

2013

NHI Training in Action

Improving the Performance
of the Transportation Industry
Through Training



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About NHI

The National Highway Institute (NHI) is the training and education arm of the Federal Highway Administration (FHWA). NHI's team of talented Federal and contract employees are housed within FHWA's Office of Technical Services (OTS). NHI provides leadership and resources to guide the development and delivery of transportation-related training in many formats, including both classroom-based and distance learning. NHI is authorized to award continuing education units (CEUs) through the International Association of Continuing Education and Training (IACET).

For more information, please visit the NHI Web site at www.nhi.fhwa.dot.gov.

NHI Course Categories



Asset Management



Financial Management



Pavements and
Materials



Business, Public
Administration & Quality



Freight and
Transportation Logistics



Real Estate



Communications



Geotechnical



Structures



Construction and
Maintenance



Highway Safety



Transportation
Performance
Management



Design and Traffic
Operations



Hydraulics



Transportation
Planning



Environment



Intelligent Transportation
Systems (ITS)

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Training the Next Generation

NHI is helping fill the knowledge gap left by retiring baby boomers

A skilled and experienced workforce is critical to every transportation agency. As more baby boomers become eligible for retirement, agencies will be challenged with attracting and retaining employees capable of filling these positions. In many cases, retirement of experienced personnel results in core competency gaps that will need to be filled.

“The workforce is changing as baby boomers retire,” says National Highway Institute (NHI) Training Director Rick Barnaby. “Many are in leadership positions or highly technical roles at State and local departments of transportation. As a result, there is a growing need for training that targets mid-career professionals like area engineers and technicians, including those coming into transportation from other industries.”

At the same time, advances in technology and increasingly specialized skill sets also will be required to achieve agency objectives. “Agencies have significant opportunities for process improvements and change as digital natives—those raised with technology—bring new skills to the workforce,” adds NHI Program Manager Heather Shelsta.

As the training arm of the Federal Highway Administration (FHWA), NHI has been providing professional development opportunities to the transportation workforce since 1970. Today, NHI offers hundreds of courses in 17 key program areas, and the organization has charted a clear path forward to continue improving training services, expanding methods of learning, and maintaining affordable prices for transportation professionals.

The organization is making training more accessible and cost-effective for cash-strapped agencies and contractors. “We’re working very hard at understanding needs and tailoring training to each State’s specific operating conditions,” Barnaby says. “Many folks don’t have the time or resources to travel. That’s why our business model is moving toward e-learning.”

In 2011, NHI added 36 new Web-based trainings to its catalog, bringing the total number of Web-based offerings to 121. Distance learning now accounts for nearly half of NHI’s courses. Further, NHI has updated all its Web-based courses to reflect the latest Windows® and Adobe® software. Blended courses, which consist of online and instructor-led components, are on the rise as well. “Instead of 5 days of training, you can do a couple online components at home to get you up to speed, and then spend only 1 or 2 days traveling for the



*NHI Training Director
Rick Barnaby.*

Credit: ICF International

in-person training,” Barnaby says. “E-learning delivers savings for States when travel budgets are restricted.”

The organization also is exploring innovative technologies that could improve training delivery. For example, NHI piloted a virtual bridge inspection course in 2012, which enabled participants to assess bridge defects in a videogame-like virtual environment. In addition, NHI is creating smartphone apps, such as one designed to help technicians perform pavement and bridge inspections in the field.

“Research shows that training participants can lose as much as 80% of what they learn in class in just a couple days,” Barnaby says. “We need to make training so interesting that people who are accustomed to using smartphones, tablets, and videogame systems will be captivated and retain those new skills when they leave the classroom.”

And, since passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) in July 2012, NHI has been doing its part to help FHWA provide national leadership in transitioning to a performance- and outcome-based highway program. “We’re setting a strategy for the future, so we can determine training needs on a national basis,” Barnaby says.

As programs like FHWA’s Every Day Counts and the Transportation Research Board’s Strategic Highway Research Program 2 forge ahead, the future promises an even greater focus on advancing adoption of technologies, innovations, and strategies that do more with less, faster, and with greater attention to quality and longevity. “As new skill sets are needed,” Barnaby adds, “NHI will continue to work very hard to create training that stays on the leading edge of technology and prepares our workforce to thrive and lead the next generation of highway programs.”

*FOR MORE INFORMATION OR TO SCHEDULE A SESSION,
VISIT WWW.NHI.FHWA.DOT.GOV.*

Host Your Next Training at NHI

Spacious new classrooms offer state-of-the-art technology for learning

The National Highway Institute's (NHI) headquarters in Arlington, VA, is an ideal location to host an NHI training session. After more than 10 years at its prior location, NHI relocated to its current office at 1310 North Courthouse Road in 2010, and the space has proven to be both convenient and functional.

Located within a half-mile of the Courthouse Metro subway stop and only a 15-minute drive away from the Nation's capital, NHI offers members of the transportation community the opportunity to host courses in its modern headquarters facility. Four training rooms accommodate groups of up to 65 participants each. The facility also features a dedicated computer lab and video conferencing capabilities to ensure a productive and engaging learning environment. A participant lounge enables attendees to break from training to check emails and touch base with their offices.

Rick Barnaby, NHI's director of training, is excited about new possibilities to expand NHI's training capabilities. "Comfortable surroundings are very important to a quality learning experience," he says. "We wanted to ensure that our facilities would provide hosts with an environment where their participants would get the most benefit from NHI courses."

Since moving to its new location, NHI has welcomed many groups of training participants from across the U.S. Department of Transportation and the Federal Highway Administration, as well as international delegations including representatives from Korea and Tajikistan.

FOR MORE INFORMATION ABOUT HOSTING A COURSE AT NHI'S ARLINGTON LOCATION, PLEASE VISIT WWW.NHI.FHWA.DOT.GOV.



