

FOCUS

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Efficient, Expeditious, and Effective: Best Practices in Project Delivery Management

Traveling the country in 2009 in search of Best Practices in Project Delivery Management, a domestic scan team sponsored by the American Association of State Highway and Transportation Officials (AASHTO), Federal Highway Administration (FHWA), and National Cooperative Highway Research Program (NCHRP) found an array of innovative best practices that are changing the way transportation agencies do business. As agencies work to deliver projects in a high-demand environment, while facing increased congestion, reduced periods of time when construction can be accomplished, and budget pressures, the best practices identified by the scan team are allowing States to complete work more efficiently and expeditiously. "The many diverse practices observed offer valuable lessons in project management and delivery," says scan team member Connie Yew of FHWA.

From February 22–March 3, 2009, the scan team visited the Arizona, Florida, Missouri, Utah, Virginia, and Washington State departments of transportation, as well as the City of Phoenix. Scan team members included representatives from FHWA and State transportation agencies. The team focused on four areas:

- Project management.
- Performance measures.
- Innovative contracting practices.
- Community involvement activities.

In the project management area, the team looked at project management structure,

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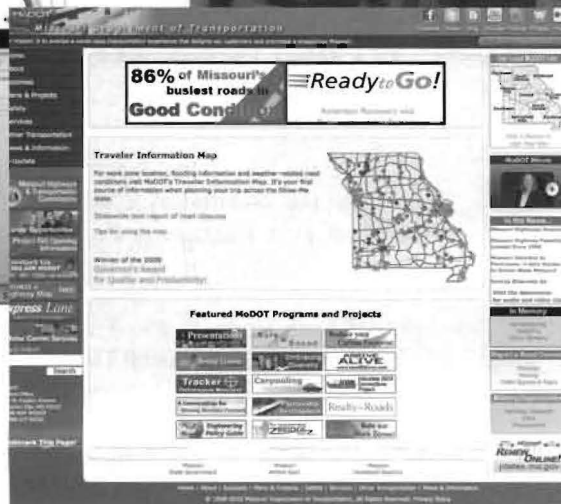


The scan team visited the New I-64 project in St. Louis, MO. The project reconstructed and upgraded the roadway, interchanges, and bridges on I-64.



Concrete is poured for the New I-64 project in St. Louis, MO.

Best Practices in Project Delivery, continued from page 1



Left: The Virginia Department of Transportation features a dashboard on its Web site (dashboard.virginiadot.org/default.aspx) to provide information on project status.

Middle: The Missouri Department of Transportation issues a quarterly Tracker report on project performance. To learn more, visit www.modot.mo.gov.

Above: Scan team members traveled to AZ, FL, MO, UT, VA, and WA.

shared leadership, risk management, use of consultants, investment in geographic information system (GIS) and data management tools for project delivery, and maintenance of core competencies. All of the agencies visited made extensive use of a project management structure, with the best systems composed of cohesive, multi-disciplinary teams that communicate well among themselves. Leaders at all levels of the organization were key to the successful deployment of best practices.

Best practices relating to risk management include the Washington State Department of Transportation's (WSDOT) Cost Estimate Validation Process, which has helped WSDOT identify and measure risks and manage project costs. The City of Phoenix, meanwhile, uses the Construction Manager at Risk (CMAR) system to mitigate and manage risk. Under this system, the contractor offers a guaranteed

maximum price for the project work. Phoenix has used CMAR for \$3 billion worth of projects, resulting in only one claim to date.

Use of consultants in the project management process ranged from 20 percent to more than 80 percent. Those States with a high level of consultant use also have defined evaluation procedures to assess the consultants' performance and their suitability for future work. As consultant use has grown, however, a decline in the core competencies of State staff is of continuing concern to the agencies visited.

GIS and data management tools are key to enhancing the effectiveness of project management. The Florida Department of Transportation's (FDOT) Efficient Transportation Decision Making (ETDM) program, for example, has enabled the agency to take a tremendous step forward in improving the concurrent project review

process and communication between FDOT and stakeholder groups. To learn more, visit etdmpub.flas-etat.org.

