

RESEARCH & TECHNOLOGY TRANSPORTER

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U. S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

OPERATIONS

5-1-1: An Historic First Telephone Call

Federal Highway Administration Deputy Executive Director Vincent F. Schimmoller joined Kentucky Gov. Paul E. Patton, Kentucky Transportation Secretary James Codell, and David Hensing, interim President of the Intelligent Transportation Society of America on June 11 to place the nation's historic first telephone call to 5-1-1—America's Traveler Information Telephone Number.

The U.S. Department of Transportation (U.S. DOT) petitioned the Federal Communications Commission (FCC) in March 1999 to designate a national three-digit telephone number for traveler information. Seventeen State DOTs, 32 transit operators, and 23 Metropolitan Planning Organizations and local agencies, among others, formally supported this petition. On July 21, 2000, FCC granted DOT's request. FCC chose 5-1-1. FCC's announcement noted that DOT "expects that the widespread use of the 5-1-1 dialing code will [reduce] congestion and pollution on our nation's roads, lower fuel consumption, provide superior traffic management, enhance roadway safety, and enable the public to make wise travel decisions."



FHWA Deputy Executive Director Vincent F. Schimmoller, Kentucky Governor Paul E. Patton, and Kentucky Transportation Secretary James Codell at the ARTIMIS center during the first 5-1-1 ceremonial call activities.

On the same day, then-Secretary of Transportation Rodney Slater announced a program that would provide grants of up to \$50,000 for States and local jurisdictions to convert existing travel information numbers to 5-1-1. Slater called the FCC decision a "visionary, landmark action that will change the way America travels into the 21st century." He added that "5-1-1's delivery of travel information to virtually every American will provide choices in our professional and personal lives that will save lives, time, and money."

The Cincinnati-Northern Kentucky metro area is the first region in the country to adopt the national dialing code. It is expected that this service will be available throughout the U.S. in the next several years. This will standardize the telephone number a traveler will call whereas now there are several hundred different numbers. U.S. DOT is working with a coalition of public and private groups to facilitate national implementation of 5-1-1.
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The *Research and Technology Transporter* communicates FHWA research, development, and technology accomplishments, findings, information, and technology transfer opportunities. Its audience is transportation engineers and professionals in State and local highway agencies, State DOTs, Local Technical Assistance Programs, Divisions, Resource Centers, Core Business Units, academia, and the research community. The eight-page newsletter is published monthly by FHWA's RD&T service business unit. Editorial offices are housed at the Turner-Fairbank Highway Research Center. Comments should be sent to the managing editor at the address below. Field offices are encouraged to submit articles for publication via the appropriate agency technology leader from the editorial board listed below. The newsletter can be viewed online at www.tfhrc.gov. Subscriptions to the *Transporter* are free. Send your request to Judy Dakin at the address below, or send email to judy.dakin@fhwa.dot.gov.

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Multi-state Transportation Issues Are Getting Some Much Needed Attention

In recent years, there has been a growing interest in multi-state transportation issues. Congress identified 18 high priority National Highway System (NHS) corridors in the Intermodal Surface Transportation Efficiency Act (ISTEA). Since then, more and more corridors have been added to the statutory list which now includes 43 corridors, most of which are multi-state. There are several reasons for focusing on these multi-state corridors but the principal one is the passage of the North American Free Trade Agreement, commonly known as NAFTA. By reducing tariffs and other restrictions, trade between the United States and Canada and Mexico has mushroomed. This has led to bi-national planning efforts on both borders to find new ways of reducing the traffic bottlenecks at border crossings that have accompanied the growing trade. Several States have also banded together to identify the principal corridors leading to the major border crossings.

But NAFTA is just one manifestation of the globalization of the world economy. In 1996, the Southeastern States joined together to initiate the Latin American Trade and Transportation Study (LATTs), which analyzes the impacts of the explosive growth in trade between the United States and the entire Latin American region, which is now our number one trading partner.

A highlight in the history of multi-state projects was the Fiscal

Year 1999 awards for the National Corridor Planning and Development and the Coordinated Border Infrastructure discretionary program. That year, 11 applications were submitted for multi-state projects and all were selected, despite the overwhelming number of projects that they were competing against.

