

FOCUS

October
2003

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Project Pegasus: TxDOT Accelerates the Reconstruction of Dallas Interstate

With the population of Dallas, Texas, expected to double over the next 20 years, the Texas Department of Transportation (TxDOT) faces the challenge of providing the transportation infrastructure that will support that growth. Their answer? Project Pegasus. This initiative aims to transform the two major Interstate freeways that serve downtown Dallas, redesigning portions of IH 30 and IH 35E.

As part of an American Association of State Highway and Transportation Officials and Federal Highway Administration (FHWA) initiative known as Accelerated Construction Technology Transfer (ACTT), a workshop was held in Mesquite, Texas, from September 9–11, 2003, to focus on strategies for accelerating the 19.3-km (12-mi) Project Pegasus. The workshop brought together local and national transportation experts from State highway agencies, industry, academia, and FHWA. These experts' skill areas included design, construction, innovative financing, right-of-way, utilities, innovative contracting, the environment, work zone traffic control, and worker safety.

The portions of the IH 30/IH 35E freeways being rebuilt as Project Pegasus are critically congested, with bumper-to-bumper traffic occurring for more than 6 hours a day and traffic speed averaging only 32 km/h (20 mi/h). The traffic problems are exacerbated by the outdated layout of the freeways, which were primarily designed in the 1950s to take travelers to downtown Dallas. Travel patterns

have changed over the decades, however, and today four out of every five drivers remain on the freeways and bypass downtown Dallas. Design standards have also changed over the years: In many locations on the freeways, ramps lack adequate acceleration or deceleration lengths, interchanges and ramps are too close together, and bridges have limited vertical and horizontal clearances, among other problems.

The reconstruction project will add capacity, with plans calling for five to six lanes in each direction and one or two reversible high-occupancy vehicle (HOV) lanes in the median. Operations and safety will also be improved by upgrading to meet today's design standards for freeways, as well as by eliminating left hand merges and diverges.

The goal of the \$760 million Project Pegasus is to complete the reconstruction work in 4 years, versus the original estimate of 7 years. Other goals are to:

- Maintain traffic with minimal disruption.
- Accommodate special events in the region.
- Provide access to emergency facilities.
- Maintain a safe work zone.
- Minimize construction delays due to right-of-way, utilities, and railroad issues.
- Incorporate a context-sensitive design into project plans.

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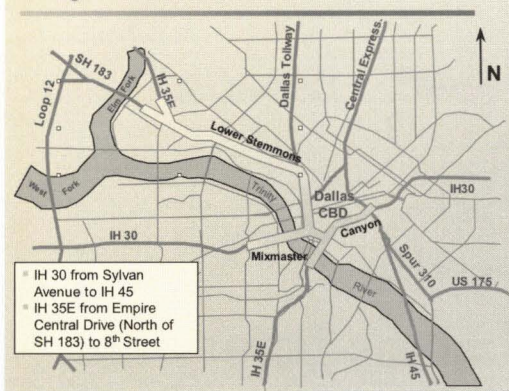


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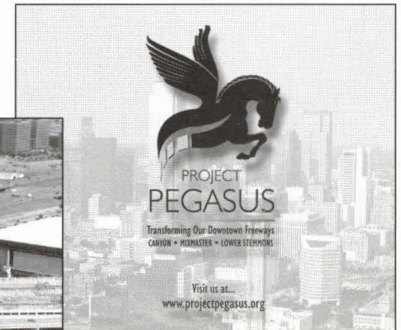
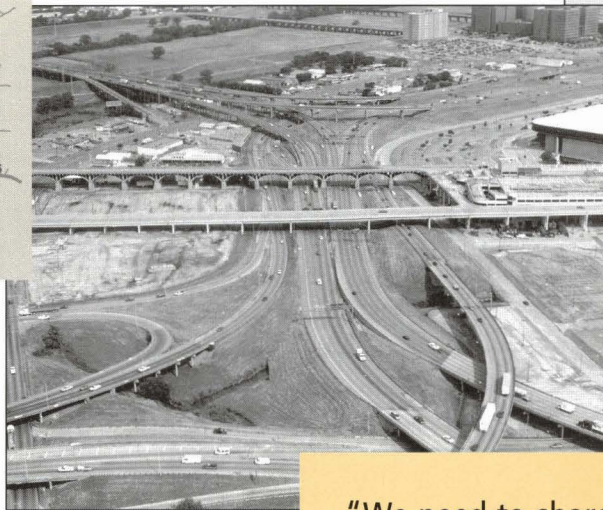
**Federal Highway
Administration**

