



# Centered on Service

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## Engineering Assessment Team Rolls Out New Bridge and Tunnel Security Workshops

In 2005, the Federal Highway Administration (FHWA) delivered a workshop on Bridge and Tunnel Security a dozen times to various States throughout the country. The workshop was broad, covering several topics, but only reached engineers and technicians. It was noted that there was a need for two separate courses, one for engineers and managers and another for technicians and first responders. The FHWA Resource Center's Structures Technical Service Team took the lead in developing these new workshops in 2006 with help from the FHWA Office of Bridge Technology and the U.S. Army Corps of Engineers.

The **Risk Management for Terrorist Threats to Bridge and Tunnels Workshop** is 1½ days long and is designed to give engineers and managers the understanding to develop a cost-

effective risk management plan for a structure using a component level analysis. More specifically, they will learn to identify strengths and weaknesses of bridge and tunnel components, the damage to be expected for terrorist threats, and how to analyze the risk of each component to a specific threat. Threats



*Centered on Service is a quarterly publication dedicated to sharing success stories and updates on FHWA Resource Center projects and ongoing news about services provided by the Technical Service Teams to the FHWA Division Offices, Headquarters Offices, and State Partners.*

covered include vehicle-borne improvised explosive devices, hand-emplaced improvised explosive devices, non-explosive cutting devices, fire, and vehicle impact.

“Best course I have been to . . .”

“This class has added value to my job.”

*Quotes from course evaluations*

The **First Responder Awareness to Terrorist Threats for Bridges and Tunnels Workshop** is 1/2 day long and is designed to give first responders, such as law enforcement personnel, inspectors, and other emergency responders, an overall awareness of terrorist threats and structural vulnerabilities. More specifically, they will learn to identify strengths and weaknesses of bridge and tunnel components as well as the damage to be expected for terrorist threats. Threats covered include vehicle-borne improvised explosive devices, hand-emplaced improvised explosive devices, non-explosive cutting devices, fire, and vehicle impact.

From February 28 through March 3, the two new workshops were rolled out to Washington State in Olympia and Seattle, training 63 people with 3 workshops in 4 days. Participants in the workshops were from the Washington State Department of Transportation (DOT), City of Seattle DOT, and FHWA’s Washington Division Office. The workshops were well received, and the Engineering Assessment Team is planning the delivery of 12 more workshops in 6 States.

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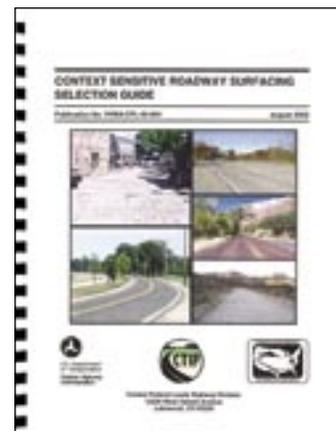
## TECHNICAL ASSISTANCE

### FHWA Resource Center Helps Federal Lands Highway Division Develop *Context Sensitive Roadway Surfacing Selection Guide*

In 2005, the Federal Highway Administration (FHWA) published the *Context Sensitive Roadway Surfacing Selection Guide*. The guide documents the available options for roadway surfacings and provides a decision-making process to allow consideration of functionality, performance, durability, safety, life-cycle costs, and aesthetics and environmental impacts.

This guide was produced by FHWA’s Federal Lands Highway (FLH) Division. The guide presents a review of FLH’s Project Delivery Process (PDP) and a proposed roadway surfacing selection process that includes consideration of context sensitivity, to be used in conjunction with the PDP. A CD-ROM titled “Roadway Surfacing Options Photo Album” accompanies this guide.

The FHWA Resource Center provided technical assistance in the development of the guide.



