a workshop, contact Mary Huie at (202) 366-3039 or mary.huie@dot.gov. For more information on North Carolina's Transformation program, see "Q&A with Kelly Damron: Transforming a DOT" in this issue.



Surveys showed that the Georgia DOT's communication efforts affected customer satisfaction with the work being done on an Interstate 85 project.

"Because full closure is such a departure from how we normally construct highways, our management wanted to ensure the public was behind this idea," said Chris Roy, Minnesota DOT design engineer. "With the survey results being nearly 50-50, we felt the timing was right to try something new."

The agency is conducting a post-construction survey to determine customer satisfaction with the full-closure experience. Because each community is unique, the agency may survey affected populations before using the full-closure technique on future projects.

The Minnesota DOT has been conducting customer surveys since the mid-1980s, said Chris McMahon, the agency's market research director. Not only does it build trust with the public, she said, it also reduces the risk that future decisions might be too costly or poorly received by the public.

"Satisfaction measurement is also a critical part of our overall performance management, particularly in the area of maintenance services," McMahon said. "We want our end users to know that we care about doing a good job, getting their input and striving to do better."

Addressing Customer Concerns

When the Georgia DOT hired a contractor to build an interchange on Interstate 85 near LaGrange, one requirement was that the contractor conduct user satisfaction surveys at the quarter points of the project.

"Evaluating customer satisfaction is one way the Georgia DOT can assess whether an effort meets our standards for quality and safety and helps further our mission to provide a safe, seamless and sustainable transportation system that supports Georgia's economy and is sensitive to its citizens and the environment," said Greg Wiggins, Georgia DOT senior engineer and design group manager.

The agency set a goal that 80 percent of those surveyed be somewhat to very satisfied with the job being done. The first survey was conducted in December 2007 by telephone when the project was 25 percent complete. The results showed that 65 percent of respondents who expressed an opinion were somewhat to very satisfied, while 35 percent were somewhat to very dissatisfied.

The survey also found that respondents who had received information on the project were more satisfied. Almost one in two respondents who received a postcard was somewhat to very satisfied, compared to one in three who did not receive the mailer.

"The survey results indicated that communication efforts are influencing how satisfied respondents are with current construction efforts," said Wiggins.

To increase the customer satisfaction level, the agency implemented additional communication activities, including updating messages on the project hotline and mailing postcards to residents on upcoming lane closures and construction work, installing portable message boards in the project area and distributing a news release.

Results of the second survey indicate that those efforts paid off. Among those with an opinion, 73 percent were somewhat satisfied or better. "If we can duplicate these results on the next survey, we will exceed our 80 percent goal," said Brandy McDow of ARCADIS, the project design firm.

Measuring Post-Job Satisfaction

When the Utah DOT replaced the 4500 South Bridge over Interstate 215 in Salt Lake City, it minimized traffic disruption by removing the old bridge deck and replacing it with a new superstructure in one weekend. The superstructure was built at a nearby staging area and moved into place with self-propelled modular transporters. Besides reducing construction time, the use of prefabrication and innovative transporter technology was designed to produce a smoother, longer-lasting bridge.

The agency mailed out a post-construction survey in December 2007 to develop findings that could be used to improve future Utah DOT construction projects and relationships with stakeholders in the construction area.

Respondents were asked to rate their satisfaction level in several areas:

- Nearly 92 percent said they were satisfied or very satisfied with the Utah DOT's and the contractor's overall performance during the project.
- About 94 percent were satisfied or very satisfied with the results of the project.
- About 79 percent were satisfied or very satisfied with the ways the Utah DOT provided information about the project.

When asked to rank the materials and methods used to keep customers informed about the project, respondents gave the highest ratings to the Utah DOT Web site, road signs, direct mail, highway advisory radio and flyers. Least effective, according to those surveyed, were e-mail updates.

"We were surprised at the preferred methods of communication," said Evelyn Tuddenham, public involvement coordinator for the Utah DOT. "Generally, stakeholders prefer e-mail updates and hand-delivered flyers. Because of this project's high profile and curiosity over the bridge being built next to the freeway, stakeholders went to our Web site and checked on the highway advisory radio for information. It's an example of how different each project is."

For more information on the Highways for LIFE projects in Minnesota, Georgia and Utah, see the October 2007, December 2007 and April 2008 issues of Innovator at www.fhwa.dot.gov/hfl/innovator.