Although trade is a primary element driving many of these efforts, others have focused on economic development. One of the earliest attempts to improve the economy of an economically depressed region was the Appalachian Highway System. Started more than 35 years ago, it is probably the best example of a sustained effort of using transportation for economic development. Last year, Congress created the Mississippi Delta Authority, which will try to revive the economies of that region.

Multi-state efforts have also focused on improving inter-city passenger flows. A surge in airline travel has led to increased ground-traffic congestion near airports, overcrowded airports, and frequent flight delays. One solution being studied is high-speed rail service, particularly for trips under 500 miles. Upgrading service in the Boston to Washington market has been underway for the past 30 years. Other areas are also contemplating high-speed rail service, particularly in the Midwest and along the Pacific coast. By 1998 the number of designated high-speed corridors

had increased to 11.

Further, Intelligent Transportation Systems (ITS) require multi-state cooperation if they are to become truly effective. A national conference on multi-state/jurisdictional

transportation issues, which was sponsored by FHWA, the Transportation Research Board (TRB), and the I-95 Corridor Coalition, was held in Arlington, VA, on June 18 and 19, 2001, to explore the various institutional

arrangements that are used to carry out these studies and to explore the mechanism for implementing the proposed plans.

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PROFESSIONAL DEVELOPMENT

Washer Wins Prestigious Flemming Award

On June 5, Glenn A. Washer, Ph.D., research structural engineer and manager of FHWA's Nondestructive Evaluation (NDE) Validation Center at the Turner-Fairbank Highway Research Center (TFHRC) in McLean, VA, was awarded an Arthur S. Flemming Award for Applied Science at George Washington University in Washington, D.C., The Flemming Award Program honors outstanding men and women who have made extraordinary contributions to the Federal government. The award winners must have from 3 to 15 years of government experience, and they are selected from all areas of Federal service. This year, four winners in each of three categories—administration, applied science, and science—will receive Flemming Awards.

The program is named for Dr. Arthur Sherwood Flemming, whose exemplary career spanned seven decades of service to the Federal government and higher education. Among other things on his long resume, Flemming served as president of three universities and as secretary of the U.S. Department of Health, Education, and Welfare. In 1994, President Clinton awarded to

Flemming, who passed away in September 1996, the Medal of Freedom in recognition of his peerless dedication to his country.

The first Flemming Awards were presented in 1948 by the Downtown Jaycees of Washington, D.C. Since 1998, George Washington University has administered the program. Previous recipients include Daniel Patrick Moynihan and Elizabeth Dole.

Washer has worked for FHWA since 1990. In 1992, he became a research structural engineer at TFHRC, and he has led the development of the Nondestructive Evaluation Validation Center (NDEVC) since it was first proposed in 1996 under a congressionally mandated \$3 million initiative. NDEVC is a national center for the development and evaluation of NDE technologies for highway bridges.

Since the center was opened in 1998, it has had tremendous success in providing service to State transportation agencies. New tools have been developed to accurately determine the load-carrying capacity of existing bridges, to detect cracks in steel bridges that

could lead to structural collapse, and to evaluate the internal condition of concrete structures. The national impact of the NDEVC can be measured in the participation of State highway agencies in the activities of the center; 49 states have participated in the activities to date.

Washer's professional achievements and contributions are particularly noteworthy because all at the same time he managed to excel at work; go to graduate school; be an exemplary husband and father to five children; and serve as chairman, co-chairman, or member of several professional committees.

In particular, Washer is very active in the American Society for Nondestructive Testing (ASNT). He is a Research Committee member, chairman of the ASNT Infrastructure Committee, conference co-chairman for the 2001 Research Symposium, and infrastructure liaison for the Handbook Development Committee.

Washer recently received his doctorate in materials science and engineering from Johns Hopkins University in Baltimore, MD.

