Accelerating Infrastructure Innovations

FOCUS

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INSIDE

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U.S. Department of Transportation
Federal Highway Administration

Accelerating Innovation Implementation

Whether your goal is to implement an accelerated bridge construction strategy, a road safety audit, or an asset management system, get ready to "leap not creep." A new course introduced this year by the Federal Highway Administration's (FHWA) National Highway Institute (NHI), Leap Not Creep: Accelerating Innovation Implementation (Course No. FHWA-NHI-134073), provides participants with the tools they need to successfully implement innovations and mainstream those innovations so that they become part of their transportation agency's standard practice.

Developed by FHWA's Highways for LIFE program, the 2-day course highlights

- Successful implementation strategies.
- Components of an implementation plan.
- Techniques for marketing an innovation.
- Strategies for handling implementation challenges.
- Avenues for identifying innovations.
- Resources for locating the necessary funding.

The course is designed for a range of highway community representatives who may be involved in implementing an innovation, including project managers, engineers, transportation specialists, analysts, senior managers, and marketing and communications specialists. In addition to the 2 days of instructor-led training, attendees participate in 3 hours of online training prior to the start of the course. The course fee is $350 per participant, with a minimum of 15 attendees and a maximum of 30.

From identifying a need and finding an innovation to meet that need to establishing an implementation plan and team, the course walks participants through the steps to success. An implementation team, for example, needs not only technical experts but marketing staff, financial managers, and stakeholder representatives, among others. As highlighted in the course, the Minnesota Department of Transportation (Mn/DOT) assembled a diverse team to implement the new Maintenance Decision Support System (MDSS)/Automated Vehicle Location (AVL) technology. The MDSS is a computer-based, customizable decision support tool that provides

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Innovations implemented across the country include the Utah Department of Transportation's use of accelerated construction techniques for bridges, such as for this bridge on I-80 in Salt Lake City.

Accelerating Innovation Implementation,

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Seven prefabricated bridges are ready for shipping at the Utah Department of Transportation's "bridge farm."

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Utah's accelerated bridge construction projects include the 4500 South bridge in Salt Lake City. The prefabricated superstructure was installed using self-propelled modular transporters.

winter maintenance personnel with specific weather forecast information and road treatment recommendations. Combined with AVL, the system allows Mn/DOT to more efficiently clear and maintain roads during winter storms. Mn/DOT's implementation of the MDSS/AVL was aided by its creation of four technical development teams, which focused on such issues as mobile equipment and systems information gathering. Each team reported to an overall Strategic Direction Team that included maintenance engineers from all eight of Mn/DOT's district offices. The teams provided an important boost in implementing the new technology.

While the course has no prerequisites, participants should be able to identify an innovation that they would like to implement at their agency. At a session of the course held September 15–16, 2009, at FHWA's Turner-Fairbank Highway Research Center in McLean, Virginia, the list of innovations ranged from the use of higher amounts of fly ash in concrete pavements and structures to implementation of hydraulic simulators that can perform erosion modeling to the use of road safety audits in the design phase of projects. Participants then broke into smaller groups to outline goals and develop implementation plans for their technologies, considering such factors as budget, staffing, scope, target audience, and evaluation measures.

"The course provided the tools to move forward in implementing innovations," says participant Trinette Ballard of FHWA's Florida Division office. "Breaking up into groups to work on implementation plans kept people thinking and engaged. I would definitely recommend the course to others."

"The session presented a very organized approach to accelerating innovations," adds participant Rick Meininger of FHWA's Turner-Fairbank Highway Research Center. "It makes you realize how important it is to have champions for innovations."

Course materials provide recommendations for how to successfully execute an implementation plan, as well as recommendations for managing change within an agency and communicating ideas to both implementation team members and senior management staff. Also featured are information on funding resources and examples of innovations implemented recently at transportation agencies across the country, including roundabouts, intelligent compaction for pavements, and accelerated bridge construction. The Utah Department of Transportation, for example, has determined that starting in 2010, the use of accelerated construction techniques such as prefabricated bridge elements and systems will be its standard approach for bridge construction.

"The most useful part of the course was walking out of there with a draft implementation plan that is ready to go. You also learn from the many diverse innovations that are represented and from what others have accomplished," says Becky Crowe of FHWA's Office of Safety.

For more information or to schedule the course, visit www.nhi.fhwa.dot.gov. For more information on the course content, contact Kathleen Bergeron at FHWA, 202-366-5508 (email: kathleen.bergeron@fhwa.dot.gov). *

Courses Offer Guidance on Designing and Constructing Mechanically Stabilized Earth Technology

Learn how to design and construct mechanically stabilized earth walls (MSEWs) and reinforced soil slopes (RSS) with two courses offered by the Federal Highway Administration's (FHWA) National Highway Institute (NHI).