Project Pegasus, continued from page 1

Project Location



Project Pegasus will transform the two major Interstate freeways that serve downtown Dallas, IH 30 and IH 35E.



Don Lucas of the Heritage Group and chair of the Transportation Research Board (TRB) Committee A5T60, the Task Force on Accelerating Innovation in the Highway Industry, noted that customers are demanding a response to their travel needs. "The momentum is building for change. We need to share innovative practices and processes with each other to create a new picture of how we can perform high-speed construction while maintaining the quality."

"Acceleration is a priority topic for DOTs," added Hal Kassoff of Parsons Brinckerhoff and also a member of the TRB task force.

Tim Nesbitt, project manager for TxDOT, noted that challenges faced by TxDOT in accelerating the project include having to weave construction around railroad tracks, major employment sites, four city parks, the Dealey Plaza historic district, American Airlines Center, and a new proposed stadium site for the Dallas Cowboys.

Workshop participants met in smaller skill set groups to brainstorm issues and ideas and develop recommendations for meeting the project goals and working through the challenges. Recommendations for accelerating the project included using design-build contracting to optimize innovation, coordinating with utility companies early in the project planning process, and using long-life pavements with a 50-year design life. Other recommendations

included employing construction techniques for structures that minimize the traffic impact, such as incremental launching, lateral slide, and heavy lift methods; improving general materials specifications to only allow use of premium materials; using contractor incentives to minimize traffic disruption; and setting up a dedicated incident management system at the project site.

Additional traffic management suggestions included constructing the planned Trinity Parkway west of I-35E prior to this project, so that mainline traffic can be detoured onto the Parkway. This will enable such traffic strategies as total or partial road closure, weekend closures, or restricting road use to HOV vehicles only, to be used. The importance of providing information to the public was emphasized, as workshop participants noted that real-time traveler information should be provided and that project work should be supported by intensive media efforts to let res-

"We need to share innovative practices and processes with each other to create a new picture of how we can perform high-speed construction while maintaining the quality."

idents and the community know about the changes taking place.

The AASHTO/FHWA ACTT team is developing a report on the workshop and will then compile 6-month and 1-year follow-up reports detailing which of the workshop recommendations were implemented and to what extent.

Support for the ACTT initiative is steadily gaining momentum. The next workshop will be hosted by the California Department of Transportation in December. Louisiana, Montana, Oklahoma, and Washington State have all

indicated that they are interested in hosting workshops in 2004, while States such as Georgia, Idaho, Maryland, Massachusetts, Minnesota, New Jersey, and Wisconsin have also expressed interest in the ACTT program.

To learn more about Project Pegasus, contact Brian Barth at TxDOT, 214-320-6189, or visit the project Web site at www.projectpegasus.org. For more information on ACTT or to learn more about hosting a workshop in your State, contact your local FHWA Division Office or Dan Sanayi at FHWA, 202-493-0551 (email: dan.sanayi@fhwa.dot.gov). *