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Career Day Provides Opportunity for Children to Learn About Engineering

Presenting at Career Day provides a challenge for seasoned transportation personnel who want to share their expertise and enthusiasm with grade school students. Making simple concepts sound complicated is easy; making the complicated simple takes creativity. One FHWA engineer was up for the challenge and took on 60 3rd through 5th graders at Concord Elementary School in Prince George's County, Maryland. Deborah Curtis, a highway operations research engineer at FHWA's Turner-Fairbank Highway Research Facility (TFHRC), engaged the students in helping define "engineering" through practical, everyday events and devices.

Ms. Curtis distributed a random assortment of supposedly unrelated items to the students for their examination. She asked them to look for common links among the articles, which included such dissimilar items as a television remote control, a Slinky toy, an English book, a video game, an engineer's scale, and a traffic signal. Students proposed interesting associations, but the true link was that they were practical items that engineers used in their



Deborah Curtis explains how engineers use common items in their work every day.

work every day. The advanced technologies involved in common household items were tied to engineering applications, like traffic control devices. The engineer's scale was used for bringing big projects down to workable sizes; the English book stressed the need for engineers to be skilled beyond science and math, and be able to communicate their innovations to those who need them.

The Career Day students learned about many careers that day, from television broadcaster to undertaker. They also learned from

FHWA, as part of a DOT-Garrett A. Morgan Technology and Transportation Futures outreach effort, that engineering is a dynamic career. Engineers have backgrounds in science and math, but get their ideas and inspiration from working and talking with people from a variety of other backgrounds and experience. They learned that engineering has applications that reach into each of their lives, and that it's a practical and attainable career for each student.

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Transportation—It Keeps America Moving

Rockets flying through space, helicopters circling the ocean, covered wagons, submarines, trucks, and school buses all pulling America ahead. This is the incredibly creative image created by Sean Goldinger to capture the theme “Transportation—It Keeps America Moving.”

Sean, from New Cumberland, PA, took first place in the National Transportation Week (NTW) Poster Contest. He was honored during an FAA-sponsored NTW celebration at Potomac Airfield in Ft. Washington, MD. Doug Bernard, director of Government Relations for Quixote Transportation Safety, sponsor of the contest, presented a \$200 savings bond and a plaque to the Hillside Elementary School 5th grader. The school received a \$500 check. Joining the celebration were Sean’s parents, brother, sister, and grandmother.

Second place, submitted by Jared Soeda, of PS/IS 187 in New York City, with the title of Transportation, shows North America on a globe, with depictions of a truck, ship, bus, auto, rocket, and plane. Jared received a \$100 savings bond, his school a \$200 check.

The third place award went to Brittany Oliver, Baranoff Elementary School, Austin, TX. Her poster shows highways, interchanges, and bridges with cars, trucks, buses, and a motorcycle, as well as an airplane in the sky. Brittany incorporated her school in the picture. Brittany’s entry earned her a \$100 savings bond and \$100 for her school.

NTW provides an opportunity to carry the message of transportation careers to students, teachers, and



Hillside Elementary School 5th Grader Sean Goldinger's poster took first place in the NTW Poster Contest.

parents. A major objective of NTW is to interest more young people in transportation and the poster contest helped promote this idea. The contest, open to 5th graders, received over 150 entries from students across the country.

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ENVIRONMENT AND PLANNING

Seeds for the Future Conference

From April 18–20, 2001, FHWA partnered with the Florida Department of Transportation (DOT), the University of Florida, and the Florida Federation of Garden Clubs, Inc., to explore the demand for native wildflower and native grass seed production in the United States.

At this time the demand by Federal, State, and local agencies outweighs the supply of native seed for revegetation,

restoration, wetland mitigation, and erosion control work. These efforts are important to State DOTs across the country. Potential growers heard about more than a million dollars set aside by the Bureau of Land Management for native seed. Farmers looking for alternative crops listened to experienced growers who shared trade secrets. Established growers fine-tuning their market niche listened to how various States are establishing seed standards and

testing of native seed.

Attendees were buzzing with newfound connections and technology transfer. Many attendees expressed the desire for a follow-up conference. FHWA helped connect the need for native seed by the public sector with private sector growers from around the nation.