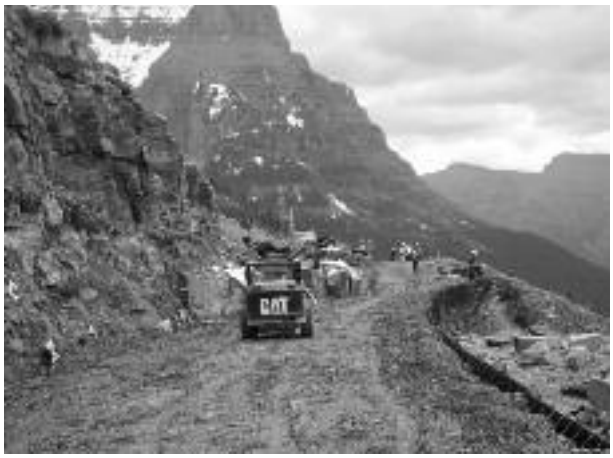
Design of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes (Course No. FHWA-NHI-132042) is a 3-day course aimed at educating participants about state-of-the-practice design tools. The course includes comprehensive instruction on the design of MSEWs and the use of load and resistance factor design. The course also highlights construction practices to use in implementing mechanically stabilized earth technology in cost-effective earth retention structures.

Following course completion, participants will understand potential roadway applications for MSEWs and RSS structures. They will also be equipped to prepare conceptual and basic designs and check contractor-submitted designs for walls and slopes. In addition, participants will be able to examine and select appropriate material properties and parameters used in design, calculate the cost of conceptual MSEWs and RSS structures, and determine if construction is a cost-effective option.

Also available from NHI is Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes (Course No. FHWA-NHI-132043). This new 1-day course provides insight into the concepts of MSEW and RSS systems and their application to roadways. During this course, attendees will receive guidance on the use of construction materials, information on MSEW and RSS system construction steps, and details on typical construction practices and techniques.

Following successful completion of the course, participants will be able to identify potential transportation applications for MSEWs and RSS structures, recognize differences between available systems and their components, and understand the intent of specification and contracting methods. They will also learn about the major components of conducting construction inspections of MSEWs and RSS structures.

To learn more about the two courses, contact Rich Barrows at FHWA, 360-619-7704 (email: rich.barrows@fhwa.dot.gov). To register for either course, visit www.nhi.fhwa.dot.gov. Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes has a registration fee of $220 per participant, while Design of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes costs $420 per participant. *



FHWA's Western Federal Lands Highway Division office constructs a mechanically stabilized earth wall in Montana's Glacier National Park.

Bridge abutment walls in Warm Springs, SD.

A mechanically stabilized earth wall near Deadwood, SD.

Data-Driven Decisionmaking Practices: A Case Study

A new case study recently released by the Federal Highway Administration's (FHWA) Office of Asset Management and Office of Planning offers insight into the use of management systems for transportation planning and programming. *Management Systems: Driving Performance. A Glance at Data-Driven Decisionmaking Practices* (Pub. No. FHWA-HIF-09-021) is the latest publication in FHWA's series of Transportation Asset Management (TAM) case studies.

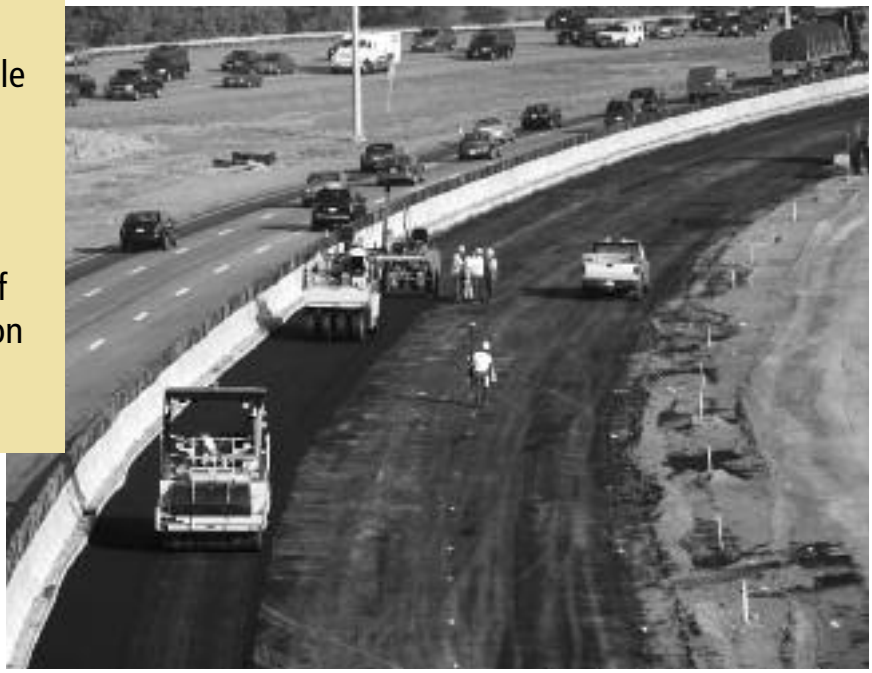
TAM is a strategic and systematic process of allocating resources for the preservation, operation, management, upgrade, and expansion of the Nation's transportation infrastructure. Using TAM and information from management systems, an agency aims to provide the best return for each dollar invested. "With many issues surrounding infrastructure, congestion, and funding, State departments of transportation are often looking for new ways to manage and maintain their transportation assets," says Nastaran Saadatmand of FHWA's Office of Asset Management.