All of the agencies visited have implemented some form of a performance management system to measure their work. Following the philosophy of "what gets measured gets done," the Virginia Department of Transportation (VDOT) features a dashboard on its Web site (dashboard.virginiadot.org/default.aspx) to provide current and easily understood information on project status and progress. Missouri, meanwhile, issues a quarterly Tracker report that covers many areas of project performance. The report is available both in printed format and online at www.modot.mo.gov/about/general_info/Tracker.htm.

Innovative contracting practices are also widely used, ranging from the Construction Manager General Contractor

(CMGC) method in Utah to Phoenix's use of CMAR. Benefits of using these methods include fewer project claims, improved relationships with contractors, faster project delivery, better quality, and improved cost control.

In all of the locations visited, community involvement is key to project success. As the scan team report notes, "Community involvement is not a singular moment but an effort from beginning to end." From the planning and conception of a project through construction and beyond, agencies are proactively reaching out and providing information to the public, using everything from flyers, radio spots, and project-specific Web sites to new media such as YouTube™, Facebook®, and Twitter®. WSDOT, for example, not only has 70 Public Information Officers assigned throughout the State, but offers an online toolbox featuring Twitter, YouTube, Flickr®, and podcasts. In Utah and Missouri, major projects receive their own branding and logos as a way of making vital information on the project more visible to the public.

Best practices in community involvement also include working to enhance relationships with outside stakeholders, including State and Federal agencies, utilities, local governments, contractors, and consultants.

The scan team's report, *Best Practices in Project Delivery Management*, is available online at onlinepubs.trb.org/onlinepubs/nchrp/docs/nchrp20-68A_07-01.pdf. The team's implementation plan for sharing the best practices observed in the scan has included holding a series of five Webinars in September 2009. Among other strategies, the team plans to make presentations to associations, industry groups, AASHTO committees, and others this year, as well as to share best practices through online and social media. For more information on the Best Practices in Project Delivery Management Scan, contact Connie Yew at FHWA, 202-366-1078 (email: connie.yew@fhwa.dot.gov). *

Innovations and Real Solutions in 2010

The Federal Highway Administration's (FHWA) National Highway Institute (NHI) will continue its free online Real Solutions and Innovations seminar series in 2010 with a diverse and timely schedule of sessions. The Real Solutions series features guest speakers discussing challenges they have faced in the field and the innovative solutions used to address those challenges. Upcoming seminars include Bridge Life Cycle Benefit and Cost Analysis: Fundamentals and Application on February 25, 2010, from 1–3 p.m. (eastern standard time), and Best Practices for Roadway Tunnel Design, Construction, and Maintenance on March 25, 2010, from 1–3 p.m. (eastern standard time). Past sessions have focused on such topics as Best Practices in Bridge Management Decision-Making, Use of Self-Propelled Modular Transporters (SPMTs) for Ultra-Rapid Bridge Construction, and Troubleshooting Early-Age Cracking of Concrete Pavements.

The Innovation Series is designed to bring representatives from State and local transportation agencies, industry, academia, and others up-to-the-minute information on today's highway technology advances. Hosted in conjunction with FHWA's Highways for LIFE program, past Innovation sessions have included Advancements in EPS (Expanded Polystyrene) Geofoam for Transportation Applications, Best Practices in Accelerated Construction Techniques, Self-Consolidating Concrete, and Bridge Inspection. Upcom-



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The National Highway Institute's Real Solutions and Innovations seminars present the latest information on today's highway technology.

ing seminars include Accelerating Project Delivery and Innovative Contracting on February 24, 2010, from 2:30–4 p.m. (eastern standard time) and The Use of Recycled Materials in Roadway Construction on March 25, 2010, from 2:30–4 p.m. (eastern standard time).