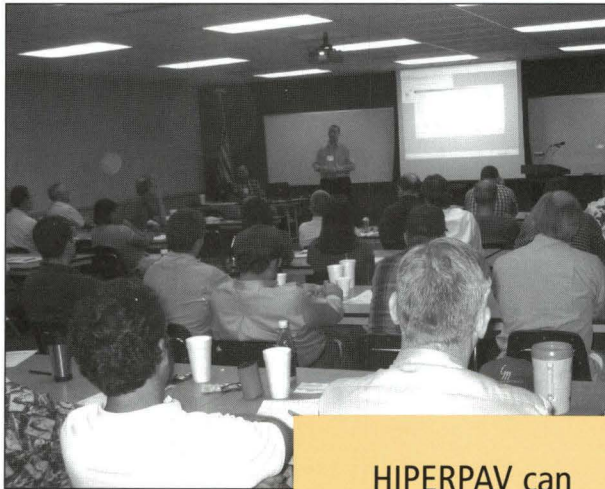
Texas Workshops Highlight High Performance Concrete Paving Software

More than 300 representatives from State and local highway agencies, contractors, and consulting engineering firms in Texas were introduced to the Federal Highway Administration's (FHWA) HIPERPAV (HIGH PERFORMANCE PAVING) software at workshops held this past summer in Dallas, Houston, and San Antonio. Sponsored by the Texas Department of Transportation (TxDOT) and The Cement and Concrete Promotion Council of Texas (CCPC), the workshops looked at "What's Hot in Concrete Paving?" Topics included maturity, quality control, and hot weather paving, as well as the introduction to HIPERPAV. The workshops also featured discussion sessions designed to foster conversations among attendees with extensive experience with concrete paving and those new to the technology.

"The workshop program was developed because of a need to discuss hot weather concrete operations and pavement construction management with TxDOT districts and personnel that are getting more involved in concrete paving," said Robert Lopez, head of CCPC. "The demand has been so great that two workshops were required in Dallas and two in San Antonio to accommodate the high level of interest."

An additional workshop is scheduled for October 30 in San Antonio. Other areas of the State that have requested workshops include Austin, south Texas, and west Texas.

HIPERPAV is a Windows-based software program that provides guidance on the design and construction of concrete pavements and helps users anticipate and prevent pavement performance problems. The software was developed by The Transtec Group, Inc., under an FHWA contract. The program evaluates the potential for uncontrolled cracking in new full-depth jointed concrete pavements. This evaluation considers the impact that



The workshops introduced the HIPERPAV software.

specific construction procedures, mix and pavement designs, and environmental factors might have over the initial period after the pavement is placed.

HIPERPAV has four input screens where a user enters information on a project's construction, environmental, mix, and general design parameters. The program then analyzes the input values using a series of predictions that estimate the amount of stress and strength that will develop in the concrete during the early phase of construction. If the analysis determines that the pavement will be prone to uncontrolled cracking, the user can modify one or more of the job variables and rerun the program until an acceptable combination of factors is reached. Ultimately, HIPERPAV can help highway agencies optimize their pavement designs, improve pavement performance, and cut costs.

A new version of the program, HIPERPAV II, is currently being tested. HIPERPAV II builds on the original's

HIPERPAV can help highway agencies optimize their pavement designs, improve pavement performance, and cut costs.

capabilities by also predicting the cracking behavior of continuously reinforced concrete pavements during the early-age period after pavement placement. This analysis includes the width and spacing of cracks. The new version also provides some information on how the pavement is expected to behave over time, based on the conditions present during construction. In addition, the software will provide capabilities to optimize concrete mix designs to meet specific performance criteria and to predict the early-age behavior of dowel bars in rigid pavements. HIPERPAV II is expected to be ready for release in the spring of 2004.

For more information on the Texas workshops, contact Dan Rozycki at Transtec, 512-451-6233 (email: dan@thetranstecgroup.com). To learn more about HIPERPAV or to obtain a copy of the software, contact Fred Faridazar at FHWA, 202-493-3076 (email: fred.faridazar@fhwa.dot.gov). Information is also available online at www.hiperpav.com or www.tfhr.gov/pavement/pccp/hipemain.htm. *

Awards Honor the Best and Brightest in Highway Quality

Innovations in highway quality from Arizona to New Jersey were honored in September in Minneapolis, Minnesota, at the presentation of the National Partnership for Highway Quality's (NPHQ) 2003 National Achievement Awards. "NPHQ encourages the use of quality practices that will usher in a new era of roadway investment and performance to improve safety and service for highway users," says NPHQ Executive Director Bob Templeton. "It was clear that from design to delivery, the 2003 winners raised the bar in key quality areas."

