



Accelerated Construction and Rapid Response

by M. Myint Lwin

The vision of the Federal Highway Administration (FHWA) is to improve transportation for a strong America. In support of this vision, the FHWA's bridge community is dedicated to working with national and international partners in the areas of research, deployment, and education with innovative technologies to provide safe, durable, and strong bridges.

There are about 600,000 bridges on the public roads in the United States. The average age of these bridges is about 43 years. These bridges represent a sizable investment of resources. Many of these bridges are in need of rehabilitation, widening, or replacement. New bridges are being added to the inventory. It is vitally important for us to protect, maintain, and preserve the aging population of bridges and to achieve durability in new construction. We need innovative techniques, strategies, and technologies in modern construction to improve quality in construction, reduce traffic congestion, improve work-zone safety, and achieve economy.

Accelerated bridge construction (ABC) is an innovative technology to reduce construction time on highway projects, improve construction quality and work-zone safety, and reduce adverse impacts on the traveling public. ABC uses prefabricated systems extensively to ensure quality in the constructed projects, minimize on-site disruption to traffic, and improve safety in the work zone. Prefabricated elements for the substructure and superstructure and complete bridge systems for rapid replacement are available and have been used for several years. Prefabricated systems allow bridges to be built in days or weeks rather than months or years.

In 1995, the George P. Coleman Bridge in Virginia, the largest double-swing bridge in the United States was dismantled and replaced in only 9 days using barges. In 2006, the Florida

Department of Transportation used self-propelled modular transporters (SPMTs) to remove and replace a bridge superstructure in northeast Orlando as described in the article in this issue by Mary Lou Ralls.

ABC has been deployed effectively in rapid response to bridges damaged or destroyed by over-height vehicles, ship collisions, and natural disasters, such as hurricanes, earthquakes, and floods. In 2006, the Louisiana Department of Transportation and Development removed and replaced the superstructure of the eastbound and westbound I-10 bridges in Rayne in a few hours using SPMTs. The bridge damage was by an over-height truck.

'Accelerated bridge construction can help build bridges safer, faster, and better.'

In 1999, the Transportation Research Board formed Task Force A5T60 to promote accelerated construction in the highway infrastructure. The task force uses a process called Accelerated Construction Technology Transfer (ACTT) with the aim of reducing construction time, dramatically saving money, and improving safety and quality by minimizing delays and hazards associated with work zones. In 2002, the task force completed two very successful ACTT workshops. Since then, FHWA in collaboration with the AASHTO Technology Implementation Group continues the effort and conducts workshops in various states. The ACTT process begins with a 2- to 2½-day workshop in which a multidisciplinary team of 20 to 30 national transportation experts works with an equal or greater number of their local counterparts to

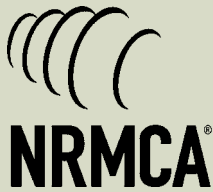
evaluate all aspects of a project and develop recommendations for reducing construction time and enhancing safety and quality.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: Legacy for Users (SAFETEA-LU) establishes the "Highways for LIFE" pilot program with the purpose of promoting innovative technologies and practices for fast construction of efficient and safe highways and bridges, and an "Innovative Bridge Research and Deployment" program with the purpose of promoting innovative designs, materials, and construction methods in the construction, repair, and rehabilitation of bridges. To be eligible to participate in these two programs, states must submit applications to the United States Secretary of Transportation. For details on the application process, visit www.fhwa.dot.gov/hfl and www.fhwa.dot.gov/bridge.

Accelerated bridge construction can help build bridges safer, faster, and better. We must balance speed, quality, and economy to achieve long-lasting and efficient bridges.



U.S. Department of Transportation
Federal Highway Administration



National Ready Mixed Concrete Association

Founded in 1930, the National Ready Mixed Concrete Association (NRMCA) is the leading advocate for the industry. Our mission is to provide exceptional value for our members by responsibly representing and serving the entire ready mixed concrete industry through leadership, promotion, education, and partnering.

NRMCA works in conjunction with state associations on issues such as quality, business excellence, promotion, and regulatory concerns. We strive for constant communication on the latest information, products, services, and programs to help our members expand their markets, improve their operations, and be their voice in Washington, D.C.

NRMCA offers certifications for both ready mixed concrete production facilities and personnel. Certified producers strive to provide the highest quality ready mixed concrete in the safest and most efficient ways possible.

NRMCA is a principal sponsor of CONEXPO-CON/AGG. This show features over 1.5 million square feet of exhibits including an information technology pavilion and an emphasis on live demonstrations throughout the exhibit areas. The show brings together contractors, producers, and equipment manufacturers at the largest exposition in the Western Hemisphere for the construction industry.

NRMCA is also the principal sponsor of the Concrete Technology Forum, an annual symposium on state-of-the-art concrete technologies. The Forum brings researchers and practitioners together to discuss the latest advances, technical knowledge, continuing research, tools, and solutions for ready mixed concrete.

For more information, contact the National Ready Mixed Concrete Association, 900 Spring Street, Silver Spring, MD 20910 888-84NRMCA (888) 846-7622; www.nrmca.org.



Silica Fume Association

The Silica Fume Association (SFA), a not-for-profit corporation based in Delaware, with offices in Virginia and Ohio, was formed in 1998 to assist the producers of silica fume in promoting its usage in concrete. Silica fume, a by-product of silicon and ferro-silicon metal production, is a highly-reactive pozzolan and a key ingredient in high performance concrete, dramatically increasing the service-life of structures.

The SFA advances the use of silica fume in the nation's concrete infrastructure and works to increase the awareness and understanding of silica fume concrete in the private civil engineering sector, among state transportation officials and in the academic community. The SFA's goals are two-fold: to provide a legacy of durable concrete structures and to decrease silica fume volume in the national waste stream.

Some of the recent projects completed by the SFA, under a cooperative agreement with the Federal Highway Administration (FHWA), include:

- The publication of a *Silica Fume User's Manual*—the manual is a comprehensive guide for specifiers, ready mixed and precast concrete producers, and contractors that describes the best practice for the successful use of silica fume in the production of high performance concrete (HPC).
- The introduction of a Standard Reference Material (SRM)[®] 2696 Silica Fume for checking the accuracy of existing laboratory practices and to provide a tool for instrument calibration. This SRM is available from the National Institute of Standards and Technology (NIST).

A much anticipated research program nearing completion by the SFA is the testing of in-place silica fume concrete under service conditions. At the conclusion of this research the results will demonstrate the benefit of silica fume concrete's unparalleled long-term performance. For more information about SFA, visit www.silicafume.org.