To be notified when registration opens for the upcoming Web seminars, send an email to nhimarketing@dot.gov. To download presentations from previous Real Solutions seminars, visit www.nhi.fhwa.dot.gov/about/realsolutions.aspx. Presentations from the Innovations series are available at www.nhi.fhwa.dot.gov/about/innovationseries.aspx. *

A First-Hand Introduction to Accelerated Bridge Construction

With more State departments of transportation turning to accelerated bridge construction (ABC) strategies and techniques to deliver projects faster and with less inconvenience to motorists, a free ABC workshop available from the Federal Highway Administration's (FHWA) Resource Center Structures Technical Service Team offers agencies a national perspective, expert guidance, and first-hand case studies from States that have successfully implemented ABC. The workshop is also supported by FHWA's Office of Bridge Technology and Highways for LIFE program.

States can choose a 1-, 2-, or 3-day format for the workshop. The 1-day workshop includes information on FHWA's framework for selecting ABC projects, cost comparisons between conventional bridge construction and ABC, equipment such as self-propelled modular transporters that can facilitate the use of accelerated strategies, ABC project design, the FHWA *Connection Details for Prefabricated Bridge Elements and Systems* manual, and innovative contracting methods. Case studies have also been featured from such States as New Hampshire, Rhode Island, Texas, Utah, and Washington.

The longer 2- or 3-day workshop may include all or part of the information from the 1-day session, as well as offering the opportunity for participants to discuss a specific project in the host State and visit the project site. Separate breakout groups look at the design and construction of the project and make recommendations for implementing ABC strategies.

One-day seminars have been held in States such as New York and Rhode Island, while Illinois, Massachusetts, Montana, and Wisconsin are among those that have hosted project-specific workshops. A 2-day workshop held in Montgomery County, Maryland, in September 2009, for example, looked at a planned rehabilitation of

the Cedar Lane Bridge over Rock Creek. Attendees visited the bridge site and then discussed and prioritized recommendations in the areas of construction, innovative contracting, and bridge design.

A structures breakout group provided recommendations on ways to accelerate construction and improve long-term durability, including using:

- Prefabricated construction such as precast pier caps, precast prestressed concrete beam types, precast approach slabs, or prestressed beam approach slabs.
- Construction techniques that minimize traffic impact. This could include employing a road closure strategy that provides a detour.
- Innovative contracting techniques. These could include design/build, incentive/disincentive, or A+B bidding (cost plus time).
- High performance materials such as high performance concrete and corrosion resistant reinforcement steel.
- A corrosion protection strategy for all bridge elements.

Additional recommendations for accelerating construction came from the Construction and Innovative Contracting breakout group, including evaluating demolition concepts and methods for removing the existing bridge.

More than 300 participants have attended the various ABC workshops to date. "The response from participants has been very positive," says Lou Triandafilou of the FHWA Resource Center. "Many workshops have already been requested for 2010." Workshops tentatively planned for this year include ones in Arizona, Minnesota, New Jersey, New York, Oregon, Puerto Rico, and Virginia.

To learn more about scheduling an ABC workshop, contact Claude Napier at the

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Projects that have used accelerated bridge construction include the Virginia Department of Transportation's replacement of the superstructure of a bridge on Route 15/29 in Prince William County. At top is the completed bridge. The bridge's superstructure segments were fabricated off site (bottom).

2010 FHWA Bridge Engineering Conference to Spotlight Accelerated Bridge Construction

More than 150 technical presentations will cover all aspects of bridge construction at the 2010 FHWA Bridge Engineering Conference: Highways for LIFE and Accelerated Bridge Construction. Scheduled for April 8–9, 2010, in Orlando, Florida, the conference is co-sponsored by 19 State departments of transportation. Sessions will cover such topics as prefabricated bridge elements and systems, innovative materials, design for 100-year service life, seismic bridge engineering, nondestructive bridge evaluation methodology and techniques, substructures, and inspection and maintenance. For more information or to register, visit www.2010bridge.com. There is no fee to attend the conference but registration is required. For more information, contact Reggie Holt at FHWA, 202-366-4596 (email: reggie.holt@fhwa.dot.gov).