Spacious classrooms at NHI's headquarters facility are equipped with desktop computers and videoconferencing capabilities.

Credit: ICF International



The participant lounge features comfortable seating as well as computer stations where participants can check email during breaks.

Credit: ICF International

Virtual Bridge Inspection

Innovative simulation training offers safety, convenience



The work of bridge inspection—an activity vital to maintaining the safety of the Nation’s surface transportation infrastructure—can be uncomfortable, awkward, and even hazardous. Everything from being in a precarious position on the edge of a bridge to dealing with inclement weather can make performing inspections a challenge, even for the most experienced workers.

When bridge inspection is part of a training activity, logistics issues further complicate the mix. Travel time can cut into the limited hours allocated for field trips, and finding a bridge with an instructive combination of deficiencies to highlight can be difficult. Further, the hosting agency, typically a State department of transportation, must arrange for the transportation, inspection and safety equipment, and insurance required for field inspections. Despite these inconveniences, however, field trips are an essential element of bridge inspection training, helping to ensure that the information covered in the classroom transfers to the job.

In the face of these ongoing challenges, staff at the National Highway Institute (NHI) proposed the idea of incorporating computer simulation into bridge inspection training. The result: virtual bridge inspection, a 3-D computer-based training (CBT)



Course participants are inspecting a bridge as part of a field trip.
Credit: Douglas Blades, FHWA

alternative to traditional field inspection activities. Developed for NHI course 130055 Safety Inspection of In-Service Bridges, the Virtual Bridge Inspection CBT exposes students to 30 bridge conditions and defects that reflect a wide variety of problems encountered in the field during real-world inspections.

The team NHI selected to work on the project considered various forms of modeling and ultimately selected Unity 3D, a versatile, affordable multiplatform tool used for videogame development. This solution offered the potential to create a computer-based training environment that uses high-quality graphics and is easy to navigate. Two other features the team deemed critical were that the program not be connected to the Internet or a network, since training is often conducted at remote sites with no Internet access, and that it be intuitive to use, so valuable class time would not be lost in bringing participants up to speed on how to use the program.

Next, NHI mobilized a development team consisting of training and program personnel from NHI and the Federal Highway Administration (FHWA), as well as industry subject matter experts, graphic developers, and programmers. The team created two virtual bridges, one four-span steel bridge that crosses over a divided highway and one single-span concrete bridge that spans a waterway. Each bridge has 15 checkpoints that represent defects, thereby exposing the participants to a total of 30 typical problems. The program uses an avatar—or virtual representation of the user—and is designed to offer a 3-D, first-person perspective.

“The software was created to help participants feel like they are physically present in the inspection setting,” explains Meredith Perkins, senior instructional system designer at Sevatec, Inc., a contractor for NHI. “The environment is very realistic, with clouds and shadows, an airplane flying overhead, and a stream that moves and babbles.”

Before participants are allowed onto the virtual bridge, they must select safety gear and put it on their avatars, as well as set up the proper traffic safety features. Each participant is provided with 14 tools commonly used by bridge inspectors, including a hammer, grinder, tape measure, flashlight, under bridge inspection truck, chain drag, and spray paint. The tools were designed to be as realistic as possible: the developers used the principles of physics in programming the tools, and added background sounds to give the illusion of being outdoors.



An instructor and participants are using the Virtual Bridge Inspection CBT in the classroom. The video projection on the screen shows an inspector's avatar.

Credit: Meredith Perkins, Sevatec, Inc.

Participants work in teams of two and complete the same bridge inspection forms they would in the field. They can review previous reports and the Bridge Inspector's Reference Manual, and view real-life photos of the defects. Once participants have finished their inspections, they are presented with a checklist to make sure they have addressed every problem.

"When we use actual bridges, we're lucky if we can find one with five or six defects," says Douglas Blades, a bridge engineer in FHWA's Office of Bridge Technology. "You'd never find 15 defects on a real bridge; this way, we can train inspectors in the entire range of possible defects at one time."

To support the training, NHI created a mobile computing lab complete with 15 laptops loaded with gaming-quality graphics cards and high-resolution, 1,600- by 900-pixel screens. NHI piloted the training in March 2012 in Fairfax, VA. Participants spent 2 days working with the virtual bridge inspection program and completing reports and instructor-led briefings related to their findings.

According to Perkins, the feedback was very positive. Many participants felt that the virtual course was better than a physical field trip because

they could inspect far more defects. Others agreed but underscored the importance of participating in physical field trips to gain an appreciation of how expansive even a small bridge can be. Thanks to this new technology, agencies now have additional flexibility when scheduling a session of NHI course 130055, which could be handy during inclement weather or when liability concerns come into play.

FOR MORE INFORMATION, CONTACT LOUISA WARD AT (703) 235-0523 OR LOUISA.WARD@DOT.GOV.

Leaping Toward Innovation

NHI training helps teams market and deploy new technologies



New innovations and technologies are critical to preserving the Nation's roadways, ensuring the safety of travelers, and improving the efficiency of delivering transportation projects. In 2004, the Federal Highway Administration (FHWA) launched Highways for LIFE, a program to advance long-lasting highways using innovative technologies and practices. The initiative helped usher in new approaches to building infrastructure that increase safety and quality while decreasing travel disruptions due to roadway work zones and construction.

At its core, Highways for LIFE is about identifying and accelerating the deployment of innovations. The program applies marketing techniques to inform States about innovative strategies, technologies, and approaches and to encourage departments of transportation (DOTs) to adopt them. Initially, Highways for LIFE staff worked with three FHWA offices to set up teams that created marketing plans, objectives, budgets, and communications tools.

"We were successful in getting those first innovations deployed," says Kathleen Bergeron, a marketing and communication coordinator for FHWA's Center for Accelerating Innovation. "But it was obvious that we needed to do this on a larger scale if we expected to make a real dent in the problem at hand." To that end, Highways for LIFE teamed with the National Highway Institute (NHI) to create course 134073 Leap Not Creep: Accelerating Innovation Implementation.

