

# FOCUS

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## Federal-Aid Essentials for Local Public Agencies

*Your Gateway to Navigating the Federal-Aid Highway Program*



It's Federal-aid, simplified. A new online video library launched by the Federal Highway Administration (FHWA) offers local transportation and public works agencies an extensive directory of resources for navigating the Federal-aid Highway Program and understanding its policies and procedures. Local agencies own and operate 75 percent of the Nation's roadways, collectively managing about \$7 billion in Federal-aid highway projects.

"Some local agencies have extensive Federal-aid experience and others are new to it. This new video library aims to help fill the gaps in knowledge and explain sometimes complex regulations. It is a great place to start for those needing information," said Rob Elliott of the FHWA Resource Center.

Available 24 hours a day at [www.fhwa.dot.gov/federal-aidessentials](http://www.fhwa.dot.gov/federal-aidessentials) and specifically designed for local agencies, Federal-aid Essentials for Local Public Agencies features seven main categories:

- Federal-aid Program Overview.
- Civil Rights.
- Environment.
- Finance.



Visit Federal-aid Essentials for Local Public Agencies at [www.fhwa.dot.gov/federal-aidessentials](http://www.fhwa.dot.gov/federal-aidessentials).

- Right-of-Way.
- Project Development.
- Project Construction and Contract Administration.

Agencies can consult the Project Development section for information on cost effectiveness determinations and public interest findings, for example, or guidance on value engineering requirements for Federal-aid projects and statewide planning requirements. In the area of Project Construction

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[www.fhwa.dot.gov/publications/focus/index.cfm](http://www.fhwa.dot.gov/publications/focus/index.cfm)



U.S. Department  
of Transportation  
**Federal Highway  
Administration**

and Contract Administration, topics include construction quality assurance, design-build procurement, Buy America field compliance, and change orders. Local agencies seeking a broader introduction to Federal-aid, meanwhile, can turn to the Federal-aid Program Overview, which highlights stewardship and oversight, funding basics and eligibility, and project requirements, among other topics.

Most videos are 4 to 7 minutes long, offering a concise explanation in plain language and with illustrated examples. Videos can be viewed in any order and at any time. Companion materials such as a printable script for each video and applicable Code of Federal Regulations references accompany the presentations, along with links to further resources. These links showcase a comprehensive listing of State resources that local agencies can consult, including Local Technical Assistance Programs (LTAPs), manuals, and references.

“The video library can also benefit many other entities, including consultants, contractors, LTAPs, and members of the American Association of State Highway and Transportation Officials and National Association of County Engineers,” said Elliott.

Visitors to the Federal-aid Essentials site can choose areas of interest and sign up for email alerts when new material becomes available. Agencies can also provide feedback to help FHWA continue to update and enhance the site.

To start using Federal-aid Essentials for Local Public Agencies today, visit [www.fhwa.dot.gov/federal-aidessentials](http://www.fhwa.dot.gov/federal-aidessentials). For additional information or to submit a question about the site, send an email to [lpa-feedback@dot.gov](mailto:lpa-feedback@dot.gov). \*

## EDC 2: The Next Wave of Highway Innovation



**G**et ready for the second wave of innovation.

The Federal Highway Administration (FHWA) has rolled out the next round of technologies and practices to be promoted by its Every Day Counts (EDC) initiative. Launched in 2010, EDC focuses on deploying innovations with proven benefits in shortening the time needed to complete highway projects. This includes the planning, permitting, and design phases of projects, as well as construction. Many of the innovations offer additional benefits such as enhanced safety, improved quality, and reduced impact on the driving public during construction.

The 13 EDC 2 innovations range from using intelligent compaction to achieve higher quality, longer lasting roadways to employing 3D modeling technology to increase productivity and efficiency for construction operations. FHWA will promote these particular initiatives for 2 years through its State division offices and Resource Center.

Every State has applied one or more of the 15 technologies and practices promoted during the first round of EDC innovations, and many of the innovations are now widely used. More than 40 States have implemented the Safety Edge<sup>SM</sup>, for example. This paving technique shapes the edge of the pavement to approximately 30 degrees, rather than the vertical or near vertical edge that typically results from standard techniques. The Safety Edge allows drivers who drift off the roadway to return to the road smoothly and easily.

