Accelerated Bridge Construction Picks Up Steam

Across the nation, accelerated bridge construction is speeding project delivery times, a goal of the Highways for LIFE program.

ABC involves prefabricating an entire bridge near the actual site, then moving it into place in a matter of hours or a weekend. As well, some states are accelerating bridge construction by prefabricating major bridge components off-site, then hauling them to the bridge site and installing them.

ABC techniques reduce on-site construction time, minimize traffic impacts, improve work zone safety, decrease environmental impact, increase bridge constructability, boost quality and lower life-cycle costs, said Lloyd Wolf, bridge design group leader at the Texas Department of Transportation. The Texas DOT has used ABC techniques for five years.

“ABC is increasingly being used by several states, including Utah, Texas, Florida, Louisiana and New York,” said Vasant Mistry, Bridge and Tunnel Team leader in the Federal Highway Administration’s Office of Bridge Technology. “Utah is an especially good success story with ABC.”

Utah Success Story

Indeed, the Utah Department of Transportation has used accelerated construction techniques on some 80 bridges in recent years, said Jim McMinimee, Utah DOT director of project development. What’s more, the agency is 80 percent of the way to making ABC standard practice for all bridges, a goal the state wants to achieve by 2010 or earlier. Utah would be the first state in the nation to do that.

Project Tests Safer Way to Install Markers

One of the least-liked highway jobs is riding on a seat attached to the underside of a truck, inches from oncoming traffic, installing pavement markers by hand. The reflective markers boost safety by making it easier for drivers to see lanes in the dark, but installing them manually is risky for workers.

With the help of a Technology Partnerships grant, Stay Alert Safety Services Inc. of Kernersville, N.C., is developing an automated system for safer installation of pavement markers. In a fall 2008 field test, the prototype’s performance exceeded expectations for safety and reliability, paving the way for tests on road projects in 2009.

“We’re very pleased with the results of the field test,” said Stay Alert Project Manager Tony Collins. “We’re really beyond what we anticipated at this point.”

With the help of a Technology Partnerships grant, Stay Alert Safety Services Inc. of Kernersville, N.C., is developing an automated system for safer installation of pavement markers. In a fall 2008 field test, the prototype’s performance exceeded expectations for safety and reliability, paving the way for tests on road projects in 2009.

“We’re very pleased with the results of the field test,” said Stay Alert Project Manager Tony Collins. “We’re really beyond what we anticipated at this point.”

With the help of a Technology Partnerships grant, Stay Alert Safety Services Inc. of Kernersville, N.C., is developing an automated system for safer installation of pavement markers. In a fall 2008 field test, the prototype's performance exceeded expectations for safety and reliability, paving the way for tests on road projects in 2009.

“The Technology Partnerships Program, part of the Highways for LIFE initiative to accelerate highway industry innovation, provides funds to develop technologies at the prototype stage. The goal is to test promising technologies that cut congestion or enhance highway quality and safety in real-world settings and move them closer to the marketplace.
Upcoming conferences, at 2:30 p.m. Eastern time, include the following:

- Bridge Inspection, March 11
- Connections Manual for Prefabricated Bridge Elements and Systems, April 8
- May 6
- June 10

Transportation professionals who want to learn more about using innovation can start with either the “Leap Not Creep” course or the “Innovations” Web conferences, said Kathleen Bergeron, marketing communications coordinator for Highways for LIFE.

“They reinforce each other,” she said. “You can learn how to incorporate innovative practices into agency operations through the course, and you can get the latest information on how specific innovations are being used through the monthly series.”


Highways for LIFE Wins Gold

The Highways for LIFE toolkit on prefabricated bridge elements and systems has won a MarCom Gold Award from the Association of Marketing and Communication Professionals. The award, which recognizes outstanding achievement in marketing and communications, goes to organizations throughout the world whose work serves as an industry benchmark.

The winning DVD, “Promotional Kit for a Highway Technology: Prefabricated Bridges,” includes two videos, four article reprints, a report on bridge technology decision making, a manual on self-propelled modular transporters and Web links. It was created in DVD form so it can be updated and distributed easily as new materials on the technology become available.