### Colorado Scenic Byway Project Demonstrates Need for Road Surfacing Guidance

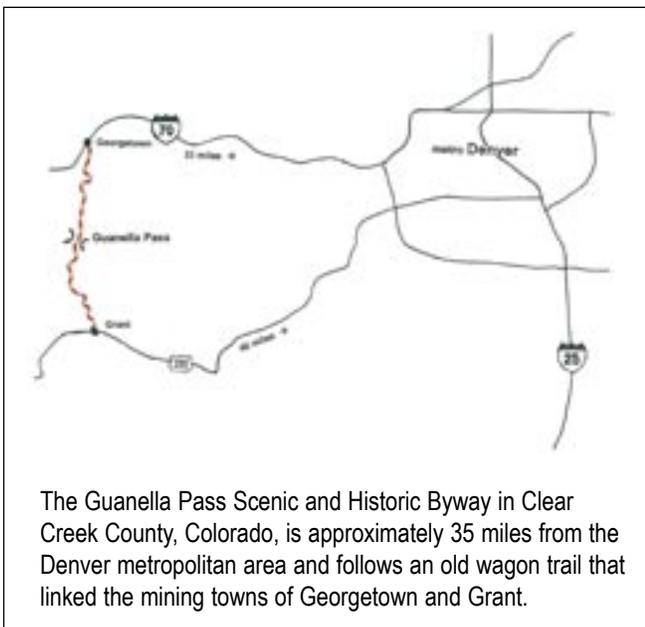
The FLH Division is the primary road builder for the National Park Service, U.S. Forest Service (USFS), U.S. Fish and Wildlife Service, and several other government agencies. The roads constructed or rehabilitated by FLH are generally low to medium volume roads. The FLH’s customers, as well as communities, environmental organizations, and individual landowners, are increasingly concerned about the selection of roadway surfacing types—in particular, the riding surface on proposed projects. Often the project stakeholders have difficulty agreeing on a preferred surfacing type because of biases of performance, aesthetics, or other issues.

Such a project example regarding surfacing type and other environmental questions prompted the development of the *Context Sensitive Roadway Surfacing Selection Guide*. The Central Federal Lands Highway Division (CFLHD) designed the Guanella Pass Road in the Colorado Rocky Mountains for a USFS project. The Guanella Pass abuts a historic Victorian mining district and traverses subalpine forest and alpine tundra. The project also parallels alpine creeks with lakes that compose watersheds, which supply surface water for use by many households.

The Guanella Pass Road project involved substantial environmental controversy provoking the following concerns:

- Upgrade of roadway surface from unbound gravel to various hard surfaces that likely would affect water quality.
- Visual aesthetics of the mountainscape.
- Speeds of vehicles that might affect the recreational use of the road.

The selection process for roadway surfacing pointed to a need for guidance on selecting surfacing materials based on the context of the roadway that was being designed. The CFLHD agreed to test the use of four or five surface types (as test sections) in the initial construction phase of this project for two purposes: to satisfy interested groups, and to protect the various environmentally sensitive areas of the project.



### America's Byways: Guanella Pass Road

Guanella Pass Road leapfrogs the steep divide between the South Platte and Clear Creek watersheds, passing through a succession of distinct environments. Thick stands of spruce, fir, aspen, and pine rise along cascading creeks in the lower elevations. Higher up, the streams snake through broad meadows. The road crests well above the timberline, where every spring the fragile tundra thaws and blossoms. This region, once providing work for miners and trappers, now attracts history enthusiasts and nature and recreation seekers.

### Resource Center Assists With Proposal Development and Evaluation

The complexities exhibited in the Guanella Pass Road project revealed a critical requirement to provide direction in the selection process for roadway surfacing. In 2002, the FLH Division initiated steps to advance development of a guide through a research contract:

- *Research Panel Organized to Lead Project.* The panel was responsible for overall project direction and verification of technical merit of materials and for acceptance of the procedures for FLH Division use.
- *Technical Personnel Selected to Staff the Panel.* The Research Panel included an Environmental Specialist, a Pavement Specialist, a Materials Specialist, and a Technology Transfer Specialist.
- *FHWA Resource Center Invited to Provide Technical Assistance.* Pavement and Construction specialist Bernie Kuta of the Construction and Project Management Technical Service Team contributed technical assistance with proposal development and the evaluation of the contractor proposals. Kuta also

participated on the panel for the duration of the research contract to advise and share knowledge in pavement and materials, along with offering recommendations in construction processes.

In 2003, a research contract was awarded to Golder Associates, Inc. The contract designated the following tasks:

- Develop a summary list of surfacing options with a matrix of distinguishing characteristics.
- Develop a decision process tree to objectively evaluate the appropriateness of surface types.
- Develop presentation materials for use by designers and environmental specialists for client and public meetings.
- Develop training aids for implementation.