### EDC 2 Innovations

*Programmatic Agreements II.* Programmatic agreements establish a streamlined approach to handling routine environmental requirements for a transportation project. This initiative builds upon the programmatic approaches previously deployed by EDC by applying some of the newly developed agreements to new States or expanding them to include regions. FHWA will also focus on developing new agreements or expanding existing agreements with the U.S. Army Corps of Engineers and U.S. Fish and Wildlife Service.

*Locally Administered Federal-aid Projects.* FHWA has developed a three-pronged strategy to assist local public agencies with the complexities of Federal-aid Highway Program requirements and processes. This strategy features certification and qualification programs, indefinite-delivery and indefinite-quantity consultant contracts, and stakeholder committees.

*3D Modeling for Construction Means and Methods.* Widely used by contractors for building construction and other projects, this technology's potential for highway



Intelligent compaction rollers accelerate project completion and improve the quality of compaction operations.



(left) The Bowman Road Bridge in Defiance County, OH, was the first bridge in the world to use the Geosynthetic Reinforced Soil Integrated Bridge System.

(below) More than 40 States have implemented the Safety Edge<sup>SM</sup> paving technique, which allows drivers who drift off the roadway to safely and smoothly return to the road.



applications is just now being realized. Benefits include increased productivity and efficiency during construction.

*Intelligent Compaction (IC).* IC delivers a modern approach to pavement compaction with the use of special vibratory rollers equipped with accelerometers, an integrated measurement system, a global positioning system, and an onboard display and reporting system. Using IC rollers accelerates project completion and improves the quality of compaction operations, resulting in longer-lasting pavements and reduced maintenance costs.

*Accelerated Bridge Construction (ABC).* ABC technologies allow transportation agencies to replace bridges faster and more safely. The accelerated project times significantly reduce traffic delays and road closures and can potentially reduce project costs. EDC 2 is promoting three ABC technologies.

Using prefabricated bridge elements and systems (PBES), bridge components and even entire bridges can be manufac-

**EDC focuses on deploying innovations with proven benefits in shortening the time needed to complete highway projects.**

ured and assembled off site and then moved into place in hours. Slide-in bridge construction is a PBES technique where a bridge is built adjacent to an existing structure and then slid into place once the old bridge is removed. And the Geosynthetic Reinforced Soil Integrated Bridge System uses closely spaced geosynthetic reinforcement and granular soils as a composite material to build enhanced abutments and approach embankments.

*Design Build (DB).* DB is an accelerated project delivery method in which the design and construction phases of a project are combined into one contract. This allows aspects of design and construction to take place at the same time and encourages innovation.

*Construction Manager/General Contractor (CMGC).* Using the CMGC process, the project owner hires a contractor to provide feedback during the design phase of a project, before the start of construction. Once the design phase is complete, the contractor and project owner negotiate

on the price for the construction contract. This process allows the contractor to offer input on innovations, best practices, and strategies for reducing cost and schedule risks, while allowing the project owner to assist in the design process and make informed decisions regarding cost and schedule.

*Alternative Technical Concepts (ATC).* An ATC is a suggested change by a contractor to the contracting agency's basic configuration design, scope, or construction criteria contained in a project's Request for Proposal. ATCs provide competing contractors the opportunity to suggest innovative, cost-effective project solutions.

*High Friction Surfaces.* High friction surface treatment applies high-quality aggregate with friction values far exceeding conventional pavement friction to existing or potential high-crash areas on roadways to help motorists maintain better control. The treatment can dramatically reduce crashes and related injuries and fatalities.

*Intersection and Interchange Geometrics.* Several innovative alternative geometric intersection and interchange designs are now available that reduce crossover or con-

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# Achieving the Bridges of Tomorrow: The Long-Term Bridge Performance Program

**T**he Federal Highway Administration (FHWA) Long-Term Bridge Performance (LTBP) program continues to move forward in advancing knowledge of bridge performance.

Many factors influence the condition and performance of bridges. Structures differ greatly by span type, design features, construction materials, dimensions, live load histories, environmental and climatic factors, and physical changes that occur on the bridge. A bridge's history of maintenance, preservation, and rehabilitation is also a variable that influences long-term performance.

Launched in 2008, the LTBP program will capture and document the performance of a representative sample of bridges nationwide. This effort will encompass detailed inspection, periodic monitoring, evaluation and testing, and possible forensic investigation. The bridges will feature several representative structural types and materials, as well as variations in geometry, age, traffic volume, truck loads, and climatic conditions.

