Learn More About FHWA's Office of Infrastructure Research and Development

The Federal Highway Administration (FHWA) Office of Infrastructure Research and Development works with agencies across the Nation and with international partners to strengthen the transportation infrastructure in the United States. Some of our recent research initiatives and products are highlighted in this document.

Building Information Modeling (BIM) for Infrastructure

Through BIM for Infrastructure, FHWA is advancing digital transformations in delivering highway projects and leveraging enterprise data for better decisionmaking.(1) Foundational work, including a National BIM Roadmap and BIM Global Benchmarking Study, has led to more than 20 States participating in a Transportation Pooled Fund (TPF) study.(2,3) This study includes Building Information Modeling (BIM) for Bridges and Structures and "Building Information Modeling (BIM) for Infrastructure."(4,5) TPF projects are cofunded by member organizations and help ensure States are moving forward in a coordinated effort. Agencies outside the United States may also participate in the TPF program.(6)

Structural Analysis of Pavement Without Lane Closures

FHWA is working with State departments of transportation (DOTs) on applying traffic speed deflection testing technology to pavement structural assessment. FHWA has developed analysis methods for this structural analysis technology and demonstrated its value in evaluating the structural condition of pavement at the network level.(7) FHWA, along with 26 States, is participating in a TPF study in which agencies are using and demonstrating data collection technologies to assess and test State pavement sections.(8) Additionally, agencies are developing guidelines on how to use the data collected in case study webinars.

FHWA InfoHighway™

FHWA InfoHighway provides access to highway infrastructure engineering research data in a single location. Currently, the website includes four web portals: InfoPave™ (analysis of long-term pavement performance (LTPP)), InfoBridge™ (access to performance related bridge information), InfoMaterials™ (infrastructure research and data), and InfoTechnology™ (technical knowledge dissemination on nondestructive evaluation technologies).(9)

LTPP Program Report

The report titled *The Long-Term Pavement Performance Program* is a treasure trove of information about pavements and their performances. The report details how the FHWA's LTPP Program was strategically conceived, initiated, and carried out. FHWA's LTPP Program was established in the 1980s to systematically collect pavement performance data. Since then, LTPP studies have tracked the performance of more than 2,500 pavement test sections located throughout the United States and Canada—in some cases, observing the same pavement for more than 20 yr.(10)

Ultra-High Performance Concrete (UHPC) Research

Through UHPC research, FHWA is opening doors to new ways to design, build, and rehabilitate highway-related structures. FHWA's UHPC research is advancing novel solutions to accelerate bridge construction, rehabilitate deteriorated bridge decks, and facilitate structural design.(11)

Deep Foundation Load Test Database (DLFTD) Version 2.0

FHWA's DFLTD version 2.0 is a centralized data repository of soil and load test information with the principal goal of optimizing the design, construction, and maintenance of bridge foundations and other highway infrastructure. DFLTD version 2.0 includes more than 2,500 soil tests and more than 1,600 load tests on various types of piles and drilled shafts in different soil conditions.(12)

Geosynthetic Reinforced Soil (GRS) Integrated Bridge System (IBS) Report

FHWA developed the GRS IBS as a fast, cost effective method of bridge support. The report titled *Design and Construction Guidelines for Geosynthetic Reinforced Soil Abutments and Integrated Bridge Systems* outlines state-of-the-art recommended best practices for designing and constructing GRS technology for the application of abutments and the IBS.(13)

Alkali-Silica Reaction (ASR) Susceptibility in Concrete Mixture Report

The Chemistry Laboratory at Turner-Fairbank Highway Research Center (TFHRC) is conducting research directed toward developing new, reliable, and efficient guidelines for management of ASR, one of the main deterioration mechanisms affecting concrete infrastructure in the United States.[14] According to the report titled *A Novel Approach for the Assessment of ASR Susceptibility of Concrete Mixtures in Airfield Pavements and Infrastructure*, researchers conducted thorough, fundamental research to develop an innovative reactivity index based on pore solution chemistry. The index can be applied to detect ASR reactive phases in aggregates, determine the safe limit of alkali loading of a concrete mix prepared using specific aggregates below which ASR will not occur, and evaluate ASR susceptibilities of job mix designs.[15]

Concrete Laboratory

The Concrete Laboratory at TFHRC is investigating aspects of sustainability, performance engineered mixtures, repair materials, durability, and UHPC.[16] While many advances have been made in the past two centuries in understanding cement and concrete chemistry, microstructure, and property development, FHWA's research addresses many of the questions lingering in the cement and concrete industries that affect the state of practice.

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