The course's blended format includes an introductory 2-hour Web conference followed by a 2-day classroom session held a week or two later. Course developer Nancy Laffey, with ADNET Systems, Inc., a contractor for NHI, says the blended format helps keep the course length short and travel costs down. "For many participants, the Web conference is a great means of mastering the basics of innovation implementation and becoming familiar with its importance before being immersed in the process during classroom training," she says. The classroom portion includes exercises that provide



An inspector measures the angle of the tapered pavement edge of a newly paved road. SafetyEdgeSM is one of the most successful innovations implemented by the Every Day Counts initiative, and the EDC marketing team was one of the first to complete NHI's Leap Not Creep training.

hands-on experience in developing deployment plans, determining resources needed, and identifying strategies for overcoming barriers to implementation.

The target audiences for the course are those individuals who lead teams responsible for selecting, deploying, or promoting the use of innovations within an organization. Bergeron notes that this includes both FHWA staff who may be trying to "push" a technology out to States, as well as State DOT employees who would like to "pull" innovations they've heard about into use within their agencies. The course also can be tailored to meet the needs of a specific team or organization, as with FHWA's Every Day Counts (EDC) teams.

In 2009, FHWA launched the EDC initiative to identify promising technologies and processes and accelerate their deployment, with the goal of improving safety and reducing the cost and time needed to complete transportation projects. Teams of experts are responsible for implementing the selected innovations, including presenting a series of summits to teach State DOT staff and other stakeholders about the new technologies and processes. This requires technical experts to become marketers, so FHWA schedules the teams for special sessions of NHI's Leap Not Creep training.

"The course is valuable in providing the participants a shared baseline understanding of developing a technology implementation plan and the foundation

to begin working as a team,” says Marty Ross, a training program manager with NHI. “The teams begin their work with a common vision of what they hope to achieve, armed with new tools, processes, and methodologies that will help facilitate implementation.”

In 2012, FHWA finalized a new set of EDC innovations to share with the States and established a short timeline for teams to complete the training in time for summits scheduled for the fall. To meet the time constraints, Laffey and Bergeron reviewed the existing curriculum and made some tweaks. “We removed those areas that dealt with organizations and people that would ‘pull’ innovations into their operations,” says Bergeron. “These would be used in a webinar for the State representatives at a future time.” This modification to the curriculum reduced the training to a single day for the EDC teams, and the Web portion was further tailored with information specifically for State DOT team leaders.

NHI’s Leap Not Creep course has been valuable for the EDC teams, as evidenced by the fact that the innovations marketed in the first phase of EDC

by teams that received the training were not re-selected for the second EDC phase. That is to say FHWA leadership feels those innovations have been deployed to such a degree that they no longer require the targeted promotion available through EDC. It appears the training, therefore, effectively prepared the teams to market those innovations successfully. Those technologies and processes from the first phase that have been carried over into EDC’s second phase had marketing teams who were not trained through NHI’s Leap Not Creep. Those teams will receive the training as part of the second phase of EDC.

“The course helps to structure the thought process,” says Nelda Bravo, team leader for international outreach in FHWA’s Office of International Programs. “Getting things you may know intuitively into a formal plan makes it much easier to communicate to others what you’re trying accomplish and get everyone onboard.”

FOR MORE INFORMATION ON HIGHWAYS FOR LIFE, VISIT WWW.FHWA.DOT.GOV/HFL. FOR MORE ON EDC, VISIT WWW.FHWA.DOT.GOV/EVERYDAYCOUNTS. TO ENROLL IN NHI TRAINING, PLEASE GO TO WWW.NHI.FHWA.DOT.GOV.



Instructor Chris Huffman describes the process of implementing innovations at a session of the NHI course 134073 Leap Not Creep: Accelerating Innovation Implementation.

Credit: Jessica L. Fonoroff, ICF International

Virtual Foundation Expo

NHI uses technology to connect remote participants to conference event in real time

More than ever, State departments of transportation (DOTs) are looking to cut costs and work as efficiently as possible. Despite the inherent value of participating in conferences and training events in person, sometimes the travel budget just isn't there, or the time away from the office might stretch staff resources too thin. But what if there was a way for DOT staff to not only attend but also actively participate in a conference without leaving the office? The National Highway Institute (NHI) recently piloted a way to do just that.

At the International Association of Foundation Drilling's (ADSC) 2012 Expo in San Antonio, TX, in March 2012, NHI conducted a virtual conference component that enabled State DOT staff to virtually attend the event as avatars, or digital representations of themselves. From their offices, each person—

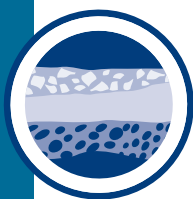
or groups of staff in most cases—could listen to presentations, participate in question and answer sessions, and access other multimedia resources all through their computers.

Silas Nichols, principal geotechnical engineer with the Federal Highway Administration (FHWA) approached NHI with the goal of connecting more State DOTs to valuable industry knowledge offered at conferences. "Many States have policies and reduced budgets that limit travel outside of their States," says Nichols. "We saw an opportunity to explore technologies that would enable States to receive pertinent information and gain access to industry experts in a cost-effective manner."

Louisa Ward, NHI's training program manager for the geotechnical and structures programs, researched several virtual world platforms and sought to acquire access to a browser-based, low-cost, and 3-D virtual world platform with simple features. With support from the National Defense University, NHI was able to conduct the pilot using its 3DXplorer virtual conference room. Over a 2-day period, this virtual auditorium space connected 22 State DOTs and Federal lands agencies, approximately 150 remote participants, with 20 industry experts from the ADSC Expo in San Antonio.

