

2011

NHI Training in Action

*Improving the Performance
of the Transportation Industry
Through Training*



Inside:

- Celebrating 40 Years of Service
- Partnering with NHI
- Web Site Refresh
- Award-Winning Achievements

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-based 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 or contact the NHI Training Team at nhitraining@dot.gov.

NHI Course Categories



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Left: In April 2010, NHI moved into its new home at 1310 North Courthouse Road in Arlington, VA.

launched its Web site, providing customers quick and easy access to the entire catalog and an array of other training-related information.

Then, in 2003, NHI launched its first Web-based training, offering a lower cost, self-study option that enables participants to learn at their own pace wherever they can access the Internet. Soon after, NHI launched Web-conference training, in which participants join live training online at a set time. And, with the recent launch of the NHI Store, the transportation community now can order copies of training materials online. These online services give NHI the ability to reach more people, more efficiently.

To capitalize on diverse skill sets and experiences, NHI regularly collaborates with partners across the industry to enhance the quality and value of its courses. For example, NHI is accredited by the International Association for Continuing Education and Training (IACET) as an authorized provider of continuing education units (CEUs). As an authorized provider, NHI can offer CEUs for its courses that qualify under the American National Standards Institute/IACET 1-2007 Standard, which “gives them validity as high-quality trainings,” says NHI Instructor Liaison Carolyn Eberhard.

NHI also forges close relationships with internal FHWA groups, such as the Resource Center, and external groups, such as the American Society of Civil Engineers, Deep Foundations Institute, State departments of transportation, and university transportation centers. Because of the global nature of transportation today, NHI reaches beyond the Nation’s borders to develop relationships with transportation professionals around the world. In fact, for more than 20 years, NHI and FHWA’s Office of International Programs have collaborated to provide training resources, briefings on training processes, and Web-based training to dozens of countries, including Iraq, Korea, and Kuwait.

NHI is constantly striving to not only improve its courses but also provide up-to-date training facilities for delivering them. In April 2010, NHI relocated its headquarters in Arlington, VA, to a newer facility that offers modern classroom spaces to accommodate both instructor-led and Web-conference training.

Perhaps NHI’s most notable accomplishment is the change it has inspired within the transportation community. “NHI’s work has resulted in changes—the way people design bridges, the way people build safety into our roads, the way they involve the public in transportation decisions, and much more,” says Toole. “All of these advancements have improved our Nation’s roadways, and NHI has played a significant role in making that happen. I am confident that NHI will continue to grow and evolve, and that the NHI of 2019 will not be the NHI of today. But I am also confident that as long as there is a need, NHI will be there, ready to meet it.”

Celebrating 40 Years of Service

NHI continues its legacy of delivering high-quality training to the transportation workforce

When the National Highway Institute (NHI) first opened its doors in 1970, it was just a small operation, with a handful of employees who completed every course registration, every scheduling arrangement, and every certificate by hand. Understandably, the menu of courses was fairly narrow, covering subjects such as work zone safety, pavements, and hydraulics.

Since then, NHI’s course catalog has expanded to include hundreds of trainings in 16 broad categories ranging from structures and pavements to real estate and communications. In addition, NHI now offers more than 50 distance learning courses, making it feasible for transportation professionals to attend training from the comfort of their own offices, without the hassle and cost of travel. Although NHI has grown tremendously over the last four decades, one thing has remained constant: NHI’s commitment to quality. Whether developing exceptional training materials or securing topnotch instructors, quality remains at the core of NHI’s values.

One of the main contributors to NHI’s success is the fact that the Federal Highway Administration (FHWA) “places a high value on learning within the context of professional and corporate development,” says FHWA Associate Administrator for Safety Joe Toole, who previously served as associate administrator of the Office of Professional and Corporate Development. With FHWA’s support, NHI has correspondingly multiplied its ability to offer high-quality training. In the words of NHI Training Director Rick Barnaby, “NHI’s mission hasn’t changed; the organization has just expanded in new directions to meet new challenges and opportunities.”