NPHQ's National Achievement Award went to the New Jersey Department of Transportation (NJDOT), J.H. Reid General Contractor, and Parsons Brinckerhoff-FG, Inc., for their work on the US Route 9 Bridge over Nacote Creek. New Jersey faced the challenge of replacing a deteriorated 76.2-m (250-ft) drawbridge built in 1922 with a new five-span, 152.4-m (500-ft) bridge. The new bridge has a 7.62-m (25-ft) vertical clearance and two new approach roadways. To achieve a high-quality product, NJDOT used the Load and Resistance Factor Design method, as well as high-performance concrete for the

prestressed beams. Nontoxic composite materials were used for the bridge's fender system, which protects the bridge from collisions. "Multiple hallmarks of quality distinguished this project, including stringent internal quality reviews," noted Templeton. "As an outcome, there were only two change orders executed during construction, both the result of unforeseen ground conditions where piles were to be driven."

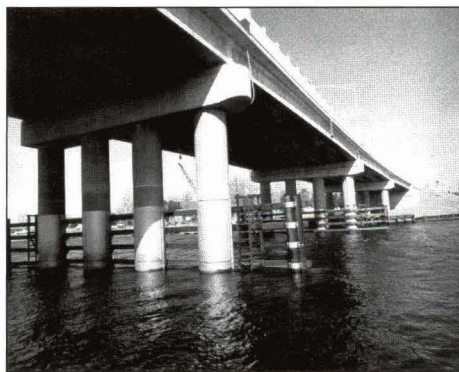
The Michigan Department of Transportation (MDOT), Nagel Construction Company, and the URS Corporation won Special Recognition for a Small Project for the reconstruction of the 28th Street at Broadmoor Avenue intersection in Grand Rapids and Kentwood. This intersection ranks as one of the most congested in West Michigan, with 85,000 vehicles using it daily. Careful planning was required to limit the project's impact on traffic flow and the many shopping centers and other businesses in the area. MDOT worked closely with

all the stakeholders on designing a project staging plan, studying area utility lines, and planning alternative routes,

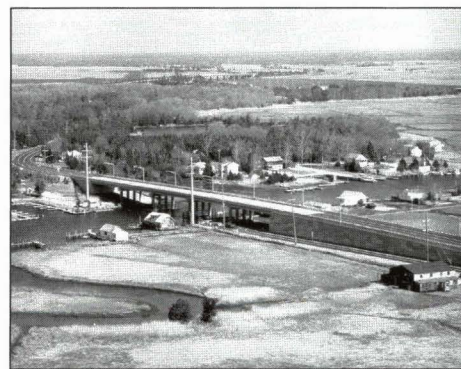
among other tasks. An accelerated construction schedule included 20-hour work days, 6 days a week. The project came in at \$154,000 under budget and opened to traffic 12 days ahead of schedule. "The team worked around the clock to get the work done well and as efficiently as possible," said Suzette Peplinski, manager of MDOT's Transportation Service Center in Grand Rapids.

Special Recognition for a Structure Project was awarded to the Texas Department of Transportation (TxDOT) and Williams Brothers Construction Company for their US 59-Southwest Freeway initiative, known as the Houston Gateway. The project widened nearly a mile of the below-grade freeway, which runs to and from downtown Houston and has an average daily traffic count of 241,000 vehicles. As part of the project, four bridges spanning the freeway had to be replaced. The steel for new tied-arch bridges was constructed in place over the existing bridges and then each old bridge was demolished using controlled explosions on five separate weekends.

