

## Service Life Design for Bridges

### *Building a better bridge to deliver 100 or more years of service life*

Bridge design standards lead to bridges with many components, each with a different design life. What if every component of the bridge, including bearings, decks, expansion joints, girders, columns, and piles each were designed for a specific design life to ensure that the overall structure can be maintained to reach a design life of 100 years? Not only does this extend the service life of the structure, but it may also limit overdesign on some bridge elements. Designing to a service life provides a more predictable asset management and maintenance program and will ultimately allow owners to keep their structures in service longer for better return on investment.

---

### *Service Life Design for Bridges*

---

## The Solution

*Service Life Design for Bridges (R19A)* is a new reference document developed through the second Strategic Highway Research Program (SHRP2). It complements AASHTO specifications and equips designers to develop specific solutions for given conditions and constraints. The *Guide* addresses design, fabrication, construction, operation, maintenance, repair, and replacement issues and applies to both new and existing bridges. It includes standard plans, model specifications for design and construction, and detailed examples.

The *Guide* includes a fault tree flowchart that summarizes the factors that affect the service life of the bridge element or component under consideration. Each of these factors is thoroughly explained, resulting in an in-depth understanding of the important service-life-related factors for both new and existing bridges. The guide provides strategies and solutions to address the factors. **Recognition of service life factors and options to manage these factors will allow your staff to develop an optimal, customized solution for your particular bridge.**

### New design method for the next generation of bridges

---

FOCUS AREA:  
Renewal (R19A)

---

This new guide addresses the key factors that apply to new and existing bridges; it includes standard plans, model specifications, detailed examples, and a fault tree flowchart.

#### Save Lives

- Limits the need for lane closures and work zone restrictions, which greatly reduces safety concerns.



#### Save Money

- Maximizes service life of bridge, resulting in lower future costs and lower life cycle cost.



#### Save Time

- Fewer traffic delays by minimizing the need for bridge rehabilitation and maintenance work.



## The Benefits

- ▶ Provides longer service life by design through durable and state-of-the-art materials, construction techniques, and utilization of emerging technologies that are ideally suited for the bridge.
- ▶ Addresses service life issues at the design stage that will result in significant cost savings in maintenance and lower rehabilitation costs while the bridge is in service.
- ▶ Provides engineers with tools to select and design for longer-lasting bridge systems and subsystems for the appropriate environment. They result in longer-lasting bridge components that are easier to inspect and are better suited to their environment—factors that reduce maintenance, lane closures, and work zones.



Photo Credit: Iowa DOT / HNTB

## Who is using these tools?

*Service Life Design for Bridges* is currently being implemented in **Hawaii, Iowa, Maine, Oregon, Pennsylvania, and Virginia** through the FHWA/AASHTO Implementation Assistance Program.

## How can you learn more?

For more information, contact Raj Ailaney at FHWA, [Raj.Ailaney@dot.gov](mailto:Raj.Ailaney@dot.gov), or Patricia Bush at AASHTO, [pbush@AASHTO.org](mailto:pbush@AASHTO.org). For helpful tools and information, visit: <http://shrp2.transportation.org/Pages/ServiceLifeDesignforBridges.aspx>. Updates on the SHRP2 program can be found at [www.fhwa.dot.gov/GoSHRP2](http://www.fhwa.dot.gov/GoSHRP2) or <http://SHRP2.transportation.org>.

### About SHRP2 Implementation



The second Strategic Highway Research Program is a national partnership of key transportation organizations: the Federal Highway Administration, the American Association of State Highway and Transportation Officials, and the Transportation Research Board. Together, these partners conduct research and deploy products that will help the transportation community enhance the productivity, boost the efficiency, increase the safety, and improve the reliability of the Nation's highway system.

### Strategic Highway Research Program

U.S. Department of Transportation | Federal Highway Administration  
American Association of State Highway and Transportation Officials • Transportation Research Board