One of the most important ways in which the organization has evolved is through the adoption and adaptation of new technologies. In 1992, NHI launched its Course Management and Training System (CMTS), a computer program that stores information about NHI courses, including development milestones, attendance data, and contract funding levels. In the late 1990s, NHI



Then-Federal Highway Administrator Francis C. Turner (left) poses with Emmett H. Karrer, the first director of NHI, in September 1971.

NHI Web Site Gets a Makeover

New interface and features improve the site's accessibility and function

The National Highway Institute (NHI) is continually striving to improve its training courses and the ways in which they are delivered. Over the last few years, demand has risen for NHI trainings to be Web-based and accessible anywhere and at any time. For this reason, NHI has offered more and more Web-based, distance learning courses each year and has moved all course registration and material purchasing functions online. With the growing importance of the Web site as a hub for all things NHI, the organization

knew that an improved site style and navigation were vital to continuing to deliver high-quality customer service. NHI reached out to its site users through a usability study—targeted research delivered through interviews with NHI customers—for feedback on how the site could be improved.

“Within the last few years, there has been an increase in the number of customers who felt the Web site lacked important information, or they had trouble finding information due to the site’s unclear processes and missing features,” says Josh Kersey, a management consultant who helped lead the redesign. NHI used the results of the usability study to prioritize updates to the design, features, functionality, and content of the Web site. These updates have enhanced NHI’s online presence and provided more accessible resources for course hosts, participants, and instructors.

The majority of the redesign process was completed at the end of 2010, but the final phases will continue over the next few years. The significant features that were redesigned include improved sign-on functionality and updates to the home page style and navigation. The improved features enhance the user experience, as well as increase Web site capabilities—making login, scheduling, searching, and completing NHI trainings easier for all users.

“Today’s Web users expect a higher level of functionality, especially since so many now rely on Web-based training,” says Heather Shelsta, NHI’s program manager for systems and marketing. “The redesigned site will meet such demands—and, we hope, exceed them.”

The first phase of updates, completed in March 2010, included implementing “My Training,” a single sign-on feature. The new feature directly launches Web-based and Web-conference trainings on the site, and enables customers to view a list of Web-based and Web-conference trainings they have scheduled and those they have already taken. “My Training” also allows customers to access and download training documents (for Web-based and Web-conference trainings only), such as personalized certificates for successfully completed courses and electronic

materials ordered from the NHI Store. Through “My Training,” customers also can request an official transcript from the NHI Registrar.

During the second phase of updates, completed in August 2010, NHI launched the home page and navigation redesign. The updates included changes to home page fonts, colors, and images; a new left-side navigation bar and site map at the bottom of each page; navigation options in the center-right of the home page; and a course search box on each page, which enables site users to find courses on any page at any time.

The goal of the redesign’s second phase was to tackle the navigation and style issues on the original Web site, while maintaining all the strengths of the old site. For example, NHI retained several previous Web site features in the new design, such as displaying new courses on the home page, providing clear and informative course descriptions, maintaining an easy shopping and checkout process, and emailing updates to site users who sign up. NHI expects that the streamlined content and

simple design will not only give regular users increased accessibility to the information they need, but also attract new users and potential customers.