The first day of the Virtual Foundation Expo consisted of a series of panel discussions focused on the latest foundation technologies. Panelists covered topics including techniques for large- and small-diameter hole excavations and slurry technology. Using their avatars, remote participants posed questions for the Q&A sessions with panelists, engaged in conversations with the panelists, and participated in private chat sessions with NHI staff.

"It was important for us in the design of the Virtual Foundation Expo to focus it around our virtual participants and tailor it to their needs," says Meredith Perkins, senior instructional system designer at Sevatec, Inc., a contractor for NHI. "We wanted to



During the Virtual Foundation Expo, attendees from various State DOTs and FHWA field offices participated in the event remotely, represented by avatars in the virtual auditorium shown here.

make sure that our participants were not passively watching events taking place at the conference, but instead were actively involved in a format that was appropriate to the virtual world delivery method.”

During the second day, NHI, with support from FHWA multimedia specialist Ron Toole, streamed a live video broadcast of foundation experts speaking during the general session at the 2012 ADSC Expo. Those speakers then joined participants in the virtual world during a special post-presentation Q&A session. Throughout the event, NHI hosted short videos on the Web that featured equipment showcased at the San Antonio conference, as well as interviews with manufacturers who provided up-to-date information about the latest in drilling technologies.

State DOT engineers and geotechnical specialists involved with the planning, design, and construction of surface transportation facilities reported that they had the opportunity to keep up with developments in their field without taking time away from their day-to-day work for travel. “Multiple folks in our department were able to attend and engage at a conference we otherwise would have had no chance to attend,” says Michael McDonnell, P.E., transportation supervising engineer with the Connecticut Department of Transportation.

Interest in developing future applications for this technology continues to build in the months following the Virtual Foundation Expo. The potential for its use extends beyond conferences. NHI plans to incorporate more virtual elements into NHI training and virtually link interested audiences with other important events in their fields of expertise. NHI also is exploring expanding participation beyond State DOTs to include others in the transportation field.

FOR MORE INFORMATION, CONTACT LOUISA WARD AT (703) 235-0523 OR LOUISA.WARD@DOT.GOV.



Panelists are addressing participants in the virtual world. The screen behind the panelists links to the video repository, where participants can view demonstration videos.



Here, participants wait in the virtual world for a speaker to join them for a post-presentation Q&A session.

Federal-Aid Essentials

With an extensive video library and other resources, this FHWA Web site helps local public agencies manage their highway projects successfully

Let's say you're responsible for managing your town's highway program. You've just received \$2 million in Federal-aid funding to help with a major construction project, but you have questions about the latest requirements regarding contract administration and how to address the environmental impacts of the project. Where do you turn for answers?

In the past, finding accurate, up-to-date information about the requirements of the Federal-Aid Highway Program could involve thumbing through thick manuals or digging around in documents scattered across various Web sites. To simplify the process, the Federal Highway Administration (FHWA), in coordination with its State and local partners, created a new online resource called Federal-aid Essentials for Local Public Agencies. The Web site features an extensive list of short videos on key topics including civil rights, environmental issues, finance, right-of-way, and project development, as well as links to Federal, State, and other resources designed to help busy local public agency staff quickly find relevant policies, procedures, and best practices.

Across the United States, local public agencies are charged with managing some 2.9 million miles (4.7 million kilometers) of road. That's about three-quarters of the Nation's roadway network. Of the nearly 28,000 local public agencies in the United States, each year an estimated 7,000 of them are actively managing about \$7 billion in Federal-aid projects—roughly 15 percent of the total Federal-Aid Highway Program—to help them build, maintain, and operate roads.

"Along with administering the allocation of funding, these agencies assume responsibility for adhering to all Federal laws and regulations governing the program," says Bernetta Collins, director of FHWA's Resource Center. "That's where Federal-aid Essentials comes in. This centralized resource library can become a local agency's personal reference library, available 24 hours a day, providing access to critical information that can help ensure successful project implementation."

The backbone and showpiece of Federal-aid Essentials for Local Public Agencies is its video library covering most aspects of the process of project development and delivery. Each short video addresses a single topic presented in plain language, condensing the complex regulations and requirements of the Federal-Aid Highway Program into easy-to-understand

concepts and illustrated examples. Once the user selects a category, such as Environment, a menu of videos for that category appears next to the video viewing screen. Users simply click on the desired video title and the presentation begins.

From the same page, users can access a number of companion materials, including a printable transcript of each video, reference information, and links to additional resources, including the applicable section of the Code of Federal Regulations. Another function enables users to share feedback on a particular video, the resource library, or the Web site in general. The videos are accessible on any computer or mobile device with Internet access.

The State Resources button, located on the main page, provides access to a list of contacts at the FHWA division offices and State departments of transportation, as well as links to State manuals for local public agencies and Local Technical Assistance Program (LTAP) centers. Another dropdown menu on the lower part of the main page, titled "I want to know more about..." lets users find information about most Federal-aid topics quickly and conveniently.

The goal is to provide the right information at the right time for transportation staff at the local level. By centralizing this information, Federal-aid Essentials for Local Public Agencies provides transportation professionals with a convenient way to access information vital to administering Federal-aid projects. Ultimately, this information will help ensure that local agencies have the knowledge and tools they need to deliver transportation projects faster and more cost-effectively.

VISIT WWW.FHWA.DOT.GOV/FEDERAL-AIDESSENTIALS FOR MORE INFORMATION.