Telling the R&T Story

From building the bridge of the future to saving lives with cable median barriers to going green to protect the environment, the Federal Highway Administration's (FHWA) continuing commitment to highway research is changing the way roads, bridges, and other highway facilities are designed, built, and maintained across the country. A new FHWA publication, *The Value of Research: Telling the R&T Story* (Pub. No. FHWA-HRT-09-050), spotlights examples of how FHWA research has been translated into groundbreaking technology that is improving the safety, reliability, effectiveness, and sustainability of today's transportation system.

In Ohio, for example, the bridge of the future has arrived. Using geosynthetic reinforced soil (GRS) technology for abutments, revolutionary new bridges are being built using readily available materials and common construction equipment, without the need for highly skilled workers. Instead of a conventional bridge abutment, GRS technology alternates layers of compacted local soil and sheets of geotextile fabric reinforcement to provide support for the bridge. The result is bridges that are both extremely durable and cost effective. Compared to standard bridge construction, transportation agencies can cut their costs by 25 to 50 percent.

Researchers at the U.S. Forest Service and the Colorado Department of Transportation (CDOT) pioneered the development of the technology. FHWA has since worked with CDOT to further refine it, including building and testing several full-scale GRS structures at its Turner-Fairbank Highway Research Center in McLean, Virginia. With initial guidance from FHWA, Defiance County, Ohio, built the Bowman Road Bridge using GRS technology in 2005. The county realized a cost savings of nearly 25 percent and shaved 2 weeks off the con-

struction time for a conventional bridge. Since that first project, Defiance County has built more than 10 bridges using GRS. Other Ohio counties and several States are also now interested in using the technology.

In North Carolina, meanwhile, FHWA has worked with the North Carolina Department of Transportation (NCDOT) to analyze the performance of cable median barriers and look for potential improvements in the technology. Since 1998, NCDOT has installed hundreds of miles of cable median barriers across the State, instead of using the traditional concrete and metal beam barriers. NCDOT estimates that between 1999 and 2005 more than 95 cross-median crashes were prevented, saving more than 145 lives. FHWA and NCDOT researchers applied advanced digital simulation techniques to analyze the dynamics of vehicles as they cross a median and determined that a barrier's performance depends on where it is placed in the median. The research has now been expanded to cover different cable median barriers and a range of median configurations, with the results being used to develop new cable barrier standards in several States and to develop guidelines for incorporation in the American Association of State Highway and Transportation Officials' (AASHTO) *Roadside Design Guide*.

Reducing emissions and minimizing the impact of highway infrastructure on the environment is another significant focus of FHWA's research and technology activities. FHWA and AASHTO's Center for Environmental Excellence (environment.transportation.org) provides a one-stop shop for transportation professionals seeking technical assistance, training, information exchange, partnership-building opportunities, and quick and easy access to environmental tools. Among the center's resources are 13 Practitioner Guides



FHWA and AASHTO's Center for Environmental Excellence (environment.transportation.org) provides quick and easy access to environmental tools.

that provide practical, easy to understand advice on current environmental management issues, including *Developing and Implementing a Stormwater Management Program in a Transportation Agency* and *Responding to Comments on an Environmental Impact Statement*.

Looking to the future, new initiatives are building on FHWA's research legacy. The 20-year Long-Term Bridge Performance Program, for example, is investigating how the United States can manage its bridges better and ensure their safety and durability. The program will inspect, evaluate, and periodically monitor a representative sample of bridges nationwide. For more information, visit www.tfhr.gov/ltbp/index.htm. The Exploratory Advanced Research Program, meanwhile, is focusing on long-term, high-risk research with a high payoff potential. To learn more, visit www.fhwa.dot.gov/advancedresearch.