Ultimately this comprehensive study will result in a high-quality body of data and knowledge, leading to the development of improved life-cycle cost and deterioration models, better understanding of bridge deterioration, and improved effectiveness of maintenance and repair strategies. The data will also support improved design methods and bridge preservation practices, as well as facilitate

The LTBP program will capture and document the performance of a representative sample of bridges nationwide.



Pilot bridges for the Long-Term Bridge Performance (LTBP) program included this steel deck truss bridge in Sandstone, MN.

the development of the next generation of bridges and bridge management tools.

In 2009, the program began a pilot study to validate protocols for data collection and management and obtain a baseline understanding of bridge deck performance and deterioration. "This initial effort was intended to ensure that all of the components needed to achieve the long-term objectives of the LTBP program were well defined before initiating work on a large population of bridges nationwide," said Hamid Ghasemi, Manager of the LTBP program at FHWA.

Seven bridges in California, Florida, Minnesota, New Jersey, New York, Utah, and Virginia were studied, providing a broad representation of environmental conditions experienced throughout the United States. "Execution of the pilot

phase was quite complex and provided many lessons learned, resulting in FHWA reexamining the methods for field work, particularly with respect to coordination between field personnel and State highway agencies," said Ghasemi. "Protocols have now been developed to ensure that the program collects early and useful quality data." The protocols are not standards but rather a guide to refine and streamline testing methodologies.

Protocols include:

- Finite element modeling.
- Visual inspection.
- Nondestructive evaluation.
- Physical sampling.
- Live-load testing.
- Dynamic testing.
- Long-term instrumentation.

The program's long-term data collection phase is scheduled to begin in November 2012. This first phase will focus on steel stringer and prestressed concrete multi-girder bridges in the Mid-Atlantic region, with potentially 75 bridges tested.

More information on the LTBP program will be available in a collection of reports and technical briefs to be released by spring 2013. These publications will include a summary of the program's pilot phase, as well as individual reports on each bridge included in the pilot phase. Also being developed are a Bridge Performance Primer and reports on Protocols for Data Collection, High-Priority Bridge Performance Issues, and Identifying Bridge Data Needs.

One product under development is the Bridge Portal, a Web-based centralized data storage and retrieval application. This application will incorporate in one location not only legacy bridge data but also traffic, weather, seismic, mainte-

nance, and preservation data, as well as data collected from LTBP bridge sites. The Bridge Portal will also incorporate data-driven life cycle and deterioration models, which will allow users to investigate bridge performance holistically.

As the LTBP program moves into the data collection phase, FHWA continues to reach out to stakeholders to seek input on the design and direction of the program. The Transportation Research Board provides guidance through its LTBP Advisory Committee, as well as input on specific research areas through its Durability and Preservation, Evaluation and Monitoring, and Traffic and Truck Weights Expert Task Groups.

FHWA held focus group meetings with the bridge offices of 15 State transportation departments to discuss the program's objectives and needs. FHWA also established the LTBP State Coordinators Committee, which includes a representative from transportation agencies in each State; Washington, D.C.; and Puerto

Rico. "The input from the State coordinators has already been influential in the program's technical coordination and implementation," said Ghasemi.

Participation by the bridge engineering community is also very important to the success of the program. FHWA issued a Request for Information earlier this year for industry organizations to discuss ways that they could collaborate with the LTBP program. A public meeting was then held in July 2012 that included representatives from manufacturing and trade organizations, consultants, contractors, and academia. Future involvement with selected organizations may include sharing of bridge data or contributions of products, services, or expertise that support the LTBP program.

For more information on the LTBP program, visit [www.fhwa.dot.gov/research/tfhrc/programs/infrastructure/structures/ltpb](http://www.fhwa.dot.gov/research/tfhrc/programs/infrastructure/structures/ltpb), or contact Hamid Ghasemi at FHWA, 202-493-3024 (email: [ltpb@dot.gov](mailto:ltpb@dot.gov)). \*



Also studied in the LTBP program's pilot phase was this continuous steel stringer bridge in Prince William County, VA.

# Accelerating Innovation with the 2012 Highways for LIFE Projects

The Federal Highway Administration's (FHWA) Highways for LIFE (HfL) program has awarded nearly \$9 million in 2012 incentive funding to projects in 10 States and Puerto Rico. The program promotes proven but infrequently used innovations for accelerating project completion and achieving safe and efficient highways and bridges with longer life spans.