Sample Topics in the Video Library

Federal-aid Program Overview

- Stewardship and Oversight
- A Process from “Cradle to Grave”
- Key Actions in the Cradle to Grave Process
- Funding Basics and Eligibility
- Project Requirements
- National Bridge Inspection Standards
- Consultant Services Overview
- Hiring a Consultant Using Competitive Negotiation Procedures
- Organizational and Consultant Conflicts of Interest

Civil Rights

- Background and Purpose
- Nondiscrimination Requirements on Construction Contracts
- Foundations of the ADA/Section 504
- Transition Plans
- Self-Evaluation Basics
- [DBE] Program Overview

Environment

- Overview of NEPA as Applied to Transportation Projects
- Documentation and the Environmental Process
- NEPA Compliance and Class of Actions
- Categorical Exclusion
- Environmental Impact Statement
- Environmental Assessment
- Purpose & Need, and Alternatives
- Public Involvement
- Agency Coordination
- Mitigation of Environmental Impacts and Environmental Commitment Compliance

Finance

- Introduction to Cost Principles
- Common Grant Rule
- Transparency Act Sub Award Reporting
- Internal Control Regulations and Requirements
- Introduction to Internal Control
- Single Audit (OMB Circular A-133)
- Developing an Indirect Cost Allocation Plan
- Matching or Cost Sharing Requirements
- Advance Construction

Right-of-Way

- Introduction to Right-of-Way Requirements and the Uniform Act
- Project Development
- Property Management
- Valuation
- Acquisition and Negotiation
- Relocation Assistance

Project Development

- Projects and Statewide Planning Requirements
- Cost Effectiveness Determinations and Public Interest Findings
- Selecting the Method of Construction: Contract or Force Account
- Project Advertisement, Bid Review, and Request for Concurrence in Award
- Project Geometric Design Requirements
- Environmental Requirements
- Value Engineering Requirements for Federal-aid Projects
- Bike and Pedestrian Accommodation
- Pedestrian Accessible Design Requirements
- Form FHWA-1273

Project Construction and Contract Administration

- Introduction to Project Construction and Contract Administration
- Supervising Agency Requirements
- Construction Quality Assurance
- Design-Build Procurement
- Project Closeout
- Contract Time and Schedule Management
- Change Orders
- Buy America Field Compliance
- Job Site Posters

Customizing Instructor-Led Training

NHI goes the extra mile to tailor content to local audiences

Know your audience. This is a key principle when developing and delivering training courses. For more than 40 years, the National Highway Institute (NHI) has provided training to a broad range of transportation industry professionals—from engineers to planners to environmental specialists. Content that is relevant to the target audience is critical to maximizing the value of a course to the end user and, ultimately, to facilitating more effective planning and implementation of transportation projects. One example of NHI's commitment to customizing content to specific audiences is delivery of course 142049 Beyond Compliance: Historic Preservation in Transportation Project Development.

The course presents the fundamentals of Section 106 of the National Historic Preservation Act, which requires Federal agencies to take into account the effects of their projects on properties listed in or eligible for the National Register of Historic Places, and places them in context with other environmental requirements. The course also examines effective practices that integrate the Section 106 process with the requirements of the National Environmental Policy Act (NEPA) and Section 4(f) of the Department of Transportation Act of 1966.

A critical component of compliance involves balancing historic preservation concerns with the needs of Federal undertakings through consultation with resource agencies, stakeholders, and the public during transportation planning and early project development. Therefore, the course provides information about consulting effectively with these audiences, as well as federally recognized Native American tribes and taking into account their varied religious and cultural values.

Prior to each session, NHI instructors work with the staff of the hosting organization, such as the State department of transportation, to incorporate and address issues and concerns related to local historic preservation and project delivery needs. For example, instructors delivering sessions of course 142049 in Anchorage, Fairbanks, and Juneau, AK, added to the curriculum content and discussions related to consulting with Native Alaskans. For a session delivered in California, instructors included a discussion on



The Hana Highway, a popular road for tourists, includes a series of historic one-lane bridges such as the one shown here. The road's historic and environmental features exemplify the types of complex issues that prompted the Hawaii Department of Transportation to request customized sessions of course 142049.

Credit: Lynne Sebastian, SRI Foundation

how to implement the Section 106 process in terms of the California Department of Transportation's NEPA delegation. Yet another session, this one in Oklahoma, included discussions on managing historic bridges in the context of project delivery, a topic of concern for course participants in that State.

Before presenting sessions in Hawaii, NHI customized 142049 to reflect the State's existing transportation programs and procedures for meeting local historic preservation goals, including working with Native Hawaiian organizations. The National Historic Preservation Act defines Native Hawaiian organizations as "any organization [that] serves and represents the interests of Native Hawaiians; has as a primary and stated purpose the provision of services to Native Hawaiians; and has demonstrated expertise in aspects of historic preservation that are significant to Native Hawaiians." These organizations play a major role in transportation planning in the State. NHI worked closely with the Hawaii DOT and the Federal Highway Administration's (FHWA) Hawaii Division to incorporate into the course curriculum materials and information specific to consulting with these organizations.

"Native Hawaiian organizations are different from tribes because they are not structured governments that qualify as nations recognized by the Federal government," says MaryAnn Naber, Federal preservation officer with FHWA. "Any organization that serves and represents the interests of Native Hawaiians as a primary function and has demonstrated expertise in aspects of historic preservation that are culturally significant to Native Hawaiians may participate in the process. Special diligence must be observed to ensure that the consultation is inclusive, so we customized the course to address their specific role in the process. We wanted to make it relevant to those in Hawaii, so we changed case studies, images, and one whole unit to apply specifically to Native Hawaiian organizations."

Pat Phung, lead civil engineer with the FHWA Hawaii Division, found the customization extremely helpful in making it applicable to Hawaiian transportation projects. "The course brings higher awareness to the challenges and opportunities of working with Native Hawaiian organizations," says Phung. "It addresses significant places of worship, historic sites, and geographic features that we try to avoid or where we at least minimize our footprint. The course even included Hawaiian words and local issues that made it real for participants."

The needs of transportation professionals vary across the country. When planning to schedule your next NHI training, ask your session registrants what "hot topics" they would like addressed and have this information

available when the NHI instructors contact you to discuss logistics. It is also helpful to provide Web links to local guidance documents, policies, or procedures that are related to your NHI course. Even though NHI training is designed for a national audience, the organization strives to customize courses, as content allows, to make participants' learning experiences even more valuable.