### **Research Contract Calls for *Context Sensitive Roadway Surfacing Selection Guide***

1. *Literature Review and Investigation.* Golder Associates delved into common surfacing products such as conventional hot mix asphalt and unbound gravel as well as specialized products such as colored stamped concrete, natural stone pavers, and synthetic polymer emulsions. Over 100 individual roadway surfacing types and subsequent combinations were identified in this phase of the work. The panel tasked the contractor to develop a matrix of characteristics of the most common 75 percent of these surfacing types.
2. *Standard List (Description) of Characteristics.* A standardized format was developed for describing surface characteristics within 11 general topics, each with subtopics (listed below) that vary according to critical aspects of each product. The needs and warrants for each product are intended to be an objective description of the product.
  - General Information: Product description, generic and trade names of products, suppliers.
  - Application: Typical use, traffic, restrictions on use.
  - Design: Typical structural layer coefficient, base requirements, special considerations.
  - Construction: Product availability, constituent materials and equipment needed for placement, lane closure requirements, weather-related restrictions, and typical construction rates.

- Serviceability: General performance history, life expectancy and preservation potentials, anticipated ride quality and potential distresses, potential maintenance needs.
- Safety: Skid resistance potential, potential hazards associated with the surface type.
- Environmental Concerns: Raw material sources, short-term impact due to construction process, potential long-term environmental impacts, recyclability, roadway noise, and manufacturing energy usage.
- Aesthetics: Color and texture of finished and worn-in product, description of probable maintenance effects on appearance over time.
- Cost: Approximate unit costs (2004).
- Example projects: (not just by the FLH Division).
- Resources: Further information such as product suppliers or industry associations.

3. *Prioritization Methodology.* The contractor developed a prioritization methodology that incorporated rating these factors in a multiple-step decision matrix that results in objectively ranked suitability of surfacing types for use based on the various project needs. This is not a pavement design methodology, but rather a tool to help select a surface type based primarily on the appearance of the surface material.
4. *Roadway Surfacing Selection.* The FLH Division published the *Context Sensitive Roadway Surfacing Selection Guide* (Publication No. FHWA-CFL/TD-05-004) in August 2005. The process has been used in 2005 and 2006 to make decisions on several minor projects. Since the procedure can be used in whole or in part on a project, depending on the nature of and the amount of controversy related to the project, the FLH Division is encouraging designers to use the procedure on any type of project.
5. *Companion Roadway Photo Album.* The FLH Division published a companion “Roadway Surfacing Options Photo Album” that provides inservice pictures and details of over 45 surface types. It is available on compact disc (Publication No. FHWA-CFL/TD-05-004a).
6. *Training.* The FLH Division is developing training on the use of the *Context Sensitive Roadway Surfacing Selection Guide* for environmental managers and project managers within the FLH Program. It is anticipated that the Guide will be useful to other organizations that have to make choices of roadway surfacing materials in the context of environmental controversy.

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Example project  
 worksheet.

APPENDIX C—EXAMPLE PROJECTS

Surfacing Selection Analysis Worksheet

Surfacing Type	Synthetic Binder Concrete Pavement		SCORING FACTOR	WEIGHTING FACTOR	SCORE
	WEIGHTING FACTOR				
<b>PERFORMANCE AND DURABILITY ATTRIBUTES</b> <u>39%</u>					
9 %	Durability	2	x	0.09	= 0.27
9 %	Life Expectancy	4	x	0.09	= 0.36
5 %	Maintenance Requirements	3	x	0.06	= 0.15
12 %	Safety/Surface Characteristics	5	x	0.12	= 0.60
<b>CONSTRUCTABILITY AND COST ATTRIBUTES</b> <u>20%</u>					
10 %	Life-Cycle Cost	1	x	0.10	= 0.10
2 %	Availability	1	x	0.02	= 0.02
4 %	Construction Impacts	4	x	0.04	= 0.16
3 %	Weather Limitations	2	x	0.03	= 0.09
<b>CONTEXT SENSITIVITY ATTRIBUTES</b> <u>41%</u>					
9 %	Environmental Impacts	5	x	0.09	= 0.45
18 %	Visual Quality	5	x	0.18	= 0.90
18 %	Context Compatibility	5	x	0.18	= 0.90
100 %				<b>TOTAL RATING</b>	<b>4.01</b>

WEIGHTING FACTOR: PERCENT OF IMPACT ON SURFACING SELECTION (TOTAL = 100%)  
 SCORING FACTOR: 1 = POOR OR NOT DESIRABLE; 5 = EXCELLENT OR HIGHLY DESIRABLE  
 FOR MOST SITUATIONS, NO CATEGORY SHOULD HAVE A WEIGHTING FACTOR LESS THAN 20% OR GREATER THAN 50% AND NO INDIVIDUAL ATTRIBUTE SHOULD HAVE A WEIGHTING FACTOR GREATER THAN 20%.