A project on U.S. 101 in Santa Clara, California, will receive \$2 million to help fund "Virtual Design Construction." This 3-D mapping technology increases the productivity and efficiency of construction operations. Louisiana received \$900,000 to implement a wide-area radar system in New Orleans that will keep drivers informed about real-time traffic conditions and reduce construction-related traffic congestion on U.S. 90 Business. A grant of \$500,000 will help implement ultra-high performance concrete (UHPC) on U.S. 6 near Provo, Utah. The UHPC technology will accelerate construction and reduce the impact to drivers.

Washington State will use its \$182,600 grant to fund state-of-the-art barrier delineators and lane markers on I-90 over Snoqualmie Pass in Hyak. These innovations will improve driving conditions both at night and during inclement weather and reduce roadway maintenance needs. On Highway 196 in Johnson County, Wyoming, a \$520,000 grant will allow for the use of warm-mix asphalt to achieve better long-term pavement performance and enhanced safety.

West Virginia will use its \$400,000 grant to implement a precast concrete paving system on U.S. 60W near Charleston to extend the life of the pavement, reduce construction time, and improve safety for both motorists and workers. In Virginia, the Staffordboro Park and Ride



Ultra-high performance concrete (UHPC) is among the innovations being promoted by the Highways for LIFE program's 2012 funding. Structures built using UHPC across the country include the Route 31 bridge in Lyons, NY.

Expansion project in Stafford County received \$1.32 million for the use of roller compacted concrete, which enables immediate opening of the roadway to traffic and is durable under heavy loads.

Several funded projects will improve safety and reduce construction time by using accelerated bridge construction (ABC) technologies. Maine received \$580,000 for its use of precast deck panels with corrosion-resistant composite reinforcing bars. Precast concrete will be used in Puerto Rico for a bridge replacement on PR-30 over PR-189 in Gurabo. Funded with the assistance of a \$440,000 grant, this innovation will cut construction time from 18 months to an expected 8 months. Minnesota will use a \$700,000 grant to install prefabricated substructures on Trunk Highway 61 over Nymphara Lane Bridge in Red Wing. The prefabricated technology will cut construction time in half. And in New York, a \$1,407,400 grant will help fund the use of ABC techniques for the rehabilitation of the I-190 bridge over Buffalo Avenue in Niagara Falls.

For more information about the 2012 projects and their featured innovations, visit [www.fhwa.dot.gov/hfl](http://www.fhwa.dot.gov/hfl), or contact Mary Huie at FHWA, 202-366-3039 (email: [mary.huie@dot.gov](mailto:mary.huie@dot.gov)).\*

## Infrastructure Innovation Webinars

*These free Webinars provide a quick introduction to the latest infrastructure innovations and technologies.*

### Federal Highway Administration (FHWA) Load and Resistance Factor Rating (LRFR) Implementation Webinar Series

#### *Application of Load Testing in Bridge Load Rating*

September 20, 2012, 1–4 p.m.

(eastern daylight time)

December 6, 2012, 1–4 p.m.

(eastern standard time)

The Webinars will provide participants with the latest information on using the load testing technique to evaluate live load carrying capacity of bridges. Among the highlights will be resources available and lessons learned. Topics for the September session include application of load testing techniques in bridge load rating, such as diagnostic static load testing, and ambient vibration dynamic load testing for bridge evaluation. The December session will focus on experiences in North Carolina and Rhode Island, as well as load testing of bridges at Logan Airport in Boston, Massachusetts.

The target audience for the Webinars includes bridge and structures staff from local, regional, and State transportation agencies; FHWA staff; and consultants. Participants will have the opportunity to download Webinar presentations.

To register for the September Webinar, visit <https://connectdot.connectsolutions.com/diagnostic/event/registration.html>. Registration for the December Webinar is available at <https://connectdot.connectsolutions.com/loadtest02/event/registration.html>. For more information, contact Lubin Gao at FHWA, 202-366-4604 (email: [lubin.gao@dot.gov](mailto:lubin.gao@dot.gov)).\*

# Highway Technology Calendar

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

## **International Conference on Long-Life Concrete Pavements**

September 18–21, 2012, Seattle, WA

Organized by the Federal Highway Administration (FHWA), in partnership with the National Concrete Pavement Technology Center, the conference will address concrete pavement design, construction, and materials technologies that result in long-life, sustainable concrete pavement. A mini-symposium on concrete paving durability will be held on the final day of the conference.