For a copy of the DVD, contact Lizzie Morris at (202) 366-0131 or elizabeth.pollock@dot.gov. For more information, contact Kathleen Bergeron at (202) 366-5508 or kathleen.bergeron@dot.gov.
In Louisiana, the state Department of Transportation and Development used SPMTs to repair damage done by Hurricane Katrina to the I-10 twin bridges across Lake Pontchartrain. Fifty-four-foot spans fell into the water and 473 spans shifted laterally. “By using the self-propelled modular transporters placed on barges, we shifted the spans back into position,” said Hossein Ghara, state bridge design engineer.

“Four other Utah bridges that used SPMTs were on I-80 between Salt Lake City and Park City. ‘For that project we replaced the four bridges with two weekend closures,’ said McNimiee. ‘The last SPMT project UDOT did was a bridge replacement at I-215. That last one was removed and re-placed at I-215 and 3300 South in less than 16 hours.’

Last summer the agency completed a two-lane bridge on U.S. Highway 6 for which all components—from foot-ings on up—were prefabricated. ‘On that one we saved a complete construction season by using ABC methods,” said McNimiee.

### Contractor Input

As well, Utah has been making rapid progress with ABC documentation. The state has hired a consultant to help write ABC standards. He’s working with local contractors and fabricators to gain input through a standing com- mittee of the Associated General Contractors of America. ‘We have a running dialogue with a committee that was made up from our local AGC chapter,” said McNimiee. ‘We’re really tapping into a lot of talent that our contracting industry has when we invite them to help with our standards.

For 2009, the Utah DOT has identified four bridges to move into place with SPMTs. Two are part of the $130 mil- lion Beck Street project in Salt Lake City, where SPMTs will move two new ramp bridges into position. And at a $260 million project near the town of American Fork on I-15, SPMTs will transport two new interchange bridges.

Photo Credit: Utah DOT
Innovation Helps Meet Today’s Highway Challenges

“A Daunting Challenge,” a new video on the Highways for LIFE initiative, is spreading the word on how the transportation community can harness innovation to improve the way highways are built. The following are highlights from the video, narrated by Gary Hoffman, retired deputy secretary of highway administration for the Pennsylvania Department of Transportation and a consultant on the Highways for LIFE project.

The nation’s highway system faces a perfect storm. “The needs to renew the system are tremendous, and all we have to do is look at the conditions of our bridges to see that,” Hoffman explains in the video. “That renewal has to take place under tremendous traffic—that has to be maintained during construction.”

At the same time, highway construction costs have increased dramatically—as much as 70 percent—over the past few years while revenues dedicated to highway construction have remained flat or decreased. “There was a time when we could afford to do things the same old way, but not anymore,” Hoffman says. “Our industry has got to quickly put into practice new technologies and innovations—inventions that are proven and that will build highways better, faster, with less intrusion on traffic, safer—and oh, by the way, less expensively.”

To help meet today’s transportation challenges, the U.S. Congress established Highways for LIFE, a Federal Highway Administration pilot program, in the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). The initiative features several components, including grants for construction projects that use innovations that enhance safety and quality while cutting traffic congestion. So far, 16 states have received Highway for LIFE funds for projects highlighting more than two dozen innovations.

- The Minnesota Department of Transportation used a full road closure to rebuild part of a major arterial that included a busy interstate interchange. As a result, the work was completed in one construction season, rather than two or three.
- In Salt Lake City, the Utah Department of Transportation used prefabricated bridge systems to build a new structure near an existing bridge while traffic flow continued unobstructed. The old structure was removed and the new one moved into place in one weekend.

Innovation Has Many Benefits

- State agencies in South Carolina, Georgia and Maryland used prefabricated bridge elements from the foundations to the deck that are put together in the field like Legos. These bridges go together faster and last longer.
- Transferring Technology
  “State transportation agencies have been great about trying these innovations on their highways, but FHWA could see that working in one state at a time might take a while,” Hoffman says.
  To speed up technology transfer, FHWA developed a new, more aggressive approach and tested it with several innovations, prefabricated bridge elements and systems, road safety audits, precast concrete pavement systems and techniques to improve work zone traffic control.

Under the approach, FHWA set up teams of specialists to develop marketing strategies to encourage fast, widespread adoption of the innovations. The strategies include technology transfer tools such as peer-to-peer exchanges, demonstration projects and video conferences.