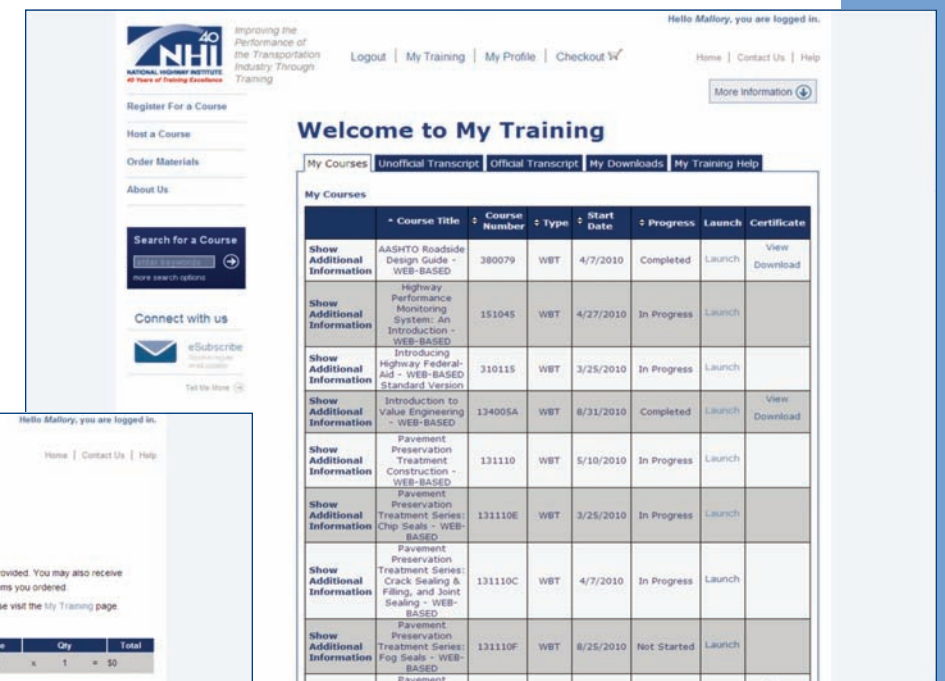
The remaining improvements also were developed based on the usability study, and NHI will implement these additional changes gradually. By the end of 2011, site users can expect to see updates such as Really Simple Syndication (RSS) feeds that enable customers to set preferences to receive email updates on specific NHI subject areas, print and share features, and improvements to the NHI Store to make downloading electronic documents faster and easier.

“Our mission at NHI is to improve the performance of the transportation industry through training, and our Web site is a critical tool for accomplishing this,” Shelsta says. “Using customer feedback, we will continue to guide the evolution of the Web site, as well as all NHI services, to meet the needs of the transportation community.”

CHECK OUT THE NEW NHI WEB SITE AT WWW.NHI.FHWA.DOT.GOV.



Screen shots from the newly refreshed NHI Web site.



Instructors of Excellence and Team Administrative Awards

Recognizing trainers for quality service in 2009

Enlisting topnotch instructors is critical to delivering the highest quality training. At the National Highway Institute (NHI), instructors from the Federal Highway Administration (FHWA) and its contractors bring real-world experience and deep technical knowledge to the frontlines to train the Nation's transportation workforce. For the third year running, NHI recognizes its top-performing instructors and administrative teams for their ongoing commitment to quality instruction.

"We, at NHI, are the beneficiaries of a highly motivated, exceptionally skilled cadre of professional instructors and educators," says NHI Training Director Rick Barnaby. "But the big win is for the transportation workforce."

Here's a sampling of what training participants had to say about 2009's top instructors:

- "Made the learning experience enjoyable and relevant."
- "Brought a fresh approach to the subject."
- "Related course material to real-life incidents."
- "Kept our attention, and good use of examples and anecdotes."
- "Suggested practical alternatives to problems experienced by participants."
- "Best course I've taken in my 32-year career."

To earn an award, instructors must consistently achieve participant satisfaction rankings of 4.5 or above (on a 5-point scale), be nominated by an NHI training program manager, attend and pass the NHI Instructor Development course, and achieve or be in the process of achieving NHI certification. Recipients of the Team Administrative Award are judged according to criteria including timely and accurate submission of session administrative packages, all instructors in the group maintain a minimum ranking of 4.5, instructors have completed the Instructor Development course, and instructors have achieved or are in the process of achieving NHI certification.

In 2009, the number of honorees hit an all-time high, with NHI recognizing 66 individual recipients and 6 teams. "I want to commend each of the instructors and teams," says NHI Instructor Liaison Carolyn Eberhard, "for their outstanding service, professional competence, and ethics in delivering training to the transportation workforce."

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.