TAM can include initiatives in the areas of pavement and bridge management, network preservation, economics in asset management, life-cycle cost analysis, and highway safety and operations. Analysis of data from management systems is vital to TAM efforts. "Management systems can provide invaluable information for planning, programming, and overall management of the transportation network. This information is essential in transportation decisionmaking to establish realistic agency goals and set investment levels across assets," notes Saadatmand.

The case study highlights management systems being used by six States. The Montana Department of Transportation (MDT), for example, has implemented a Performance Planning Process. This process uses the outputs from MDT's pavement, bridge, and congestion management systems to assess alternative investments and strategies that contribute to system-performance goals. The Vermont Agency of Transportation (VTrans), meanwhile, is one of the few State transportation agencies to have asset management and performance measures written into statute. VTrans has developed a quantifiable project prioritization method that assigns a numeric score to projects listed in the annual budget. These scores help explain why one project is chosen over another.

In New Jersey, a Statewide Capital Investment Strategy is being used to develop investment options for transportation categories based on goals, objectives, and performance measures. It includes transportation investments in common categories across different agencies, rather than developing separate strategies for each agency. This integrated approach allows the public to better understand the total State investment needed for roads, bridges, and public transportation.

> "Management systems can provide invaluable information for planning, programming, and overall management of the transportation network."



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Using transportation asset management and information from management systems, agencies aim to provide the best return for each dollar invested in transportation infrastructure.

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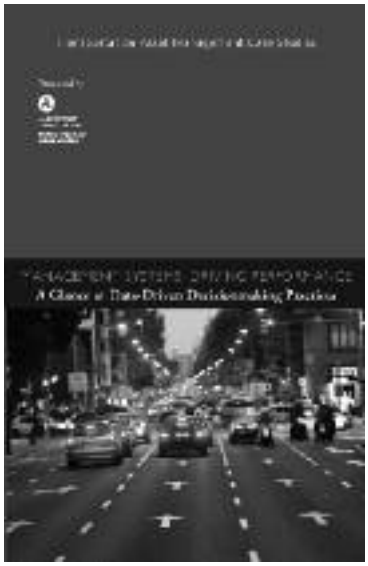


Transportation asset management can include initiatives in such areas as pavement and bridge management and highway safety and operations.

Across the country in Tucson, Arizona, the Pima Association of Governments is developing a transportation improvement program that makes optimum use of available Federal, State, and local funds to serve the region's multimodal transportation needs. Candidate projects are evaluated using such principal criteria as the project's safety benefits, congestion benefits, and volume of use. And in Seattle, Washington, the Puget Sound Regional Council is looking at data-driven approaches for documenting the condition and investment needs of major routes. The council is creating a database that will help decisionmakers understand the magnitude of investment needed to maintain the region's local arterial network.

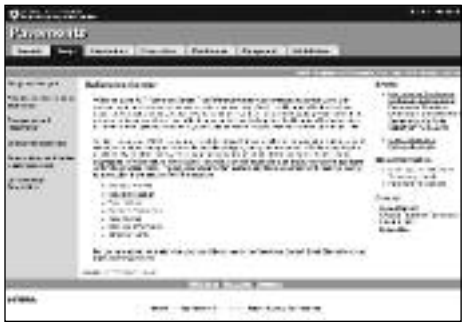
Finally, the case study looks at Albany, New York, and its Capital District Transportation Committee. This metropolitan planning organization uses a performance-based management strategy to maintain the region's transportation infrastructure. The strategy includes painting bridges before they corrode, building long-lasting pavements, and matching treatments to road function.