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New Editions of FHWA Primary References on Stream Stability, Scour, and Countermeasures Distributed

In May, FHWA distributed a new set of scour publications. The new editions of FHWA's primary hydraulics publications pertaining to scour, stream stability, and countermeasures included: Hydraulic Engineering Circular (HEC) 18, "Evaluating Scour at Bridges," fourth edition; HEC 20, "Stream Stability at Highway Structures," third edition; and HEC 23, "Bridge Scour and Stream Instability Countermeasures," second edition.

Two sets of the new HECs were sent to each State Department of Transportation (DOT). The new editions of these publications were made possible by the joint efforts of FHWA's Office of Bridge Technology, Office of Infrastructure Research and Development, Resource Centers, and the National Highway Institute (NHI); the United States Geological Survey; consultants; and academia.

Advances in technology obtained through research and two scanning tours have been implemented in the new HECs. These HECs have been converted to dual units and example problems have been added to the major technical topics of each publication. Highlights of these editions are:

- HEC 18—The fourth edition has been reorganized by topic. New procedures are added for estimating: pier scour in coarse streambed material; scour on complex pier foundations; and pressure-flow scour. Guidance is included for developing a plan of

action for a scour critical bridge and for evaluating scour in cohesive soils and in rock formations. The riprap countermeasure section for piers and abutments has been moved to HEC 23 and converted to a design guideline so that all scour countermeasures are consolidated and are in consistent format.

- HEC 20—The third edition includes: new guidance on stream reconnaissance, classification, and response; a rapid stream stability assessment method; quantitative analyses techniques for estimating lateral and vertical stability; channel restoration concepts; and geotechnical considerations for bank stability. The countermeasure sections on stream stability presented in former Chapters 5 and 6 were moved to Chapters 3 through 6 of HEC 23 to expand selection and design guidance on stream stability countermeasures.
- HEC 23—The second edition is now the primary reference for countermeasure selection and design. New material includes: strategies for developing a plan of action for a scour critical bridge; techniques for estimating scour at transverse and longitudinal structures; biotechnical engineering countermeasures; and guidance for scour instrumentation and monitoring (from the former FHWA Demonstration Project 97). Detailed design guidelines



The new HECs are posted on the Office of Bridge Technology's Web site.

for 12 countermeasures are presented in the second edition.

The new editions of HECs 18, 20, and 23 will be provided to participants of the NHI course 135046, "Stream Stability and Scour at Highway Bridges." The new material added to HECs 18 and 20 will be integrated into the revised NHI course 135046, which is scheduled for completion in Spring 2002.

HEC 23 will be the resource manual for a new NHI Course, 135048, "Countermeasure Design for Bridge Scour and Stream Instability," which should also be available in Spring 2002. These HECs are posted on the Office of Bridge Technology's Web site and are available for downloading at www.fhwa.dot.gov/bridge/hydpub.htm. For more information, please contact Sterling Jones at (202) 493-3043 or sterling.jones@fhwa.dot.gov; Dr. Larry Arnesen at (303) 716-2144 or larry.arnesen@fhwa.dot.gov; or **Jorge Pagán-Ortiz** (202) 366-4604 jorge.pagan@fhwa.dot.gov

INTERNATIONAL

New Publications Released by the Office of International Programs

FHWA's Office of International Programs has just released two new publications. The first, *Performance of Concrete Segmental and Cable-Stayed Bridges in Europe*, is the final report of an international technology scanning tour that evaluated the European inventory of prestressed concrete segmental and cable-stayed bridges. The team consisted of Federal, State, and private sector representatives. They visited Denmark, France, Germany, and Switzerland, as well as meeting with representatives from Norway and the United Kingdom.