2009 TEAM ADMINISTRATIVE AWARDS	
INSTRUCTOR	COMPANY
Kathryn Zimmerman	Applied Pavement Technologies
Dean Testa	
David Grachen	FHWA
Deborah Suci-Smith	
Joseph McKool	Infrastructure Engineering, Inc.
Sean Patrick	
Rick Donnelly	Parsons Brinckerhoff
Andrew Stryker	
Le'Angela Ingram	PerformTech
Nancy Rosenshine	
Mark Nagata	Trauner Consulting Services, Inc.

2009 INSTRUCTORS OF EXCELLENCE	
INSTRUCTOR	COMPANY
Dean Testa	Applied Pavement Technology
Katie Zimmerman	
Andrew Fickett	Ayers Associates, Inc.
John Hunt	
Peter Lagasse	
Johnny Morris	
Jerry Richardson	
James Ruff	
James Schall	
Jonathan Bartsch	
Louise Smart	Collin Group, LTD
James Collin	Collins Engineers
Terence Browne	FHWA
Kenneth Craig Allred	
Angel Correa	
Mark Doctor	
Michael Duman	
Frank Julian	
Owen Lindauer	
Keith Moore	
Larry O'Donnell	
Fred Ranck	
Jeff Shaw	
Douglas Townes	
Christopher Webster	
Stuart Stein	GKY
Christopher Huffman	Huffman Corridor Consulting Inc.
Joe McKool	Infrastructure Engineers
David Reser	
Jeffery Rowe	ITERIS
Richard Denney	
Tamim Atayee	Kilgore Consulting and Management
Roger Kilgore	
Bert Cossaboon	McCormick Taylor
Stephen Nieman	Metric Engineering
Darrell Burnett	
Milo Cress	Michael J. Baker, Inc.
Phillip Fish	
William Gedris	
George Gorrill, Jr.	
Ronald Ladyka	
J. Eric Mann	
Thomas Ryan	
John Wackerly	

2009 INSTRUCTORS OF EXCELLENCE	
INSTRUCTOR	COMPANY
Elissa (Lisa) Barnes	O.R. Colan
Robert Merryman	
Ted Pluta	Parsons Brinckerhoff
Dan Brown	
Susan Killen	
Steve Plano	Pavement Solutions
Dennis Jackson	
William Fitzgerald	PerformTech
Le'Angela Ingram	
Dane Ismart	
Charles O'Connell	
Carlene Reid	
Nancy Rosenshine	
Dee Spann	Ryan R. Berg, Associates
Patrick Hannigan	
Bruce Landis	Sprinkle Consulting Co.
Theodore Petritsch	The Keystone Center
Mike Hughes	
Brian Furniss	Trauner Consulting Services, Inc.
Scott Lowe	
Mark Nagata	H. C. Phoenix Group/Trauner Consulting Services, Inc.
Bruce Falk	
Gary Thomas	TTI
Paula Dowell	Wilbur Smith Associates

Partnerships Boost Training on Geotechnical Engineering

NHI, ASCE, and DFI collaborate to expand reach of transportation-focused courses

Specialized disciplines in the transportation industry, such as geotechnical engineering, often present training challenges. A major barrier in most States is the small number of practitioners, which makes it difficult to meet the minimum participant requirement to hold training courses. To address this particular challenge for geotechnical engineering, the National Highway Institute (NHI) partnered with the American Society of Civil Engineers (ASCE) and the Deep Foundations Institute (DFI) to provide enhanced geotechnical engineering training focused on designing and constructing transportation structures.

The partnerships call for selected courses from the NHI geotechnical curriculum to be offered through ASCE's Geo-Institute (G-I) and DFI. The arrangement provides more opportunities for government and consulting engineers and contractors involved in transportation work to attend technical training.

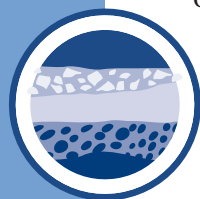
"We are thrilled about the partnerships with ASCE and DFI because of the potential to educate a larger portion of the engineering community," says Silas Nichols, a senior bridge engineer with the Federal Highway Administration's (FHWA) Office of Bridge Technology's Hydraulics and Geotechnical Team. "These partnerships will help us reach engineers and contractors working on transportation projects who otherwise might not have been able to attend the training."