Figure 5. Worksheet. Example I Synthetic Binder Concrete Pavement Worksheet.

**New Workshop Explains Percent Within Limits:**

**FHWA Recommends PWL for Measuring the Quality of Pavement Materials**

There are many ways State departments of transportation can measure the quality of pavement material. Most State highway agencies accept pavement material from a contractor and pay that contractor through a system of incentives and disincentives. The Federal Highway Administration (FHWA) is recommending one particular method as its *quality measure of choice*. It is called “Percent Within Limits,” or PWL.

PWL ties payment of pavement materials to a more statistically accurate measure of quality that is based on controlling both the center and spread of the test results to determine how much of the material represented by those tests is within the specification limits. Many State highway agencies use methods to identify quality that only control either the mean or the variability of the test results.

PWL uses basic statistical methodologies to determine the quality of pavement. After obtaining multiple random samples, PWL is computed, starting with the mean and standard deviation of the samples and tests, with the mean and standard deviation used to compute the quality index, and finally the quality index is converted to an “estimated” PWL using tables and computer software. PWL essentially estimates the total percentage of the material that meets the specification limits. A PWL of 98.3, for example, means that an estimated 98.3 percent of the material meets the project specification.

“Obtaining a ‘true’ PWL would require testing all of the contractor’s material,” says Dennis Dvorak, a materials engineer with FHWA’s Resource Center in Olympia Fields, IL. “Because it’s not practical and realistic to test all of the material, we need to estimate what is produced using a statistically valid measure of quality based on multiple random samples. PWL provides that valid measurement,” he said.

“One sample doesn’t tell us much,” says Dvorak. “Two samples show us there’s variability in the material. Three samples start to give us a sense of the magnitude of the variability, and additional samples improve the estimate of the variability. But multiple samples help us better define the actual quality that’s present in the pavement materials.”

“Once the PWL is determined, the contractor is paid based on meeting the requirements,” says Ewa Flom, a pavement engineer from FHWA’s Office of Pavement Technology. “A properly established PWL specification will motivate the contractor to improve quality and innovate,” she says. “When specification limits are set by good performance and achievable production, then PWL is a positive approach for achieving these goals. FHWA believes it’s a good way to go.”

**Workshops Provide Basic PWL Overview**

FHWA is offering an introductory workshop to provide an overview of how PWL works and how to apply the methodology. The 1-day workshop, which debuted February 8, 2006, in Raleigh, NC, includes a series of hands-on exercises that give participants the opportunity to experience how PWL actually works. One module provides a review of basic statistical concepts, such as random sampling, averaging, and standard deviation. Other modules provide an overview and a comparison of various quality measures and how to compute PWL. Two additional modules focus on setting specification limits and payment plan issues. The workshop targets State highway agency and FHWA division staff responsible for developing and overseeing quality assurance specifications.

**Percent Within Limits Workshop**

The Federal Highway Administration (FHWA) is offering an introductory workshop to provide an overview of how Percent Within Limits (PWL) methodology works and how to apply it. The 1-day workshop includes a series of hands-on exercises that give participants the opportunity to experience how PWL actually works. In addition to the workshop, several resources are available to assist with implementing PWL. These resources include two FHWA publications:

- *Optimal Procedures for Quality Assurance Specifications* (Publication No. FHWA-RD-02-095)
- *Evaluation of Procedures for Quality Assurance Specifications* (Publication No. FHWA-HRT-04-046)

These publications are available online at [www.fhwa.dot.gov/pavement](http://www.fhwa.dot.gov/pavement). Click on “Publications.”

PWL has been around for many years, according to Dvorak, initially getting its start in the U.S. military after World War II. FHWA started encouraging the method about 30 years ago. PWL has slowly expanded into government and the private sector to the point where today more than half of State highway agencies use PWL in various ways, according to a recent study.