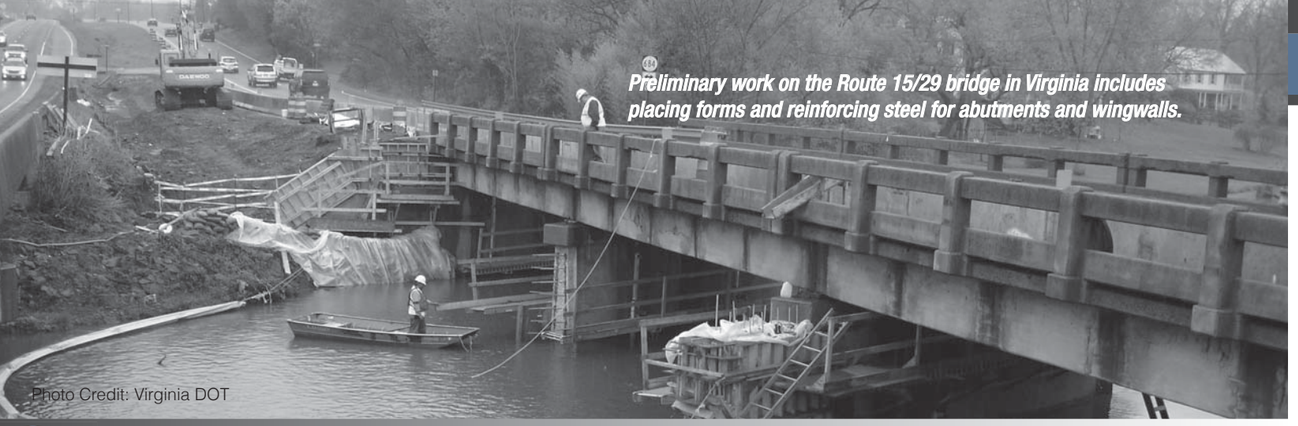
SPMTs Topic of NHI Seminar

The use of self-propelled modular transporters to build bridges faster and with higher quality is the topic of a National Highway Institute Web conference at 1 p.m. on June 26.

Industry experts will discuss bridge reconstruction projects involving SPMTs, computer-controlled platform vehicles that can move bridge systems with precision.

The Web conference is part of the NHI "Real Solutions" seminar series. The free monthly sessions, one-and-a-half hours each, feature experts from highway agencies and industry talking about how real-life tools and strategies are being used to improve the planning, construction and operation of the nation's highway system. Each presentation is followed by a question-and-answer session.

To register for the June 26 seminar, go to www.nhi.fhwa.dot.gov/resources/webconference/web_conf_learner_reg.aspx?webConfID=14039.



Preliminary work on the Route 15/29 bridge in Virginia includes placing forms and reinforcing steel for abutments and wingwalls.

Photo Credit: Virginia DOT

Virginia Projects Use Rapid Replacement to Slash Construction Time, Congestion

Innovative construction techniques and technologies being piloted on two Highways for LIFE projects in northern Virginia are expected to increase roadway and bridge life spans and dramatically reduce construction times.

Constructing prefabricated elements offsite and assembling them onsite during off-peak traffic periods is a technique that slashes traffic disruption times for the two projects in these urbanized, high-traffic areas. One project is an interstate access ramp in Fairfax County; the other is a bridge replacement in Prince William County.

On the bridge carrying two lanes of Route 15/29 southbound over Broad Run in Prince William County, the deteriorated concrete T beam superstructure, built in 1952, is being replaced by a steel girder/concrete deck structure. The replaced bridge will include 12 of these new structures, prefabricated offsite and laid four abreast in three spans, one in each of 12 nights.

The method allows the bridge replacement to take just 12 days versus some 100 days for conventional construction. It also allows the project to maintain a minimum of one open traffic lane at night and meet the morning rush hour with both lanes in full operation.

By reducing construction time and traffic congestion, the rapid replacement is also expected to reduce worker injuries, the potential for crashes and highway user cost in trip times.

Among the project's other features are lightweight, high-performance concrete; self-consolidating concrete in some applications; corrosion-resistant reinforcing steel; high-performance grout; waterproof membrane with asphalt concrete overlay for waterproofing and a smooth ride; and jointless abutments.

The project's estimated $2.9 million cost is being financed with a Highways for LIFE waive match. What would normally be Virginia's 20 percent share of the cost is actually financed with federal funds.

Preliminary work began in fall 2007, with replacement of the superstructure scheduled for summer and project completion anticipated in fall 2008.

Precast Pavement Systems

Use of precast concrete pavement systems will provide similar values of faster, more durable construction and reduced traffic impact in replacing the distressed pavement slabs of a 40-year-old ramp from Interstate 66 to US 50 in Fairfax County.

With a $1 million Highways for LIFE grant and construction scheduled for summer 2009, the $5 million project will evaluate two precast concrete pavement technologies, along with conventional cast-in-place construction:

- Precast, presetressed, post-tensioned slabs on mainline I-66 westbound adjacent to the ramp
- Precast slabs with integral load transfer dowels on some areas of the ramp
- Standard cast-in-place, high-early-strength concrete patches on remaining areas of the ramp

Piloting these technologies is expected to provide comparative data on construction, performance and costs.

"If this technology proves how rapidly it can be installed, minimizing disruption to the public, and if we also get long-term durability—40 years or more—then we have a significant benefit," said Claude Napier, bridge engineer with the Federal Highway Administration's Virginia Division.