The partnerships have the following goals:

- To advance the common mission of FHWA, DFI, and ASCE's G-I to provide more training and education for practicing engineers, technicians, contractors, and other geo-professionals.
- To establish a framework for coordinated delivery of NHI geotechnical engineering training through DFI and ASCE's G-I.
- To promote a coordinated effort to build the professional capacity of practitioners designing, constructing, and inspecting foundations and geotechnical features for roadways, bridges, and other transportation structures.

ASCE's G-I is a geo-industry-focused membership organization of scientists, engineers, technologists, and organizations interested in improving the environment, mitigating natural hazards, and constructing engineered facilities more economically. DFI is a technical

NHI Director of Training Rick Barnaby (front left) and DFI President Rudolph P. Frizzi (seated, right) sign the partnership agreement. (From back left) NHI Training Program Manager Louisa Ward, FHWA Senior Bridge Engineer Silas Nicols, and DFI Executive Director Theresa Rappaport also participated in the signing ceremony.



Amy Lucero (left), director of FHWA's Office of Technical Services, and John Casazza, ASCE managing director for continuing education, at the signing ceremony for the ASCE-NHI partnership agreement.



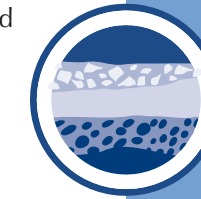
membership association of firms and individuals in the deep foundations and related industries. A significant percentage of both ASCE's G-I and DFI's memberships are involved in the design and construction of transportation facilities and need geotechnical training specific to FHWA-recommended guidance and policy—making each a natural fit for such a partnership with NHI.

"Partnering with FHWA to deliver NHI training is such a great opportunity for us to supplement our existing continuing education programs," says Theresa Rappaport, executive director of DFI. "We look forward to working together to provide this much-needed training for our members, arming them with the know-how to do their jobs successfully."

Likewise, ASCE's G-I Director Robert Schweinfurth says, "Our partnership with NHI will significantly enhance the professional knowledge of the Geo-Institute's and ASCE's members and other geotechnical

practitioners, and support their common goals of designing and constructing safer, longer lasting, and sustainable transportation infrastructure."

ASCE's G-I WILL POST INFORMATION ON ITS SCHEDULED NHI TRAINING, AS IT BECOMES AVAILABLE, AT WWW.GEOINSTITUTE.ORG. DFI WILL POST ITS NHI TRAINING SCHEDULE AT WWW.DFI.ORG/CONFERENCES.ASP. FOR MORE INFORMATION ON THE PARTNERSHIPS, CONTACT SILAS NICHOLS AT (202) 366-1554 OR SILAS.NICHOLS@DOT.GOV, OR LOUISA WARD AT (703) 235-0523 OR LOUISA.WARD@DOT.GOV.



NHI COURSES TO BE OFFERED THROUGH ASCE'S G-I AND DFI

ASCE's G-I	Driven Pile Foundations - Design and Construction (FHWA-NHI-132021)
	Driven Pile Foundations - Construction Monitoring (FHWA-NHI-132022)
	Drilled Shafts (FHWA-NHI-132014)
	Driven Pile Foundation Inspection (FHWA-NHI-132069)
	Drilled Shaft Foundation Inspection (FHWA-NHI-132070)
DFI	Micropile Design and Construction (FHWA-NHI-132078)
	Soils and Foundations Workshop (FHWA-NHI-132012)
	Geosynthetics Engineering Workshop (FHWA-NHI-132013)
	Subsurface Investigations (FHWA-NHI-132031)
	Ground Improvement Techniques (FHWA-NHI-132034)
	Geotechnical Aspects of Pavements (FHWA-NHI-132040)
	Micropile Design and Construction (FHWA-NHI-132078)
Subsurface Investigation Qualification (FHWA-NHI-132079)	

Overcoming Barriers with Distance Learning

NHI and TCCC partnership expands training options available to States

Where there's a will, there's a way. Since 2008, the National Highway Institute (NHI) and Transportation Curriculum Coordination Council (TCCC) have been partnering to offer a variety of Web-based courses through the NHI Web site reaching nearly 20,000 participants. Distance learning opportunities such as Web-based training enable transportation personnel across the country to access critical training without having to leave their desks, saving time and money typically associated with traveling offsite for professional development.