So why is FHWA emphasizing PWL now? “Computers have made using PWL much easier,” says Jim Walls, a pavement design engineer from FHWA’s Resource Center office in Baltimore, MD. “A variety of software packages are making PWL much easier to use by making all the calculations for you.”

FHWA also wants contractors and State highway agencies to do the job right—to have the proper quality controls in place throughout the process so that pavement performance can be improved. “This emphasis on quality will go a long way in better serving our customers, the motorists out there who drive our highways everyday,” says Walls.

**For more information** on PWL or scheduling a workshop in your State, contact one of the FHWA PWL team members. You can also visit the PWL Web site at [www.fhwa.dot.gov/pavement/pwl/](http://www.fhwa.dot.gov/pavement/pwl/). The PWL team members are also available to provide technical assistance in conjunction with the workshop.

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**Resource Center Demonstrates Latest Advancements at TRB 2006**

The FHWA Resource Center (RC) was asked to provide staff presentations, lead technical discussion groups, and participate as an exhibitor in the 85th Annual Transportation Research Board Meeting in Washington, DC, January 22–26, 2006, at the Marriott Wardman Park, Omni Shoreham, and Hilton Washington Hotels.

In the exhibit hall, the FHWA RC distributed a variety of materials on technical innovations of interest in 11 technical specialty areas—air quality, civil rights, construction and project management, environment, finance, geotechnical and hydraulic engineering, operations, planning, safety and highway design, and structures. The RC booth was also a source for the latest market ready technology (MRT) guidance issued by the Administrator.



*Scott Hogan (L) demonstrates proper culvert design as Eric Brown, Hydraulics Engineer, RC Geotech and Hydraulics TST, discusses advantages with other visitors (background).*

One of the highlights of the FHWA RC exhibit at the annual event was a portable demonstration flume. The flume is used in two National Highway Institute (NHI) training courses, Culvert Design (FHWA-NHI-135056) and Introduction to Highway Hydraulics (FHWA-NHI-135065), to show basic hydraulic principles associated with the design of highway drainage features including culverts and energy dissipators. Scott Hogan, Manager Engineering Services, Ayres Associates, was on hand to assist RC staffer Eric Brown in explaining many of these concepts to exhibit attendees.

Specific flume demonstration and discussion topics included the following:

- The effects of barrel roughness, length, slope, inlet geometry, and tailwater depth on culvert performance.
- The design and effectiveness of culvert energy dissipators including baffle rings and outlet basins.
- The use of basic fish passage measures, including culvert baffles and embedded (depressed) culvert barrels.

Eric Brown, hydraulics engineer, FHWA RC, was also present during several of the demonstrations to answer questions. The flume demonstrations were well received by many of the TRB exhibit attendees, who asked many insightful questions and expressed interest in the FHWA hydraulics program.

The hydraulics engineers of the FHWA RC and Office of Bridge Technology wish to thank the NHI for sponsoring the flume demonstrations.

**For more information** about hydraulics training, design guidance, policy, and conferences, contact the FHWA RC hydraulics engineers at

[www.fhwa.dot.gov/resourcecenter](http://www.fhwa.dot.gov/resourcecenter)

or refer to the FHWA Hydraulics Web site at the following link:

[www.fhwa.dot.gov/engineering/hydraulics/index.cfm](http://www.fhwa.dot.gov/engineering/hydraulics/index.cfm)

The TRB Annual Meeting program covered all transportation modes, with more than 2,600 presentations in 500 sessions addressing topics of interest to all attendees—policymakers, administrators, practitioners, researchers, and representatives of government, industry, and academic institutions. This year's spotlight theme was "Transportation 2025: Getting There from Here." Also highlighted were "The Interstate Highway Systems 50th Anniversary—What Have We Learned?" and "SAFETEA-LU: What It Means for Research and the Transportation Community."

The FHWA RC distributed complete packages of the 2006 MRT one-pagers to all FHWA division offices, headquarters program offices, and Federal Lands Highway staffs immediately following TRB. Twenty-four MRTs are designated in the package.

For additional copies of individual technology one-pagers, interested parties are directed to contact the specialist listed at the bottom of the one-pager.