To download a copy of *Telling the R&T Story*, visit www.tfhr.gov/about/09050/index.htm. For more information on the publication, contact Martha Soneira at FHWA, 202-493-3468 (email: martha.soneira@fhwa.dot.gov). Information on all of FHWA's research and technology initiatives is available at www.tfhr.gov. *

Traffic Maintenance Online Training Courses Debut

Maintenance of Traffic for Technicians (Course No. FHWA-NHI-380098) and Maintenance of Traffic for Supervisors (Course No. FHWA-NHI-380099) are the latest in a series of free online training courses available from the Transportation Curriculum Coordination Council (TCCC), in partnership with the Federal Highway Administration's (FHWA)

National Highway Institute (NHI). The TCCC's members include representatives from FHWA, NHI, regional State training and certification groups, several American Association of State Highway and Transportation Officials subcommittees, and industry associations.

"The new Traffic Maintenance courses are a user-friendly training tool for work site traffic supervisors and technicians or engineers responsible for work zone traffic control. Because they are online, the courses are ideal for those in need of immediate training or information," says Christopher Newman of FHWA.

The self-paced 5-hour courses present information about the placement of, field maintenance required for, and inspection of traffic control devices. The requirements of flagging operations are also covered. Upon completion of Maintenance of Traffic for Technicians, participants will be able to:

- Identify the correct placement of work zone traffic control devices.
- Perform field maintenance of work zone traffic control devices.
- Inspect the placement or operational functions of work zone traffic control devices.
- Generate work zone traffic control plans.
- Understand the basics of flagging.

Maintenance of Traffic for Supervisors, meanwhile, consists of five modules:

1. Fundamental principles of temporary traffic control zones.
2. Temporary traffic control devices.
3. Traffic control zones.
4. Transportation management plans.
5. Flagger operations.

Upon completion of the course, participants will be able to describe how to create clear, organized traffic control plans; identify acceptable temporary traffic control devices; and determine good and bad flagging techniques.

This course and other free Web-based training sessions developed by the TCCC are available for scheduling at any time through the NHI online course catalog (www.nhi.fhwa.dot.gov/training/brows_catalog.aspx). For additional information on the TCCC courses, contact Christopher Newman at FHWA, 202-366-2023 (email: christopher.newman@fhwa.dot.gov). To learn more about the TCCC's many training resources, visit www.nhi.fhwa.dot.gov/tccc. *

"The new Traffic Maintenance courses are a user-friendly training tool for work site traffic supervisors and technicians or engineers responsible for work zone traffic control."



New online training courses developed by the Transportation Curriculum Coordination Council include ones on work zone traffic control.

Highway Technology Calendar

The following events provide opportunities to learn more about products and technologies for accelerating infrastructure innovations.

**2010 Concrete Bridge Conference:
Achieving Safe, Smart, and
Sustainable Bridges**
February 24–26, 2010, Phoenix, AZ

Conference sponsors include the National Concrete Bridge Council and the Portland Cement Association. Key topics to be featured at the conference include sustainable bridges, nondestructive evaluation for bridges, durable bridge decks, smart bridges, and innovative bridge design and construction.

Contact: Reggie Holt at the Federal Highway Administration (FHWA), 202-366-4596 (email: reggie.holt@fhwa.dot.gov), or visit www.nationalconcretebridge.org/cbc.

**2010 FHWA Bridge Engineering
Conference—Highways for LIFE and
Accelerated Bridge Construction**
April 8–9, 2010, Orlando, FL

Conference topics will include prefabricated bridge elements and systems, innovative materials, nondestructive bridge evaluation methodology and techniques, accelerated bridge construction, inspection and maintenance, and seismic bridge engineering. The conference is cosponsored by 19 State departments of transportation.

Contact: Reggie Holt at FHWA, 202-366-4596 (email: reggie.holt@fhwa.dot.gov), or visit www.2010bridge.com.

**First International Conference on
Pavement Preservation**
April 13–15, 2010, Newport Beach, CA

An array of pavement preservation issues will be featured at the conference, including benefits of pavement preservation, treatments for flexible and rigid pavements, strategy selection, integration of pavement preservation into pavement management systems, promotion of pavement preservation to the public and elected officials, and funding.