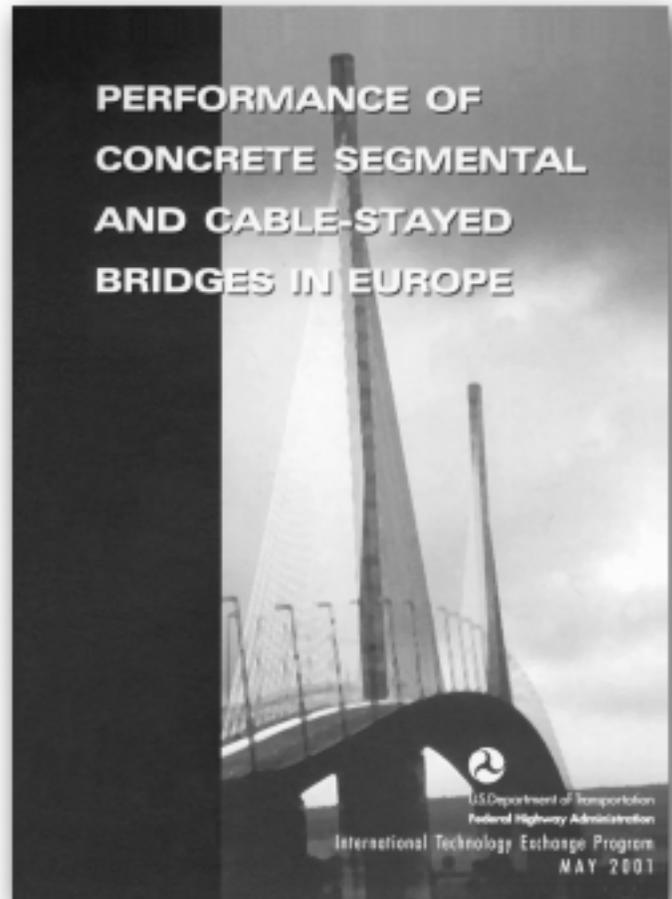
On average, European structures are a decade or two older than similar ones in the United States. The team found that, in general, segmental and cable-stay technology and developments in Europe and the United States are moving in parallel directions. Early performance problems from the 1960s and 1970s have been eliminated through new codes and practices on both sides of the Atlantic. Technical advances continue to be made with respect to corrosion, external and internal prestressing tendons, inspection methods, use of new composite materials, and construction techniques.

The second publication, *Geometric Design Practices for European Roads*, is the final report of an international technology scanning tour that conducted a broad overview of geometric and context-sensitive

design practices in Europe. The team consisted of Federal, State, local government transportation, and academic representatives. They visited sites in Denmark, Germany, the Netherlands, Sweden, and the United Kingdom, and met with European representatives from transportation and highway ministries, research organizations, and consulting firms.

The team found that the general philosophy for highway design and project development in Europe is to develop a transportation program and system that enhances community values and integrates roads into communities and the environment. This philosophy is supported by very high safety goals.

The U.S. delegation found potentially transferable practices regarding public involvement in



project planning, self-explaining, self-enforcing rural roads, design flexibility, area-wide traffic calming measures, intersection control through roundabouts, and integration of bicyclists and pedestrians.

Both reports are available online at www.international.fhwa.dot.gov, and in hard copy by e-mailing the Office of International Programs at international@fhwa.dot.gov, or by calling (202) 366-9636.

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TECHNOLOGY TRANSFER

HIPERPAV Used in DTU Course

An FHWA-developed software package HIPERPAV (developed for predicting early-age cracking in concrete pavements) was used in the “Behavior and Performance of Early Age Concrete” course held at the Technical University of Denmark (DTU) from June 17–23, 2001, in Lyngby, Denmark.

The course consisted of lectures and hands-on laboratory experiments, which covered theory, measurement, and modeling of the following main subjects:

- Development of microstructure
- Evolution of solid behavior

- Porosity and moisture movement
- Strength, stiffness, and creep
- Cracking tendency
- Fracture mechanics of concrete
- Effects of curing conditions
- Laboratory methods for early age

FHWA’s HIPERPAV software was used in several course segments, including Practical Models for Pavement Behavior and the computer lab portion of the course.

The class was a total of approximately 140 hours, including the period of June 17–23 at DTU (lectures and laboratory work), preparatory reading given before the course, and completion of a laboratory report after the course. Lectures were given in the morning and early afternoon, laboratory work took place daily in the afternoons.

The course was free to students due to the generous sponsorship of the Knud Højgaard Foundation.

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