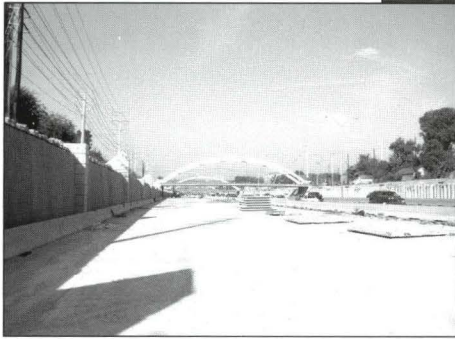
The \$36.5 million reconstruction was completed 30 days ahead of schedule with a cost savings of \$420,000, despite encountering such hurdles as Tropical Storm Allison. The storm dumped more than 38 inches of rain in



NJDOT used the Load and Resistance Factor Design method to construct the new US Route 9 Bridge over Nacote Creek.



The new bridge over Nacote Creek has a 7.62-m (25-ft) vertical clearance and two new approach roadways.



Left and above: The Houston Gateway project replaced four bridges spanning the US 59-Southwest freeway.

one weekend, filling the freeway with an estimated 100 million gallons of floodwater from Houston's bayous. The project team met the challenge and had the freeway cleared, cleaned, and reopened in time for the Monday morning rush hour.

The Arizona Department of Transportation; Sundt Construction, Inc.; and the URS Corporation received the Gold Award for their US 93-Boulders Reconstruction Project. The team's task was to widen 12.06-km (7.5-mi) of this narrow, winding roadway, which travels through Mohave Desert terrain, from a two-lane road to a four-lane divided highway. One of the project's hallmarks was environmental stewardship: nearly 20,000 cacti and other flora were salvaged, preserved in nurseries, and replanted after the construction work was done. Almost 3,000 boulders in the area were also salvaged and replaced by the project team. Extensive accommodations were also made for wildlife: the Desert Tortoise, for example, had its own protection and mobility plan during construction.

The National Partnership for Highway Quality (NPHQ) brings together State, Federal, and highway industry leaders to encourage the use of quality practices that will improve safety and service for highway users. Members include the Federal Highway Administration, American Association of State Highway and Transportation Officials, American Public Works Association, Foundation for Pavement Preservation, National Institute for Certification in Engineering Technologies, and a number of roadway construction trade associations.



This photo shows the reconstruction of the 28th Street at Broadmoor Avenue intersection in Grand Rapids and Kentwood, Michigan.

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FHWA Bridge Management Information Lab: Making the Most of the Nation's Bridge Data

The sudden catastrophic collapse of the Silver Bridge connecting Point Pleasant, West Virginia, and Kanauga, Ohio, in 1967 focused the Nation's attention on the deterioration of the national bridge network. To improve safety and stem the tide of deterioration, the Federal Highway Administration (FHWA) established the National Bridge Inspection Program in 1970. The program requires State highway agencies to inspect their bridges every 2 years and submit the inspection results to FHWA, where they are maintained in the National Bridge Inventory (NBI) database.

The NBI data provides the most comprehensive multi-year source of network level composition and condition information for U.S. highway bridges. However, despite the great potential for research and analysis offered by the NBI database, it has not always been easy for bridge engineers and other interested parties to readily access the data.

To facilitate access to the NBI and other bridge data, as well as establish a place for objective research, FHWA created the Bridge Management Information Systems Laboratory (BMISL) in 1994. The lab's objectives include:

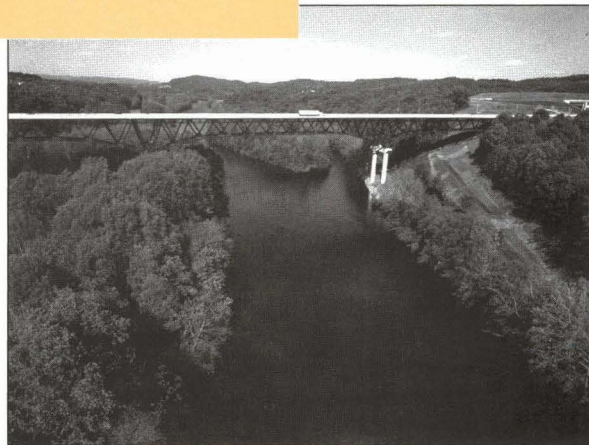
- Examining all sources of bridge system information
- Identifying causes of deficiencies in the bridge network
- Conducting data mining and data analysis to identify bridge materials and their deterioration patterns
- Conducting research to enhance bridge management decision making

- Developing tools for disseminating useful bridge-related information.

Recent lab activities have included developing statistical models for predicting and analyzing bridge deteriorations and testing the application of artificial intelligence to improve the bridge management decision-making process. Data collection and integration activities are ongoing, as is the development of a repository for geotechnical, environmental, climatic, and other bridge data. "By integrating disparate data sources and applying the tools developed, new insights, understanding, and knowledge about the Nation's bridges are being created," says Steve Chase, Technical Director for Bridges in FHWA's Office of Infrastructure Research and Development.

Upcoming *Focus* articles will highlight these data mining and analysis and bridge management research activities, as well as products that have been developed to help State highway agencies and others tap into the lab's storehouse of data, so stay tuned. For more information about the BMISL, contact John Hooks at FHWA, 202-493-3023 (fax: 202-493-3086; email: john.hooks@fhwa.dot.gov) or visit www.tfhr.gov/about/bmis.htm. *

"By integrating disparate data sources and applying the tools developed, new insights, understanding, and knowledge about the Nation's bridges are being created."



The National Bridge Inventory provides the most comprehensive multi-year source of information about the composition and condition of U.S. highway bridges.

Highway Technology Calendar

The following events provide opportunities to learn more about products and technologies for accelerating infrastructure innovations.

World Steel Bridge Symposium and Workshops

November 19–21, 2003, Orlando, FL

The symposium will cover such focus areas as short and intermediate span bridges, accelerated bridge construction, innovative bridge designs, and inspection and maintenance. The event is sponsored by the National Steel Bridge Alliance and the Federal Highway Administration (FHWA).

Contact: Darice Elam at the National Steel Bridge Alliance, 312-670-7011 (fax: 312-670-5403; email: elam@nsbaweb.org).

Asphalt Rubber 2003

December 2–4, 2003, Brasilia, Brazil

The conference will cover such topics as asphalt rubber binder properties, hot-mix properties, design guidelines, recycling, and performance modeling.

Contact: Consulpav International at ar2003@consulpav.com.

International Conference on Seismic Bridge Design and Retrofit for Earthquake Assistance

December 8–9, 2003, La Jolla, CA

The world's leading seismic bridge engineers and researchers will discuss recent advances in seismic bridge research and implementation. Session topics include bridge seismic design and analysis, seismic isolation of bridges, and important bridge projects in seismic zones.

Contact: Phyllis Erebor at the American Concrete Institute, 248-848-3784 (fax: 248-848-3768; email: phyllis.erebor@concrete.org; Web: www.concrete.org/EVENTS/conferences/conference.htm).

Transportation Research Board 83rd Annual Meeting

January 11–15, 2004, Washington, DC

Transportation professionals from around the world will gather at the meeting to share their knowledge and perspectives on current developments in transportation research, policy, and practice.

Contact: For information, visit the TRB Annual Meeting Web site at www4.nationalacademies.org/trb/annual.nsf.

Fourth National Seismic Conference and Workshop on Bridges and Highways

February 9–11, 2004, Memphis, TN

The conference will provide a forum for exchanging information on current national and regional practices for designing seismic-resistant bridges and highway systems and retrofitting existing structures and highways. An International Forum will feature speakers from various countries that have implemented advanced earthquake design and mitigation technologies and approaches.

