

THE DISPUTE RESOLVER

Articles on Construction Litigation & Dispute Resolution by Division 1 of the ABA Forum on Construction Law

Monday, December 2, 2024

America's Bridges and the Need for Bridge Infrastructure Investment



During the October 2024 meeting of the American Bar Association's Forum on Construction held in Pittsburgh, a city of many bridges, the importance of bridges to our nation's transportation infrastructure was apparent. Just two years ago, the Forbes Avenue bridge in Pittsburgh collapsed—resulting in several vehicles and a bus falling into a ravine. Ten people were injured in the event. It was later reported that the bridge had received a "poor" rating but was still permitted to remain open to traffic. The event resulted in several lawsuits which, just this past September, the City of Pittsburgh requested \$500,000 from the city council to settle. The Forbes Avenue bridge is hardly a unique case and is just one example of the litigation that can ensue if we fail to maintain our aging infrastructure.

The State of Our Nation's Bridges

As of June 2024, the United States has more than 616,000 bridges located on public roads, including interstate highways, U.S. highways, state and county roads, as well as publicly accessible bridges on federal and tribal lands.

However, according to the American Society of Civil Engineers' most recent bridge infrastructure report card released in 2021, 42% of all U.S. bridges are at least 50 years old, and 46,154, or 7.5%, of the nation's bridges are considered structurally deficient, meaning the bridges are in "poor" condition. As ranked by the National Bridge Inventory, bridges are assigned numerical ratings based upon the conditions of a bridge's roadway and structural components. A rating of seven or higher means that the bridge is in "good" condition, a rating of a five or six means that the bridge is in "fair" condition and a rating of four or less means that the bridge is in "poor" condition. A bridge is given an overall rating of "poor" if any of the bridge structural components is found to be in poor condition which is weighted by the bridge's roadway or deck area and annual daily traffic. In the U.S., 178 million trips are made across structurally deficient bridges every day.

In recent years, as the average age of America's bridges increases to 44 years, the number of bridges classified as poor based on unweighted bridge count has continued to slowly decline based upon the nation's investment in its bridge infrastructure from 10.1% in 2008 to 7.6% in 2018. However, the rate of improvements has slowed and substantial prolonged investment is required to maintain, improve and rebuild our nation's bridges.

A recent estimate of the nation's backlog of bridge rehabilitation investment is \$191 billion and that annual spending on bridge rehabilitation needs to increase by 58% or from \$14.4 billion annually to \$22.7 billion annually to improve the backlog. At the current rate of investment, it will take until 2071 to make all of the bridge repairs that are currently necessary. At the current rates of aging and replacement, almost half of the nation's bridges will require major structural investments within the next 15 years.

Accelerated Bridge Construction

As the rehabilitation and repair of the nation's aging bridges continues to be a priority, the Federal Highway Administration (FHWA) has been at the forefront of promoting the use of accelerated bridge construction techniques and pre-fabricated bridge elements in bridge rehabilitation and construction projects. Accelerated bridge construction (ABC), or "rapid bridge replacement," is a bridge construction process that relies on advanced technology, project planning and design, innovative materials, smarter procurement, and new construction methods to reduce the time and effort it takes to replace or rehabilitate bridges.

As a result, state departments of transportation have begun to turn to accelerated bridge construction as a solution for upgrading substandard bridges. State departments of transportation have used ABC techniques to reduce total bridge construction delivery time, realize cost savings, reduce closure time, minimize loss of toll revenues, improve the durability of bridge elements, reduce traffic impacts and long detours, minimize costly use of temporary

structures and remote site locations, reduce onsite construction time and weather-related time delays, diminish impacts to the traveling public and road workers to construction work zones and decrease environmental impacts.

Some Best Practices in Accelerated Bridge Construction

Since bridges constructed using ABC methods use prefabricated components built offsite, including utility components, decks, piers, columns, foundations and piles, the number of various prefabricated components should be kept to a minimum. The prefabricated components should also be repetitive for the same project and relatively easy to transport and install. Early engagement of third-party stakeholders, including railroads, utility companies, and the traveling public, is necessary to create open communications and information sharing that will help influence the aggressive project schedule for an ABC project. Stringent quality assurance procedures should be implemented and stress monitoring should be used to monitor bridge movement during installation. Prequalified list of materials and products should be maintained for incorporation into ABC projects. Certified fabrication plants and certified contractors should be used for fabrication and installation of bridge elements. In addition, due to the accelerated pace of construction, processes should be implemented to reduce worker fatigue including rotation of shifts, increased crew size, and frequent breaks.

Accelerated Bridge Construction "Slide-In" Bridge 3D Animation

Slide-in bridge construction or "lateral slide" is an ABC technology promoted by the [FHWA Every Day Counts](#) program. The program is an initiative undertaken by the FHWA to bring new technologies to infrastructure construction driven by the desire to reduce impacts to the traveling public. The rehabilitation of a bridge using lateral slide technology is effectively demonstrated in the 3D animation produced by the Pennsylvania Turnpike Authority entitled "[How Accelerated Bridge Construction works on the PA Turnpike.](#)"

Conclusion

As our nation's bridge infrastructure continues to age and deteriorate, substantial additional federal and state investment in building, repairing and modernizing our nation's bridges is required to ensure America's bridges are safe and operational, meet current and future traveler needs, support local economies and strengthen supply chains. The Bipartisan Infrastructure Law, which established the Bridge Investment Program, dedicates \$40 billion over five years to tackle the backlog of bridge projects. Under the program, more than 11,000 bridges are being rebuilt, repaired or modernized. As of October 2024, the Bridge Investment Program has invested \$8.1 billion into 100 bridge projects in 44 states across the country and an additional \$21 billion in dedicated bridge formula funds used to distribute funding to states for highway bridge repairs and upgrades. Given the bridge repair backlog of \$191 billion, additional substantial and long term federal and state investment is required to maintain the integrity of the nation's bridges.

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Sources:

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[American Society of Civil Engineers' Bridge Infrastructure Report Card \(2021\)](#)

[Accelerated Construction – Construction Strategies – FHWA Work Zone](#)

[Delivery Methods for Accelerated Bridge Construction Projects: Case Studies and Consensus Building \(March 2020\)](#)

[Accelerated Bridge Construction: Best Practices and Techniques](#)

[Bridge Formula Program \(BFP\) Questions and Answers](#)

[INVESTING IN AMERICA: Biden-Harris Administration Announces Nearly \\$635 Million for 22 Bridge Projects Across the Country](#)