Technology Partnerships, another facet of Highways for LIFE, provide funding to private industry to move promising technologies to the marketplace. So far, five new approaches are being developed under the program, and more are coming in 2009.

FHWA shares the program’s mission and activities through communication tools such as Web sites, brochures, trade show exhibits, the Innovator newsletter, and articles in trade and consumer publications.

What’s Next

As a result of Highways for LIFE, Hoffman notes, states are beginning to implement innovations as standard practice. “These Highways for LIFE technologies and approaches are proven. They’re working. It’s not just about a project or a product. It’s about changing a paradigm to always look for the best solution,” he says.

“When I started in the highway building business 35 years ago, we built new highways on new alignment. But today’s challenges are just as daunting. It’s rebuilding that system under tremendous traffic loads. It’s looking for better ways, higher quality and longer-lasting materials. It’s looking for ways to construct faster with less intrusion on the motorist. It’s looking for ways to improve safety. It’s looking for ways to do things more efficiently and less expensively.”

The video “A Daunting Challenge” suggests a variety of ways to take advantage of the Highways for LIFE initiative to accelerate innovation and enhance the way highways are built:

1. Learn more about the Highways for LIFE program and how it can improve the way agencies and other stakeholders deliver highways by visiting www.fhwa.dot.gov/hfl.
2. Implement performance goals for your construction projects that address safety, quality, congestion and customer satisfaction.
3. Consider incorporating innovations you’ve never or rarely used into projects you have scheduled.
4. Add a placeholder to your project delivery process for setting project goals and considering innovations.
5. Ask the Federal Highway Administration Division office to discuss with your staff about innovative practices to build roads safer, faster, better and less expensively.
6. Get specifics on successful projects that have used innovations on the Highways for LIFE Web site.
7. Participate in a workshop on “Performance Contracting for Construction” or “Seeking the Best Solutions.” Contact Mary Huie at (202) 366-3029 or mary.huie@dot.gov for details.
12. Consider using accelerated bridge construction techniques in your agency’s bridge program. See how the Utah Department of Transportation is doing it at dot.utah.gov/main?ip=000-226825398797 903.../VT, 1991.
13. Sign up for training in conducting road safety audits at the NHI Web site.
14. Study the applicability of precast concrete pavement systems for upcoming projects. View the “Precast Concrete Pavement Systems Videoconference” DVD, available from Lizzie Morris at (202) 366-0131 or elizabeth.pollock@dot.gov.
15. Take advantage of the peer exchanges on making work zones work better (ops.fhwa.dot.gov/wz/p2/index.htm) and road safety audits (safety.fhwa.dot.gov/rasa/p2p/brochure.htm).
16. Talk to your FHWA Division about applying for funding for Highways for LIFE demonstration construction project.
17. Learn about Technology Partnership projects to move promising prototypes to market-ready technologies. See www.fhwa.dot.gov/tech.cfm and contact Julie Zirlin at (202) 366-9105 or julie.zirlin@dot.gov.
18. Learn about the efforts of the American Association of State Highway and Transportation Officials Technology Information Group, which is working with Highways for LIFE on innovation deployment. Visit www.transportation.org/?siteid=57.
19. Attend a Technology Research Board session on technology. See the calendar www.trb.org/calendar.
20. Subscribe to FHWA’s Innovator newsletter about innovation in the highway industry. Send your name, mailing address and e-mail address to HILT@dot.gov.


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.

Ray H. LaHood, Secretary, U.S. DOT
Jeffrey F. Paniati, Acting Deputy Administrator, FHWA

Innovator Team
Byron Lord, Team Leader
Kathleen Bergeron, Program Coordinator
Mary Huie, Program Coordinator
Julie Zirlin, Technology Partnerships Coordinator
Ellen Schweppe, Managing Editor
Charles Churilla, Technical Editor
Sonya Darter, Designer
Elizabeth Morris, Printing Coordinator

Are you reading a pass-along copy of Innovator? Want to make sure you don’t miss a future issue? Keep Innovator coming by sending your name, mailing address and e-mail address to HILT@dot.gov. Subscriptions are free.

U.S. Department of Transportation
Federal Highway Administration

Federal Highway Administration
HIHL – Room E76-331
1200 New Jersey Avenue, SE
Washington, DC 20590