TO SCHEDULE A SESSION OF THIS COURSE AND OTHERS, VISIT THE NHI WEB SITE AT WWW.NHI.FHWA.DOT.GOV. NHI COURSES THAT OFFER OPTIONAL MODULES AND OPPORTUNITIES FOR CUSTOMIZATION INCLUDE THE FOLLOWING: 130053A, 380034, 132069, 132070, AND 132080.

NHI Offers Free Smartphone App for Pavement Preservation

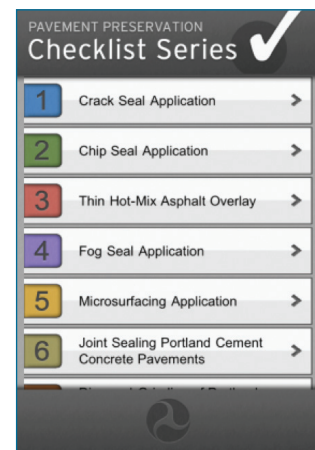


The new mobile application provides easy access to key FHWA checklists

Information is most valuable when it is easily accessible. To help pavement inspectors access critical information in the field, the National Highway Institute (NHI) now offers a smartphone app featuring a digital version of the *Pavement Preservation Checklist Series*, which is among the most requested pavement-related paper documents ever produced by the Federal Highway Administration (FHWA). The new app is now available for Android™ and BlackBerry® smartphones.

Pavement preservation is a systematic approach to extending pavement life, reducing highway expenditures, increasing roadway safety, and improving customer satisfaction. An effective preservation program requires selecting suitable projects, using the right materials, and placing the treatments at the right time. To help State and local maintenance and inspection personnel meet those requirements, FHWA partnered with the Foundation for Pavement Preservation to compile a series of 14 checklists on topics such as crack sealing, chip sealing, hot and cold in-place recycling, diamond grinding, and full- and partial-depth repair of portland cement concrete. Each topic includes reminders, cautions, and other tips on key pavement preservation details, including documentation, materials, equipment, and site conditions.

"These checklists help transportation professionals adhere to best practices while maintaining U.S. highways," says Marty Ross, a training program manager with NHI. "The checklists—along with other relevant training opportunities from NHI—can be an essential part of maintenance and inspection workers' resource toolkits."



To date, the hardcopy checklists have provided thousands of users with timely reminders of all the details that need to be addressed to complete a successful pavement preservation project. Now that these helpful checklists have been converted into downloadable apps for Android™ and BlackBerry® devices, transportation professionals in the office and in the field will have immediate access to current and technically accurate information on pavement preservation.

THE APP IS AVAILABLE FOR DOWNLOAD AT NO COST BY SEARCHING "FHWA" AT THE APP STORE FOR YOUR DEVICE. FOR MORE INFORMATION ABOUT ALL OF NHI'S CONSTRUCTION AND MAINTENANCE TRAINING SESSIONS, VISIT THE NHI WEB SITE AT WWW.NHI.FHWA.DOT.GOV.

Announcing the 2011 Instructors of Excellence Awards

NHI recognizes the year's top-rated trainers

Educating the transportation workforce requires a team of knowledgeable instructors with years of on-the-job experience and a talent for training others. Thankfully, the National Highway Institute (NHI) has more than 500 of them. Whether employed by the Federal Highway Administration (FHWA) or a contracting firm, NHI's instructors are committed to offering top-notch training to the Nation's transportation workforce.

Since 2008, NHI has presented annual Instructors of Excellence Awards to recognize those instructors who have gone above and beyond in delivering high-quality instruction. Once again, NHI is pleased to honor the year's top performers.

Here's a sampling of what training participants had to say about the 2011 honorees:

- "Great at connecting with the audience and sharing real-life experiences."
- "Good balance of experience and personalities."
- "Great energy and kept me focused and invested throughout the class."
- "Effective examples from personal experience to help explain answers to questions."

To earn this distinction, instructors must consistently achieve rankings of 4.5 or above (on a 5-point scale), be approved by an NHI training program manager, attend and successfully complete the NHI Instructor Development Course, and achieve or be in the process of achieving NHI Instructor Certification.

"Each year presents a new opportunity for all government agencies to exceed the expectations of their customers," says NHI Instructor Liaison Carolyn Eberhard. "This year our instructors have again surpassed their excellent service to NHI and the transportation community in delivering training that is essential to maintaining and upgrading our Nation's infrastructure. I would like to congratulate each recipient and thank them personally for their extraordinary work."

FOR MORE INFORMATION, VISIT THE NHI WEB SITE AT WWW.NHI.FHWA.DOT.GOV, OR CONTACT CAROLYN EBERHARD AT (703) 235-0952 OR CAROLYN.EBERHARD@DOT.GOV.

Instructor Profile: Jeff Rowe

Jeff Rowe, senior vice president at Infrastructure Engineers, finds that teaching an old dog new tricks is one of the most rewarding aspects of being an NHI instructor. With 7 years of NHI instruction under his belt, Rowe currently teaches sessions of 130053 Bridge Inspection Refresher Training and 134063 Maintenance Leadership Academy, and previously taught 130091 Underwater Bridge Inspection. He also helped develop all three courses.

"I really enjoy being able to instruct participants who have been involved in the transportation industry for many years and to have them come up at the end of class and tell me that they not only enjoyed it but actually learned something new," Rowe says. He recalls that one participant, who had more than 40 years of experience, handed in a note at the end that said the course was one of best he'd ever taken and that he'd "learned many new things and had a wonderful time doing it."

A career bridge inspector, Rowe was bitten by the teaching bug when he served as an adjunct professor at The Citadel in Charleston, SC, where he taught engineering management. He had taken courses in adult learning techniques and applied them in his college course. Interactive techniques like a Jeopardy quiz game were a big hit with the students. "They loved it," he says. "Seniors said they'd never had a class like that before."

