U.S. Department of Transportation
Federal Highway Administration

2006

Priority, Market-Ready Technologies and Innovations

STRUCTURES

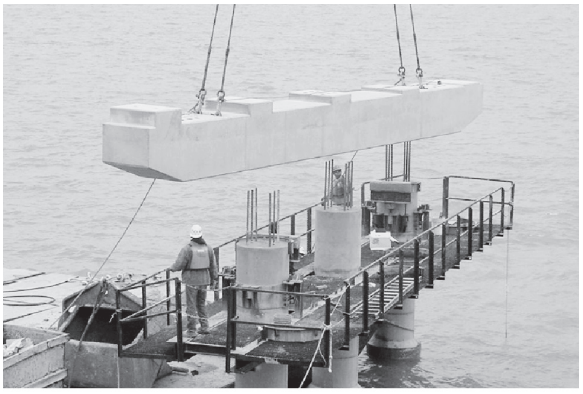
Prefabricated Bridge Elements and Systems (PFBES)

Problem: Transportation agencies are challenged to improve safety, reduce congestion, and undertake necessary construction projects

The top priority of transportation agencies is to stem the loss of more than 40,000 lives each year to crashes. At the same time, transportation agencies are committed to offering motorists high-quality, longer lasting highways and bridges while reducing construction time and traffic congestion that, taken together, cost the Nation $63 billion each year in wasted time and fuel. These agencies, however, also operate against a backdrop of challenges: a need for intensified construction activities to restore the Nation's aging transportation system, which largely was built in the 1950s and 1960s; capacity that has increased little in the past two decades; and growing communities and increasing traffic volumes.

Putting It in Perspective

Approximately one-third of the Nation's 590,000 bridges require rehabilitation or replacement. Bridge repair, rehabilitation, and replacement activities, however, can significantly impact bridge users. For example, full lane closures in large urban centers or on highways due to bridge projects can have a significant economic impact on commercial and industrial activities. In many cases, the direct and indirect costs of traffic detours, the loss of the use of the bridge during construction, and the disruption to the local economy caused by a bridge project can exceed the actual cost of the bridge structure. Lane closures and other bridge activities also can lead to safety issues. Because of these potential economic impacts and safety concerns, minimizing traffic disruptions during bridge rehabilitations and repairs is a critical issue that should be considered as important as maintaining construction quality and reducing the life cycle costs and environmental impacts of the bridge.



Top: The replacement of a bridge superstructure is shown. Bottom: The placement of a precast bent cap is shown.

Solution: Prefabrication minimizes traffic disruptions

Prefabricated bridge construction can help minimize traffic delays and community disruptions by reducing onsite construction time and improving quality, traffic control, and safety.

Using prefabricated bridge elements and systems means that time-consuming formwork construction, curing, and other tasks associated with fabrication can be done off site in a controlled environment without affecting traffic.

Benefits

- Minimizes traffic impacts of bridge construction projects.
- Improves construction zone safety.
- Makes construction less disruptive to the environment.
- Increases quality.
- Reduces life cycle costs.

Successful Applications: More than 11 States are actively pursuing PFBES as a standard practice. The Washington State Department of Transportation, for example, used prefabricated elements to replace 1,189 meters (3,900 feet) of bridge deck on the Lewis and Clark Bridge over a period of 120 nights, with 4 weekend closures and little or no impact on rush-hour traffic. The Virginia Department of Transportation replaced a bridge along Interstate 95 over the James River using prefabricated elements. The project took place over 135 nights, with no road closures during rush-hour traffic. Both of these projects were not just completed faster, but also came in under budget, at a price lower than the engineer's estimate.

Deployment Statement

Using PFBES reduces traffic and environmental impacts by minimizing the need for lane closures, detours, and the use of narrow lanes.

Deployment Goal

By 2008, PFBES technology will be used on a regular basis in 34 States.

Deployment Status

Three States have built 20 or more PFBES bridges, including New York, Texas, and Washington State. An additional eight States, including Alabama, Connecticut, Florida, Illinois, Indiana, New Jersey, Pennsylvania, and Virginia, are actively pursuing PFBES as a standard practice. Other states also are moving toward this technology.

Additional Resources

Visit the Federal Highway Administration's (FHWA) PFBES Web site at **http://www.fhwa.dot.gov/bridge/prefab**.

To learn more about AASHTO-TIG's approved technologies, visit **http://tig.transportation.org**.

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