For additional sets of all 24 technology one-pagers, contact the Resource Center Communications and Marketing Team Leader at [carin.michel@fhwa.dot.gov](mailto:carin.michel@fhwa.dot.gov).

## PARTNERSHIPS

### Transportation Agencies, Universities, and Industry Groups Initiate National Pavement Preservation Partnerships

Traditionally, highway agencies have allowed the ride characteristics and structural condition of their pavements to deteriorate to fair or poor condition before taking action to rehabilitate or reconstruct their pavements. The primary objective of rehabilitation work is to repair structural damage and restore pavement conditions such as ride, rutting, and cracking. This is a very costly and time-consuming activity that contributes significantly to traffic congestion and imposes economic and social impacts on adjacent businesses and residences.

The concept of pavement preservation has long been recognized as a proactive approach in maintaining existing highway systems. Using timely preservation practices has proven to provide the traveling public with improved safety and mobility, reduced congestion, and smoother, longer lasting pavements. More and more highway agencies are beginning to recognize the economic and social benefits of a pavement preservation program.

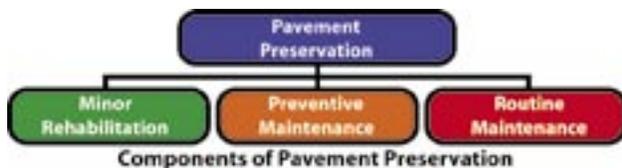
The important thing to remember is that pavement preservation is not about maintenance as usual!

A pavement preservation program consists primarily of three components: preventive maintenance, minor (non-structural) rehabilitation, and routine maintenance activities. Each of these components provides a number of treatments or practices geared towards preserving the existing pavement.

The Federal Highway Administration, American Association of State and Highway Transportation Officials, and most industry partners define pavement preservation as follows:

*"A program employing a network level, long-term strategy that enhances pavement performance by using an integrated, cost-effective set of practices that extend pavement life, improve safety, and meet motorist expectations."*

An effective pavement preservation program will benefit highway agencies by preserving and stretching the investment in their roadways, optimizing pavement performance, extending pavement life, reducing user delays (congestion), and providing improved motorist safety.



Today, highway agencies face a common hurdle. Dwindling financial resources, increasing infrastructure demands and a shrinking workforce provide a tremendous challenge. Highway agencies realize they must interact across State and regional boundaries, pool their financial resources, identify common issues, develop solutions, and embark on a systematic approach to implementing preservation principles. The Federal Highway Administration's (FHWA's) transportation pooled fund program can provide the mechanism for highway agencies to achieve their goals.

### Regional Groups Address Pavement Preservation Needs

The recognition by highway agencies that pooling resources is the logical way to address pavement preservation needs has led to the formation of several regional groups. In the spring of 2001, the Midwestern Pavement Preservation Partnership (MP3) was formed. This group consists of many Midwestern State transportation agencies, universities, and industry groups. Its purpose is to provide an ongoing regional forum to discuss preservation principles, and to share improvements in design, construction, and maintenance practices, as well as to identify research and specification needs. Since MP3 was established, other regional efforts have begun to gain momentum.

In the fall of 2004, the Northeast Pavement Preservation Partnership was formed with essentially the same purpose as the MP3. To date, similar movements are now underway in the southern and the western parts of the Nation; they are known as the Pavement Preservation Technology Transfer Among Southeast States and the Western Pavement Preservation Partnership, respectively, and have similar goals.

The intent for each regional group is not only for its member highway agencies to partner among their respective member highway agencies but also to enlist the participation and technical capabilities of the contracting industry as well as academia.

### Regional Groups Utilize the FHWA's Pooled Fund Process

The regional groups are planning to utilize FHWA's pooled fund concept to address their needs. The advantages to this are as follows:

**Reduction of Duplicate Effort.** States should have uniform or consistent specifications, performance standards, training, and certification requirements. Both the FHWA and the States are losing experienced staff through retirements and attrition, but by partnering with industry and other agencies