Contact: Christopher Newman at FHWA, 202-366-2023 (email: christopher.newman@fhwa.dot.gov). For more information, visit www.pavementpreservation.org/icpp.

**2010 Design-Build in Transportation
Conference**
April 21–23, 2010, Dallas, TX

Join transportation leaders in discussing lessons learned in the use of the design-build project delivery method for transportation projects. The discussions will cover choosing the right delivery method, contracting approaches, risk allocation, and performance contracting. The conference is cosponsored by the Design-Build Institute of America, FHWA, American Association of State Highway and Transportation Officials (AASHTO), and various industry groups.

Contact: Jerry Yakowenko at FHWA, 202-366-1562 (email: gerald.yakowenko@fhwa.dot.gov), or visit www.designbuildtransportation.com.

**The Fifth International Conference
on Bridge Maintenance, Safety,
and Management**
July 11–15, 2010, Philadelphia, PA

Organized by the International Association for Bridge Maintenance and Safety, the conference will cover such topics as measurement and monitoring, fatigue analysis, repair and strengthening, bridge testing and assessment, advanced materials technology, and innovative construction technology. Sponsors include AASHTO, FHWA, the Transportation Research Board (TRB), Pennsylvania Infrastructure Technology Alliance, American Concrete Institute, and Lehigh University.

Contact: Ian Friedland at FHWA, 202-493-3023 (email: ian.friedland@fhwa.dot.gov), or visit www.iabmas2010.org.

**International Conference on
Sustainable Concrete Pavements:
Practices, Challenges, and Directions**
September 15–17, 2010, Sacramento, CA

The conference will present innovative processes for achieving sustainable concrete pavements throughout the pavement's life cycle. Topics will include existing technologies, emerging research, approaches to measuring energy and environmental impact, user considerations, and international practices and experiences. Case studies from around the world will also be presented. The conference is being organized by FHWA and the National Concrete Pavement Technology Center as part of the technology transfer efforts of FHWA's Advanced Concrete Pavement Technology Products Program.

Contact: Shiraz Tayabji at Fugro Consultants, Inc., 410-997-9020 (email: stayabji@aol.com); or Sam Tyson at FHWA, 202-366-1326 (email: sam.tyson@fhwa.dot.gov). Information is also available online at www.fhwa.dot.gov/pavement/concrete/2010acptpconf.cfm.

**Seventh International Bridge
Engineering Conference**
December 1–3, 2010, San Antonio, TX

Sponsored by TRB and FHWA and hosted by the Texas Department of Transportation, the conference will focus on improving bridge reliability and safety. Technical sessions will cover such topics as accelerated bridge construction, bridge management and preservation, innovative materials, inspection and monitoring, bridge scour, and seismic and blast hazards.

Contact: Ian Friedland at FHWA, 202-493-3023 (email: ian.friedland@fhwa.dot.gov), or visit www.TRB.org/Conferences/2010/IBEC. *

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Focus (ISSN 1060-6637), which is published monthly by the U.S. Department of Transportation's Federal Highway Administration (FHWA), covers the implementation of innovative technologies in all areas of infrastructure.

Its primary mission is twofold: (1) to serve the providers of highway infrastructure with innovations and support to improve the quality, safety, and service of our roads and bridges; and (2) to help promote and market programs and projects of the various offices of FHWA's Office of Infrastructure.

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for downloading at www.fhwa.dot.gov/bridge/prefab are FHWA's *Framework for Prefabricated Bridge Elements and Systems Decision-Making* (Pub. No. FHWA-IF-06-30) and *Manual on Use of Self-Propelled Modular Transporters to Remove and Replace Bridges* (Pub. No. FHWA-HIF-07-022). To learn more about ABC, visit www.fhwa.dot.gov/bridge/accelerated/index.cfm. For information on FHWA's Accelerated Construction Technology Transfer program, which has worked with States around the country to host project-specific accelerated construction workshops, visit www.fhwa.dot.gov/construction/accelerated. *

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