The experience at The Citadel opened his eyes to teaching, but he didn't want to do it full time. "Working with NHI enables me to tap into the fun and joy of instructing in an area I'm passionate about—bridge inspection—without having to do it full time." And that enthusiasm for his craft comes across in class. To be a good instructor, "first and foremost, you've got to have fun," he says. "If you are passionate about what you are teaching, it will come through, and the participants will want to pay attention and learn." On more than one occasion participants have said to him, "I'd love to go do a bridge inspection with you."

2011 Instructors of Excellence	
Instructor	Company
Stephen Seeds	Applied Pavement Technology, Inc.
Kurt Smith	
James Bakken	Ayres Associates
Paul Clopper	
John Hunt	
Jerry Richardson	
James Schall	
Terence Browne	Collins Engineering, Inc.
Thomas Collins	
Richard Albin	FHWA
Adam Alexander	
Craig Allred	
Mark Doctor	
Michael Duman	
Jerry Ellerman	
Thomas Elliott	
Peter Eun	
Veronica Ghelardi	
Scott Hogan	
Steven Jessberger	
Frank Julian	
John McFadden	
George Merritt	
W. Curtis Monk	

continued on next page

Advice to other instructors? “As soon as you can, get away from the podium and your notes,” he says. “Moving around the room keeps participants engaged. And, take the time to keep up with the industry. I spend several hours each week keeping up to date on the latest developments in bridge inspection. It really helps validate your expertise for participants when you can share with them the latest developments.”

As part of his day job, Rowe is a commercial diver doing underwater bridge inspections. He also enjoys diving for sport, as well as swimming, biking, and backpacking. When away from the office and classroom, he spends most of his time with his wife and seven children, a couple of whom he’s inspired to take up diving with him!

NHI congratulates Rowe for his years of service and for being honored with a 2011 Instructor of Excellence Award.



Jeff Rowe, NHI 2011 Instructor of Excellence, is in a dry suit preparing to perform an underwater bridge inspection.

Credit: Jeff Rowe, Infrastructure Engineers

Reginal Keith Moore	FHWA
MaryAnn Nabor	
Ralph Volpe	
William Fitzgerald	GP Strategies Corporation/PerformTech, Inc.
Chris Huffman	
LeAngela Ingram	
Dane Ismart	
Gerald Kennedy	
Charlie O'Connell	
Margaret Parkhill	
Dee Spann	
Gary Thomas	
Betty Wilken	
Gregory Hostettler	
Christopher Howard	
David Reser	
Jeffery Rowe	
Andrew Young	
Dennis Jackson	KBA, Inc.
A. Tamim Atayee	Kilgore and Associates
Roger Kilgore	
Diane Nulton	McCormick Taylor
Darrell Burnett	Metric Engineering
Dennis Baughman	Michael J. Baker, Jr., Inc.
Milo Cress	

Instructor Profile: Lisa Barnes

Since 2005, Lisa Barnes has helped NHI train Federal, State, and local agency personnel on the ins and outs of relocating residents and businesses displaced as a result of federally funded transportation projects. Barnes is vice president for ORC Training, an affiliate company of O. R. Colan Associates.

"I had attended several NHI courses previously and was always impressed with the quality of the course material and the instructors," she says. "And, I had been teaching real estate and right-of-way courses for 20 years, so joining NHI's instructor team was a great next step for me."

Barnes teaches NHI's three relocation courses: 141029 Basic Relocation under the Uniform Act, 141030 Advanced Relocation under the Uniform Act, and 141031 Business Relocation under the Uniform Act, as well as 141050 Introduction to Federal-Aid Right-of-Way Requirements for Local Public Agencies. She instructs an average of five sessions per year.

"I love teaching and being in the classroom," she says. "The most rewarding thing is realizing that the information shared through discussion and case studies really makes a difference in the way people perform their jobs."

One of her favorite things about instructing for NHI is meeting people from so many different agencies and parts of the country and hearing about the ways they implement the Federal-aid right-of-way program. "Seeing how people work together to solve problems is always a learning experience for me," she says.

Succeeding as an NHI instructor requires embracing the organization's learner-focused training. "NHI's training is not about how much we know as instructors," she says. "It's about whether we can successfully engage the adult learner and transfer our expertise and experience in a meaningful way."

In the arena of relocation and real estate, sometimes transferring the right knowledge to a specific audience is easier said than done. "Adjusting course content to accommodate particular laws, regulations, or policies

Andrew Fickett	Michael J. Baker, Jr., Inc.
William Gardener	
James Gundry	
Guy Lang	
J. Eric Mann	
Thomas Ryan	
John Wackerly	
Elissa Barnes	O. R. Colan, Inc.
Robert Kleinburd	
Robert Merryman	
Theodore Pluta	Parsons Brinckerhoff
Daniel Brown	
Robert Bachus	Ryan R. Berg and Associates, Inc./Geosyntec Consultants
Burak Tanyu	
Barry Christopher	Ryan R. Berg and Associates, Inc.
Theodore Petritsch	Sprinkle Consulting, Inc.
Bruce Landis	
Kathy Baumgaertner	SRI Foundation
David Cushman	
Terry Klein	
James Collin	The Collin Group, LTD
Brian Furniss	Trauner Consulting Service, Inc.
J. Scott Lowe	
Mark Nagata	
Frank Brewer	University of Tennessee
Richard Gumtau	

that a host agency may have in addition to the ones we typically discuss can be challenging,” Barnes says. But taking that extra time upfront to tailor the material to the intended audience is critical. “Participants want and need to know how this information directly affects them and their jobs.”

How does she do it? “You do your homework and be prepared,” she says. “Talk to the host agency ahead of the session, find a subject matter expert in the area to explain what issues are important, and make the session relevant for the participants.”