*Contact:* Sam Tyson at FHWA, 202-366-1326 (email: sam.tyson@dot.gov). Conference information is also available at [www.fhwa.dot.gov/pavement/concrete/2012conf.cfm](http://www.fhwa.dot.gov/pavement/concrete/2012conf.cfm).

## **2012 Industrial Materials Conference**

November 28–29, 2012, Indianapolis, IN

The conference will feature best practices in the use of high-volume recycled materials in sustainable pavement systems. Conference sponsors include FHWA, the Industrial Resources Council, and the Indiana Department of Transportation.

*Contact:* Lee Gallivan at FHWA, 317-226-7493 (email: victor.gallivan@dot.gov), or visit [www.industrialresourcescouncil.org/events/2012IMC](http://www.industrialresourcescouncil.org/events/2012IMC).

## **Transportation Research Board (TRB) 92nd Annual Meeting**

January 13–17, 2013, Washington, DC

More than 11,000 transportation professionals from around the world will gather to share perspectives on current developments in transportation research, policy, and practice. The spotlight theme for 2013 is “Deploying Transportation Research—Doing Things Smarter, Better, Faster.”

*Contact:* For information, visit the TRB Web site at [www.trb.org](http://www.trb.org) (click on “Annual Meeting”). Questions about the meeting can be emailed to [trbmeetings@nas.edu](mailto:trbmeetings@nas.edu).

## **2013 Design-Build in Transportation Conference**

March 18–20, 2013, Orlando, FL

Join transportation leaders in discussing lessons learned in the use of the design-build project delivery method for transportation projects. Discussions will cover choosing the right delivery method, contracting approaches, innovative financing solutions, risk allocation, and performance contracting.

*Contact:* Jerry Yakowenko at FHWA, 202-366-1562 (email: gerald.yakowenko@dot.gov), or visit [www.dbtranspo.com](http://www.dbtranspo.com).

## **Seventh National Seismic Conference on Bridges and Highways**

May 20–22, 2013, Oakland, CA

Conference sessions will focus on understanding and mitigating damage

to the Nation’s highway infrastructure from earthquakes and other natural hazards. Sponsors include FHWA; the California Department of Transportation; TRB; American Association of State Highway and Transportation Officials; University at Buffalo, The State University of New York; and the Multidisciplinary Center for Earthquake Engineering Research.

*Contact:* Phillip Yen at FHWA, 202-366-5604 (email: wen-huei.yen@dot.gov), or visit <http://7nsc.info>.

## **Second National Covered Bridge Conference**

June 5–8, 2013, Dayton, OH

The FHWA National Historic Covered Bridge Preservation Program is sponsoring the conference in partnership with the National Park Service and U.S. Forest Service. Themes include research and rehabilitation projects, best practices for rehabilitation, and continuing threats and challenges to covered bridges, including damage caused by Hurricane Irene and Tropical Storm Lee in 2011. Participants will have the opportunity to tour several historic covered bridges.

*Contact:* Everett Matias at FHWA, 202-366-6712 (email: everett.matias@dot.gov), or visit [www.woodcenter.org/2013-national-covered-bridge-conference](http://www.woodcenter.org/2013-national-covered-bridge-conference). \*

# 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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flict points on the roadway or move the conflict points away from a main intersection, allowing for safer travel for motorists, pedestrians, and bicyclists. These designs include roundabouts and diverging diamond interchanges.

**Geospatial Data Collaboration.** Most geographic information systems (GIS) and Web-mapping applications at Federal, State, and local agencies are currently housed internally. This innovation will use cloud-based GIS services to improve data sharing both within transportation agencies and among project stakeholders.

**Implementing Quality Environmental Documentation.** The initiative will implement existing recommendations and promote recent best practices to improve the quality and reduce the size of National Environmental Policy Act documents, resulting in accelerated project completion and improved environmental sustainability.

**Strategic Highway Research Program (SHRP) 2 National Traffic Incident Management Responder Training.** Traffic incidents put both motorists and responders at risk and account for approximately 25 percent of all traffic delays and more than 2.8 billion gallons



For more information about the EDC 2 innovations, visit [www.fhwa.dot.gov/everydaycounts](http://www.fhwa.dot.gov/everydaycounts).

of gasoline wasted each year. This SHRP 2 training examines requirements for the safe and quick clearance of traffic incident scenes, as well as methods for safeguarding both motorists and responders.

For more information about the EDC 2 innovations, contact your local FHWA division office or visit [www.fhwa.dot.gov/everydaycounts](http://www.fhwa.dot.gov/everydaycounts). \*