Contact: Wendy Pickering at the University of Illinois, 217-333-2880 (fax: 217-333-9561; email: fourthphseismicconf@ad.uiuc.edu; Web: www.conferences.uiuc.edu/seismic).

Asphalt Pavement Conference 2004: 21st Century Construction

March 15–16, 2004, Nashville, TN

The conference will focus on construction practices that are necessary to building hot-mix asphalt pavements that will last. Session topics will include paving and compaction, contracting

practices, and plant operations. The conference is being held in conjunction with the World of Asphalt 2004 Show & Conference. Sponsors include the Asphalt Institute, National Asphalt Pavement Association, State Asphalt Pavement Associations, Tennessee Department of Transportation, American Association of State Highway and Transportation Officials, and FHWA.

Contact: For registration information, call 800-355-6635 (fax: 800-979-3365; email: info@worldofasphalt.com) or visit www.worldofasphalt.com.

2004 Concrete Bridge Conference

May 17–18, 2004, Charlotte, NC

The conference will focus on high-performance concrete bridges and rapid bridge construction. The event is sponsored by the National Concrete Bridge Council, Portland Cement Association, and FHWA.

Contact: Shri Bhide at the Portland Cement Association, 847-972-9100 (fax: 847-972-9101; email: sbhide@cement.org; Web: www.nationalconcretebridge.org/cbc/index.html).

First International Symposium on the Design and Construction of Long Lasting Asphalt Pavements

June 7–9, 2004, Auburn, AL

The symposium will facilitate the exchange of information on materials and mix design, construction issues, quality control/quality assurance, contracting methods, perpetual pavements, and other related topics. Sponsors include the International Society for Asphalt Pavements, the Asphalt Alliance, and FHWA.

Contact: Registration information is available at www.asphalt.org. *

FOCUS

Focus (ISSN 1060-6637), which is published monthly by the U.S. Department of Transportation's Federal Highway Administration (FHWA), covers the implementation of innovative technologies in all areas of infrastructure.

Its primary mission is twofold: (1) to serve the providers of highway infrastructure with innovations and support to improve the quality, safety, and service of our roads and bridges; and (2) to help promote and market programs and projects of the various offices of FHWA's Office of Infrastructure.

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Publication No. FHWA-RD-04-019
HIF-1/10-03(10M)E

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NPHQ Awards,

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Also a Gold Winner were the Maryland State Highway Administration, IA Construction, and the Wilson T. Ballard Company for the Canal Parkway Project in Cumberland. The \$48 million, two-lane parkway extends for 2.9-km (1.8-mi) and has opened access to the region, sparked public and private investment in Cumberland, and solved a 60-year bottleneck of traffic. Partnerships were key to the project's success, with stakeholders including the National Park Service, CSX Transportation, the U.S. Army Corps of Engineers, City of Cumberland, and the Canal Place Preservation and Development Authority. The project finished on time and under budget, while incorporating such context-sensitive design elements as the construction of a bicycle and pedestrian trail.

Five State winners were also honored at the awards ceremony (see sidebar). For more information on NPHQ or the 2003 awards, contact Bob Templeton at 512-301-9899 (fax: 512-301-9897; email: btemplephq@aol.com) or visit www.nphq.org. *

NPHQ State Award Winners

- Georgia Department of Transportation; Shepherd Construction Co., Inc.; and E.R. Snell Contractor, Inc., for the I-285 Resurfacing Project.
- Kentucky Transportation Cabinet; Hinkle Contracting; Central Rock Mineral, Co.; and H.W. Lochner, Inc., for the Reconstruction of Paris Pike.
- North Carolina Department of Transportation and the S.T. Wooten Corporation for the White Oak River Bridge Replacement.
- Ohio Department of Transportation, the Kokosing Construction Company, and Parsons Brinckerhoff Ohio, Inc., for the Interstate 70 Reconstruction.
- Oregon Department of Transportation and J.C. Compton, Inc., for the Oregon 99W Brutscher Street to Main Street Project in Newberg.

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