SHRP2 SOLUTIONS
TOOLS FOR THE ROAD AHEAD

Innovative Bridge Designs for Rapid Renewal (R04)

Standardized plans, designs, and concepts to use prefabricated elements to build and replace bridges faster

Challenge

The nation's aging bridge inventory, increased traffic congestion, and work-zone safety concerns call for new approaches to traditional sequential "construct-in-place" bridge building methods. The industry must find smarter, faster ways to replace bridges using techniques that will provide economies of scale in manufacturing and construction, reduce traffic disruption, and increase safety. Prefabricated bridge elements have been used in a number of states, but to date, each design is unique and requires a high level of engineering and construction oversight.

Solution

SHRP2's Bridge Designs for Rapid Renewal product provides state and local departments of transportation with a design toolkit for prefabricated bridge projects. Standardized approaches streamline the activities required to get bridge replacement systems designed, fabricated, and erected in less time, and installed in hours or days, rather than weeks or months.

The R04 toolkit provides the following:

- Standard design details, specifications, and concepts for foundation systems, substructure and superstructure systems, subsystems, and components.
- Recommended specification language for ABC systems that are suitable for future inclusion in the American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Bridge Design and Construction Specifications.
- A guidebook with instruction for bridge owners to use prefabricated elements that allows for rapid, cost-effective bridge replacements.
- Design examples for complete prefabricated bridge systems.

Although the need for an engineer of record is not eliminated completely, this toolkit makes prefabrication design accessible to more bridge owners, designers, and contractors at the state, county, and local levels.

Benefits

The R04 product can be used to build or replace typical bridges faster and at a lower overall cost. The concepts can be incorporated into thousands of small to medium span bridge projects with minimal alterations, resulting in reduced onsite construction time, minimized traffic delay and community disruption, improved work zone safety, and improved quality when compared with traditional construction practices. Using the toolkit and capitalizing on standardized approaches also enables local contractors and smaller agencies to deliver prefabricated bridge systems, since, in some cases, no special equipment or construction techniques are required.

Save Lives

Shorter bridge construction time minimizes worker exposure to oncoming traffic and traveler exposure to construction zone hazards.

Save Money

The toolkit enables local contractors with basic equipment to compete for ABC projects, and standardization of prefabricated elements holds the potential for vast cost savings – both in design/construction costs and roadway user costs.

Save Time

Using prefabricated elements significantly reduces construction time and minimizes traffic impacts.

RENEWAL

One of four SHRP2 focus areas, Renewal products help transportation organizations rapidly build and restore highway infrastructure that lasts longer while minimizing user disruption and delay.

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Visit: www.fhwa.dot.gov/GoSHRP2
Learn more about products, case studies, and implementation assistance.

The Implementation Assistance Program

Implementation assistance is available to help State departments of transportation (DOTs), metropolitan planning organizations (MPOs), and other interested organizations deploy SHRP2 Solutions. A range of opportunities is available to raise awareness of SHRP2 Solutions and to encourage early adoption of these products. Application periods are offered approximately twice per year. Each product selected for implementation assistance has the potential to deliver more efficient, cost-effective programs to meet the complex challenges facing transportation today.

How can you learn more?

Visit: www.fhwa.dot.gov/GoSHRP2

- Additional product information
- Information about how this product is being used in the field
- Contact information for peers who are familiar with this product
- Links to research reports

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About SHRP2 Implementation

The second Strategic Highway Research Program (SHRP2) is a partnership of the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), and the Transportation Research Board (TRB). TRB completed the research, and now FHWA and AASHTO are jointly implementing the resulting SHRP2 Solutions that will help the transportation community enhance productivity, boost efficiency, increase safety, and improve the reliability of the Nation's highway system.