#### Pooled Fund Objectives

1. Promote regional guidelines for pavement preservation treatments that provide consistency, reduce costs, and foster better practices.
2. Promote the use of improved materials, equipment, and processes among the member agencies by determining what works best and by sharing successes.
3. Implement a comprehensive information-sharing process by discussing successes and failures and developing an interactive question-and-answer clearinghouse on the National Center for Pavement Preservation Web site.
4. Establish a coordinated regional research effort by promptly addressing common research needs. Members would determine the regional research priorities by vote and could then use the research results to support policy changes by their respective leaderships.
5. Advocate policies that integrate system preservation activities by providing information supporting the use of pavement preservation, implementing pavement management system strategies to improve network conditions, and changing from a "worst first" policy to prevention.
6. Publicize pavement preservation findings at the national level by documenting successes and research studies, presenting benefits of pavement preservation at national meetings, and preparing articles for publication.
7. Advocate a common terminology, complete with definitions, to ensure consistency in the transfer of information.

they can still find the expertise necessary to successfully accomplish their work.

**Partnering to Exchange Ideas.** Materials and techniques may not be universally applicable, but collaboration in partnership is an effective way to learn what works for others, to identify innovation, and to implement new technologies.

**Partnering to Accelerate Implementation of Preservation Programs.** Utilizing peer exchange among highway agencies to identify common research and development and training needs is a must in order to facilitate program implementation. Shared goals mean shared expenses.

### **Pavement Preservation Partnerships Plan Innovative Approach to Pooled Fund Concept**

Traditionally, States and the FHWA have found the pooled fund concept to be the most cost-effective way of seeking solutions to common issues. The various pavement preservation partnerships plan to use this concept with some changes to the traditional mechanism. The MP3's Lead State (Michigan DOT), through its existing agreement with the NCPP, will administer the overall administrative activities of the regional partnerships, treating them as a single pooled fund effort. However, each regional partnership will also have one designated *regional* Lead State. This State would be responsible for all technical coordination among its regional partnership members. The Lead State would also be responsible for technical and administrative coordination between the group and the MP3 national Lead State.

The MP3 group is already underway; it has posted its pooled fund study solicitation on the Transportation Pooled Fund Program Web site:

[www.pooledfund.org/](http://www.pooledfund.org/)

The southern and western groups have also posted a solicitation on the Web. The northeastern group has a solicitation ready to go and is expected to post it soon.

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## SPECIAL FEATURE

### **New Course Flyers Available From National Highway Institute**

The National Highway Institute (NHI) is now preparing and distributing a "Blueline" for each new and updated course. The NHI Blueline is a one-page flyer describing the course, learning outcomes, target audience, price, and points of contact. These flyers are e-mailed to NHI local coordinators, FHWA training coordinators, assistant division administrators, Resource Center technical service teams, Local and Tribal Technical Assistance Programs, the Transportation Curriculum Coordination Council, and the American Association of State Highway and Transportation Officials. Bluelines are also available upon request for use at events and conferences.

E-mail [kevin.monaghan@fhwa.dot.gov](mailto:kevin.monaghan@fhwa.dot.gov) with any requests for Bluelines.

## CENTERED ON RESULTS

### New Staff Profiles



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Craig recently joins the Construction and Project Management Team on a part-time basis while completing oversight of Colorado's \$1.67 billion T-REX project. As part of the FHWA major project oversight program, Craig has served as project administrator on the T-REX design-build project since 2001. Craig began his career with FHWA in 1979, when he joined the agency's Highway Engineer Training Program. Prior to joining the Colorado Division in 2001, he served 11 years as a team leader in the Central Federal Lands Highway Division. Craig has expertise in the areas of design, contract development, project management, construction, and contract administration. Craig is a graduate of Idaho State University with a bachelor of science degree in civil engineering, and he is a registered professional engineer in Colorado.



#### FINANCE

**William Keith Bishop**  
**Innovative Finance Specialist**  
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William Keith Bishop joins the Innovative Finance Technical Service Team as an innovative finance technical expert. Keith's leadership experiences consist of directing a \$5.3 billion bonding program at the South Carolina Department of Transportation (SCDOT), which has been nationally recognized for its innovation in financing and financial management. He has held numerous executive management positions at SCDOT, including chief finance officer, director of financial planning and cash management, and cash flow analyst. Keith earned a bachelor of science degree in business administration at the University of South Carolina in 1989. He is also a graduate of the Duke University/Harvard University Strategic Leadership Program, the National Transportation Institute at Indiana University, the South Carolina Executive Institute, and the

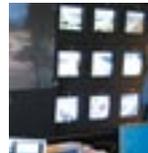
South Carolina Department of Transportation Strategic Training for Transportation Agency Representatives (STTAR) program.