Management Systems: Driving Performance. A Glance at Data-Driven Decisionmaking Practices (Pub. No. FHWA-HIF-09-021) is available online at www.fhwa.dot.gov/asset/if09021/index.cfm. For more information on the case study or to request printed copies, contact Nastaran Saadatmand in FHWA's Office of Asset Management, 202-366-1337 (email: nastaran.saadatmand@fhwa.dot.gov). To learn more about asset management, visit www.fhwa.dot.gov/infrastructure/asstmgmt. ✻

FHWA Solicits Projects for ASR Field Trial

The Federal Highway Administration's (FHWA) Alkali-Silica Reactivity (ASR) Development and Deployment Team is searching for proposed concrete overlay projects for an upcoming ASR field trial. If your State is planning a concrete overlay on an ASR-affected pavement and you are interested in participating in a field trial of ASR mitigation methods, contact Gina Ahlstrom at FHWA, 202-366-4612 (email: gina.ahlstrom@fhwa.dot.gov).

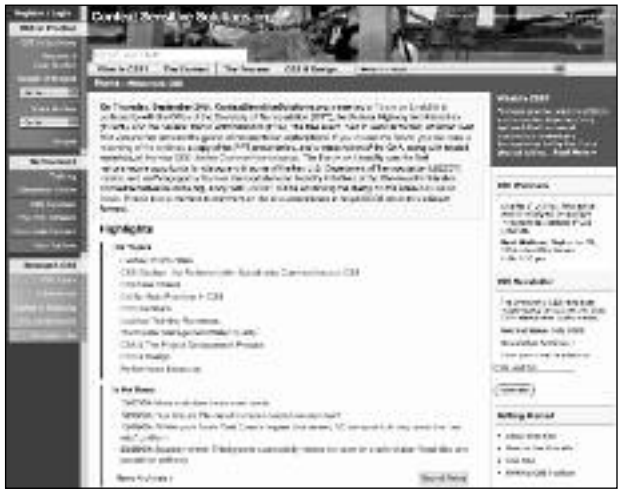
For more information on ASR, visit FHWA's online ASR Reference Center. Located at www.fhwa.dot.gov/pavement/concrete/asr/reference.cfm, the site features an overview of ASR, as well as research reports, specifications, guidance documents, case studies, and links to other useful Web sites. Information is also available in FHWA's free quarterly newsletter, *Reactive Solutions.* To subscribe, send an email to asrnewsletter@transtec.us. Past issues of *Reactive Solutions* are available online at www.fhwa.dot.gov/pavement/concrete/asr.cfm. ✻



Quantifying the Benefits of Context Sensitive Solutions

Creating more liveable communities and sustainable transportation facilities is the desired result from applying context sensitive solutions (CSS) principles in the planning and development of surface transportation projects. The integration of CSS principles is intended to result in a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility. CSS can be applied to all aspects of project development, from planning and design to construction, operations, and maintenance. The use of CSS supports liveable communities, which provide transportation choices that promote place-based transportation policies that are centered on people. With more and more States using CSS today for transportation initiatives, a new report available from the National Cooperative Highway Research Program (NCHRP) looks at how to categorize and measure the benefits resulting from CSS projects.

Quantifying the Benefits of Context Sensitive Solutions (NCHRP Report 642) presents successful practices that agencies have used to assess the value and benefits of integrating CSS principles in the development of projects. Also featured are guidelines for quantifying the benefits of applying CSS principles, as well as training materials that State and local transportation agencies can use in applying the guidelines to their own transportation programs or projects. The guidance was developed by assessing CSS case studies from across the country. Case studies featured include the Smith Creek Parkway in Wilmington, North Carolina, an urban coastal highway and rail project that has provided stakeholder, environmental, community, and safety benefits. Also highlighted is Iowa's Keosauqua Bridge project on Highway 1. This historic bridge replacement project improved safety for drivers, bicyclists, and pedestrians while incorporating aesthetic enhancements and maintaining harmony with the surrounding environment. Each case study in the report was assessed using 15 principles of CSS, which range from using interdisciplinary teams and involving stakeholders to addressing community and social issues, utilizing the full range of design choices, addressing aesthetic treatments and enhancements, and using agency resources effectively.



To learn more about context sensitive solutions, visit www.contextsensitivesolutions.org.

The report details 22 categories of benefits resulting from CSS projects, including improved project scoping and budgeting, increased stakeholder and public participation, decreased costs, minimized overall impact to the human and natural environment, decreased time for project delivery, improved safety, and improved quality of life for the community. As the report notes, "a project that creates lasting value for the community will improve quality of life, since it reflects the community vision and addresses the public and stakeholder issues and concerns."