Like many instructors, Barnes travels quite a bit for work, and she likes to make the most of each trip. “I try to bring my family with me when possible so we can experience the diversity of the United States together.” Back home in Tallahassee, FL, you might find her and her husband relaxing on the deck, surrounded by flowers and their two cats and two dogs.

NHI congratulates Barnes for her years of service and for being honored with a 2011 Instructor of Excellence Award.



Lisa Barnes (in red shirt), NHI 2011 Instructor of Excellence, is shown with her daughter Hilary, husband Sam, and son Matt at the Chihuly Garden and Glass museum in Seattle, WA, in June 2012.

Credit: Lisa Barnes

NHI Wins National Award from ACEC

LRFD reference manual receives recognition for engineering excellence



“A breakthrough resource for the engineering community worldwide.” That’s how the American Council of Engineering Companies (ACEC) describes a reference manual developed jointly by the Federal Highway Administration (FHWA), the National Highway Institute (NHI), and contracting firm Michael Baker Jr., Inc. The document, *Analysis and Design of Skewed and Curved Steel Bridges with LRFD*, earned ACEC’s 2012 Engineering Excellence Honor Award.

In its awards program, ACEC officials go on to say that this “new comprehensive manual for designing curved and skewed steel bridges provides a critically needed industry resource where none previously existed...[This] first-of-its-kind 1,470-page manual... provides a seamless blending of theoretical instruction and practical design examples benefitting both the novice and seasoned engineer.”

The manual was developed through NHI under the technical direction of Dr. Firas I. Sheikh Ibrahim, team leader for infrastructure management in FHWA’s Office of Infrastructure Research and Development.

Based on the American Association of State Highway and Transportation Officials’ AASHTO LRFD Bridge Design Specifications (5th Edition, 2010), the manual incorporates load and resistance factor design (LRFD) guidance into the unique requirements for the design and fabrication of curved and skewed steel bridges.

“This document will serve the industry for decades in producing bridges with uniform safety and reliable service life, and minimize the risk for problems during construction,” says Ibrahim.

In addition to the reference manual, the team developed an instructor’s guide, course participants’ workbook, and training presentation. FHWA and NHI offer a comprehensive LRFD training program that includes three courses: 130095 LRFD and Analysis of Curved Steel Highway Bridges, 130095A Fundamental and Structural Analysis for Curved and Skewed Steel Bridges, and 130095B Design and Fabrication of Curved and Skewed Steel Bridges. Portions of the manual form the foundation of these courses, and members of the development team conduct the training.

ACEC has been presenting its prestigious awards for engineering excellence since 1967; winners are chosen on the basis of uniqueness and innovative applications, and future value to the engineering profession, among other criteria. “A Federal document receiving recognition from ACEC is an indication that FHWA and NHI have filled a knowledge gap,” Ibrahim adds. “This document is a tribute to the team of private and Federal researchers, technical experts, and educational specialists for their expertise and contributions to this highly specialized area.”

Louisa Ward, NHI training program manager for structures, geotechnical, and hydraulics programs and lead facilitator for the project, concurs: “This award affirms NHI’s commitment to excellence in education for the transportation community. It’s an honor to be recognized by industry professionals who see the importance of this manual to highway bridge engineering technology and knowledge.”

At the ACEC’s Engineering Excellence Awards Gala, attended by more than 600 in Washington, DC, on April 17, 2012, Ibrahim and Ward accepted the award on behalf of FHWA and NHI, respectively.

THE MANUAL IS PROVIDED TO PARTICIPANTS OF THE COURSE 130095 LRFD AND ANALYSIS OF CURVED STEEL HIGHWAY BRIDGES AND ALSO IS AVAILABLE FOR PURCHASE FROM THE NHI STORE AT WWW.NHI.FHWA.DOT.GOV.



(From left) FHWA’s Louisa Ward and Dr. Firas I. Sheikh Ibrahim accept the 2012 ACEC Engineering Excellence Award, along with Scott Vannoy and Ken Wilson of Michael Baker Jr. Inc.

Credit: Michael Baker Jr. Inc.

New and Updated Courses Launched in 2012

NHI is continuously developing and delivering new and updated courses to ensure the highest quality training and help improve the transportation industry. Listed below are just a few examples of the courses NHI launched or updated in 2012.

Instructor-Led Training	
Course Title	Course Number
Safety Inspection of In-Service Bridges	130055
Cable-Stayed Bridge Seminar	130096
Asphalt Pavement In-Place Recycling Technologies	131050
Spread Footings: LRFD Design and Construction	132037
Utility Coordination for Highway Projects	134006
Stream Stability and Scour at Highway Bridges	135046
Culvert Design	135056

Web-Based Training	
Course Title	Course Number
TCCC Superpave for Construction	131134
TCCC Aggregate Sampling Basics	131135
TCCC Materials Testing: Reducing Aggregate Samples	131136
Introduction to Safety Inspection of In-Service Bridges	130101
Principles of Evacuation Planning Tutorial	133107
Strategies for Developing Work Zone Traffic Analyses	133110
Safe and Effective Use of Law Enforcement Personnel in Work Zones	133119
Basic Hydraulic Principles Review	135091
Highway Traffic Noise: Basic Acoustics	142063
FHWA Planning and Research Grants: History, Sources, and Regulations	151046
FHWA Planning and Research Grants: Common Grant Rule	151047
FHWA Planning and Research Grants: Cost Principles	151048
FHWA Planning and Research Grants: Audits	151049
Highway Safety Manual Online Overview	380106
Highway Safety Improvement Program Overview	380110
Strategic Highway Safety Plan Development	380113

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Construction and Maintenance
Design and Traffic Operations
Environment
Financial Management
Freight and Transportation Logistics
Geotechnical
Highway Safety
Hydraulics
Intelligent Transportation Systems (ITS)
Pavement and Materials
Real Estate
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