Conventional repair with construction staging and curing of cast-in-place concrete would require 100 or more days with traffic congestion from lane closures. The precast-slab approach, by contrast, should allow closure of just one lane at a time during 35 nights of work, with full traffic flow during the day.

For more information, contact Claude Napier at (804) 775-3363 or claude.napier@dot.gov.

Precast Concrete Pavement Systems Speed Construction

Precast concrete pavement panels like those being used to renovate an interstate ramp on a Virginia Highways for LIFE project are new tools in the pavement engineer's toolkit with the potential to revolutionize highway repair.

Cast offsite and installed in a short time span when traffic volume is low, precast concrete pavement panels reduce traffic congestion and offer several advantages over traditional cast-in-place construction in high-traffic areas:

- The panels make the construction process safer and more efficient because roadwork can be completed during off-peak hours, reducing the need for roadway closures.
- Because they are precast, panels can be fabricated under environmentally controlled conditions with higher quality control standards, resulting in more durable pavements.
- The construction season can be extended because prefabrication takes place under environmental controls.
- The panels can be made thinner than cast-in-place panels, making them ideal for installation under overpasses with limited height clearances.

In precast concrete pavement system construction, adjacent panels are assembled sequentially and tied together onsite through either post-tensioning or cast-in-load transfer systems. Two systems—one proprietary and one nonproprietary—are available.

The nonproprietary precast, prestressed concrete pavement system is the result of Federal Highway Administration research aimed at strengthening concrete panels by prestressing them, a technique used on cast-in-place concrete construction for decades. The proprietary system is a jointed precast slab assembly with a unique load transfer mechanism that uses dowels placed in dovetailed receiving pockets that are grouted after installation.

Numerous projects using precast concrete panels have been completed in the United States. They include FHWA-sponsored pilot projects using precast, prestressed concrete pavement technology on Interstate 35 in Georgetown, Texas; I-10 in El Monte, Calif.; I-57 near Sikeston, Mo.; and Highway 60 near Sheldon, Iowa. Prestressed slabs were post-tensioned onsite in all projects.

The precast jointed pavement system has been used on more than 20 projects, including the Tappan Zee Bridge toll plaza in New York, several segments of the New York Thruway, the Illinois Tollway and Route 7 in Schenectady, N.Y.

To expand the use of precast concrete pavement systems technology, FHWA's Highways for LIFE program has designated it as one of its "vanguard" technologies that it promotes through rapid deployment strategies. It is also one of the focus technologies that the American Association of State Highway and Transportation Officials' Technology Implementation Group is promoting through a "lead state team" effort.

Highways for LIFE and AASHTO TIG cosponsored a May videoconference on precast pavement systems and are now developing a marketing plan to broadly implement the technology.

For more information on precast pavement technology, visit Highways for LIFE at www.fhwa.dot.gov/hfl and AASHTO TIG at tig.transportation.org/?siteid=57&pageid=1826. To view the videoconference, go to www.washto-x.org.

Precast concrete pavement systems speed work and cut congestion on repair jobs in high-traffic areas.

CALENDAR

Seventh International Conference on Managing Pavement Assets, June 24–28, 2008, Calgary, Canada. Go to www.icmpa2008.com.

Fourth International Conference on Bridge Maintenance, Safety and Management, July 13–17, 2008, Seoul, Korea. Information at www.iabmas08.org.

2008 Petersen Asphalt Research Conference, July 14–16, 2008, Laramie, Wyo. Visit www.petersenasphaltconference.org.

National LTAP/TTAP Conference, July 14–17, 2008, Breckinridge, Colo. Go to ltap.colorado.edu/conferences/national.

Maryland-South Carolina-Virginia Highways for LIFE Demonstration Project Showcase on prefabricated bridge elements, July 22, 2008, Frederick, Md. For more information, contact Mary Huie at (202) 366-3039 or mary.huie@dot.gov.

2008 International Orthotropic Bridge Conference, Aug. 25–29, 2008, Sacramento, Calif. Go to www.orthotropic-bridge.org.

First International Conference on Transportation Construction Management, Sept. 9–11, 2008, Orlando, Fla. Information at www.2008tcmconference.volpe.dot.gov.

National Workshop on Highway Asset Inventory and Data Collection, Sept. 24–26, 2008, Durham, N.C. Visit www.itre.ncsu.edu/ncassetmgmtconf/index.html.

Precast/Prestressed Concrete Institute–FHWA National Bridge Conference, Oct. 5–8, 2008, Orlando, Fla. Information at www.pci.org/news/bridge_conference.

INNOVATOR

Innovator, published by the FHWA Highways for LIFE program, advances implementation of innovative technologies and processes in the highway industry. Its audience is transportation professionals in highway agencies, trade and research groups, academia and the private sector, and the driving public.

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