The report's guidelines for quantifying the benefits of CSS walk transportation agencies through the necessary steps, including using standardized methods and data collection tools, defining CSS principles and benefits, and using reliable performance measures. Also featured is a project example that illustrates a complete application of the guidelines.

Quantifying the Benefits of Context Sensitive Solutions is available at www.trb.org/Publications/Public/PubsNCHRPProjectReports.aspx. To learn more about context sensitive solutions, visit www.contextsensitivesolutions.org. More information on the Federal Highway Administration's (FHWA) CSS resources is available at www.fhwa.dot.gov/context/index.cfm, or by contacting K. Lynn Berry at FHWA, 404-895-6212 (email: K.Lynn.Berry@fhwa.dot.gov). *

Highway Technology Calendar

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

Fourth Asphalt Shingle Recycling Forum
November 5–6, 2009, Chicago, IL

Hosted by the Construction Materials Recycling Association, forum sponsors also include the Asphalt Roofing and Manufacturers Association, Owens Corning, Federal Highway Administration (FHWA), U.S. Environmental Protection Agency, National Roofing Contractors Association, and the National Asphalt Pavement Association. Three roundtables will be held on November 5 for transportation agency officials; environmental officials; and shingle recyclers, hot-mix asphalt producers, and other industry partners.

Contact: Audrey Copeland at FHWA, 202-493-3097 (email: audrey.copeland@fhwa.dot.gov), or visit www.shinglerecycling.org.

World Steel Bridge Symposium
November 17–20, 2009, San Antonio, TX

Organized by the National Steel Bridge Alliance and FHWA, the symposium brings together steel bridge owners, designers, and contractors from around the world to discuss all aspects of steel bridge design and construction.

Contact: Elizabeth Robelet at the American Institute of Steel Construction, 312-670-5421 (email: robelet@aisc.org); or Vasant Mistry at FHWA, 202-366-4599 (email: vasant.mistry@fhwa.dot.gov). Information is also available at www.steelbridges.org.

Transportation Research Board (TRB) 89th Annual Meeting
January 10–14, 2010, Washington, DC

More than 3,000 presentations in nearly 600 sessions will spotlight current developments in transportation research, policy, and practice. The theme for the 2010 meeting is "Investing in Our Transportation Future—Bold Ideas to Meet Big Challenges."

Contact: For information, visit the TRB Web site at www.trb.org (click on "Annual Meeting"). Questions about the meeting can be emailed to trbmeetings@nas.edu.

First International Conference on Pavement Preservation
April 12–16, 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, 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.

FOCUS

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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A Compilation of Design-Build Practices for Transportation Projects

Now available online is *Current Design-Build Practices for Transportation Projects,* a compilation of practices nationwide released by the Transportation Design-Build Users Group. The users group includes representatives from the Design-Build Institute of America's Owner Council; Transportation Construction Management Working Group, which is a joint venture of the American Association of State Highway and Transportation Officials, Federal Highway Administration (FHWA), and industry; and others who have an interest in sharing experiences with the design-build project delivery method.

Using the design-build project delivery process, a project owner executes a single contract for both architectural/engineering services and construction. The design-builder may be a single firm, a consortium or joint venture, or other organization. Design-build can promote innovation, streamline coordination between the design and construction teams, reduce project costs, and result in time savings. The Louisiana Department of Transportation and Development, for example, used the design-build method to fast track the $40 million emergency repair of the bridge over Lake Pontchartrain between New Orleans and Slidell after the bridge was severely damaged by Hurricane Katrina in 2005.

The compilation of current design-build practices was originally prepared in 2002 for the New York State Department of Transportation by Parsons Brinckerhoff. The new version is the fourth update of the report. Among the topics covered in the report are the procurement process, contract issues, project management, payment, schedule, risk allocation, warranties and maintenance, environmental permitting process, legal issues, and major lessons learned.

Approximately 40 States have statutory authority to use the design-build project delivery method, and about 15 States are active users of the method.

The compilation report is available online at www.fhwa.dot.gov/construction/contracts/pubs/dbpractice. Additional input is encouraged from other State transportation departments and public transportation agencies that have experience with the design-build process. For more information or to submit contributions, send an email to Jerry Yakowenko at FHWA, gerald.yakowenko@fhwa.dot.gov (phone: 202-366-1562). To learn more about design-build project delivery, visit www.fhwa.dot.gov/construction/cqit/desbuild.cfm. *

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