#### PLANNING

**Eric Pihl**  
**Modeling Technical Specialist**  
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Eric Pihl joins the Planning Technical Service Team as a modeling technical specialist, based at the Lakewood office. Eric has more than 9 years of experience in transportation planning and travel demand modeling, which he gained at public agencies and in the consulting world. He has been a community planner/modeling specialist with the Federal Transportation Administration's Office of Planning, where he reviewed ridership forecasts and technical methods for studies seeking New Starts funding. In this capacity, he provided technical support to local agencies, transit operators, and metropolitan planning organizations. Eric has also worked at the Environmental Protection Administration (EPA) as a senior policy analyst in the Office of Transportation and Air Quality, where he reviewed redevelopment projects, including their travel and emissions impacts, for brownfields sites. During his tenure at EPA, he also led a collaborative research project with the University of California to evaluate the ability of four-step travel models to capture the short- and long-range consequences of highway capacity enhancements. Eric has a B.S. in geography, an M.A. in urban planning, and an M.S. in civil engineering.



#### OPERATIONS

**Eddie Curtis**  
**Traffic Management Specialist**  
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Eddie joins the Operations Technical Service Team as a traffic management specialist. He comes to FHWA after serving as a traffic engineering associate for the Los Angeles Department of Transportation (1997-2001, 2002-2006) and as a systems engineer for PB Farradyne. His areas of particular expertise include traffic signal timing; adaptive traffic signal control systems; evaluation and planning of traffic signal system operations; incident detection and management; traffic management center operations; advanced traffic studies; corridor management systems and technology; vehicle detection devices and traffic data collection; and traffic simulation and modeling. He is a member of the Institute of Transportation Engineers and

a recipient of the Dwight D. Eisenhower Transportation Fellowship. Eddie is a registered professional engineer in the States of California and Louisiana. He earned his bachelor of science degree in civil engineering from California State University in Los Angeles in 1997.

## Retirement

### Robert Radics Honored With Superior Career Service Award

Robert Radics received the Superior Career Service Award upon his retirement from the Federal Highway Administration (FHWA) on March 18, 2006, after nearly 39 years of service to the agency and the planning discipline.



Bob's career with FHWA has been characterized by strong dedication, a focus on advancing the agency's mission and goals, and his close work with our State and metropolitan planning organization partners on planning issues.

Bob began his career in 1967 with the Bureau of Public Roads in the training program. He has worked in the Planning Office of Region 9; the Louisiana, Vermont, and Georgia Divisions; and the Region 4 Office. Bob has served as an urban planning engineer; planning and research engineer; planning director; and Planning, Research, Environment, and Right-of-Way Office director.

**"Survival key: maintain a sense of humor; the job is a part of life, not life itself."**

"One of the most striking realizations is the tremendous evolution the agency has undergone since I first joined the Bureau of Public Roads. From our first mission to build the Interstate System we grew to include metropolitan planning, environmental protection, and civil rights as major cornerstones, and grew further to embrace new technologies in the field and the office. We endured major management philosophical swings and many reorganizations, yet emerged intact and with a stronger purpose. Through it all, the concept of "FHWA family" remained strong, and guided our overall treatment of employees."

-Robert D. Radics

Bob was one of the founding members of the Southern Resource Center (SRC) when it was created in 1998, serving as a planning modeling specialist. His responsibilities grew further as he developed this position, and he became the SRC's first intermodal specialist. In this capacity, he worked with the Region 4 OneDOT group, the Military Traffic Management Command's STRAHNET evaluation, and the maritime port of Charleston, South Carolina, on an expansion study. Notably, he also was selected to be the FHWA representative on an OECD Transport Planning Group, where he co-authored a report on "Delivering the Goods: 21st Century Challenges to Urban Goods Transport."

Most recently, Bob served as an intermodal planning specialist on the Resource Center's Planning Technical Service Team. In this capacity, Bob has been instrumental and extremely proactive in the development of new freight-related training and in the initiation of new ideas to serve FHWA division offices more effectively. During his tenure with the Resource Center and throughout his career, Bob has been noted for his depth of planning knowledge, his responsiveness to customer needs, his focus on FHWA objectives, and his ability to clearly communicate planning technical issues to a wide range of audiences.

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