But what if technology limitations or agency Internet firewalls restrict access to the NHI Web site? Or, what if a department of transportation (DOT) wants to schedule and track its employees' on-demand training through its own learning management system (LMS)? These situations prompted some creative thinking and solutions.

The TCCC, a partnership between the Federal Highway Administration (FHWA), State DOTs, and the highway industry, aims to support programs for training and certification of the construction and maintenance workforce and to set national standards for employee

training. As such, says Christopher Newman, a system preservation engineer at FHWA and TCCC program manager, one of the partnership's goals is to "make it easy for managers to access the courses that produce highly qualified, highly motivated employees."

That's why NHI and the TCCC developed a State Training Sharing Program that provides stand-alone versions of the partnership's published catalog of Web-based training courses for States to use in their internal LMSs and post on their intranet sites. The courses are SCORM-compliant, meaning they can be shared across different types of LMSs. Distributing the training resources directly to the States ensures that potential participants within those States can access training and information that otherwise might not be available to them. In return, States agree to report quarterly participation numbers and use the most up-to-date versions of the courses.

The North Dakota Department of Transportation, for example, recently launched its LMS and wanted to offer on-demand training options that it could track in-house. "The TCCC courses, being listed in our catalog and uploaded into our LMS, facilitate electronic verification of coursework and do not create additional paperwork for those in charge of tracking training opportunities," says David Mott, training manager for engineering and technical training at the North Dakota DOT. "This training format will be very valuable because of the cost savings and flexibility the training allows."

Maxine Wheeler, bureau chief with the Alabama DOT's Training Bureau, reports similar results. The TCCC course Ethics Awareness for the Transportation Industry (FHWA-NHI-134069), for example, is required statewide for Alabama DOT employees. Already more than 4,600 people have taken the course in Alabama. "We didn't have the resources or information to provide the level of quality ethics training NHI has," Wheeler says. "What's great about the NHI course is that it's geared toward transportation personnel and uses good scenarios that staff can relate to."

The NHI/TCCC partnership currently offers more than 65 Web-based courses in four technical categories: construction and maintenance, pavement and materials, highway safety, and site and personal safety. The council plans to continue developing new courses and promoting the existing ones to grow participation levels and make sure the transportation workforce across the country has access to this training.

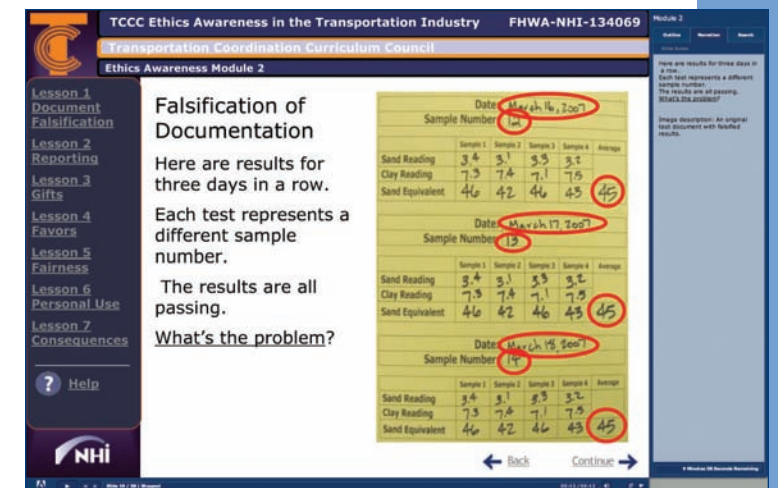
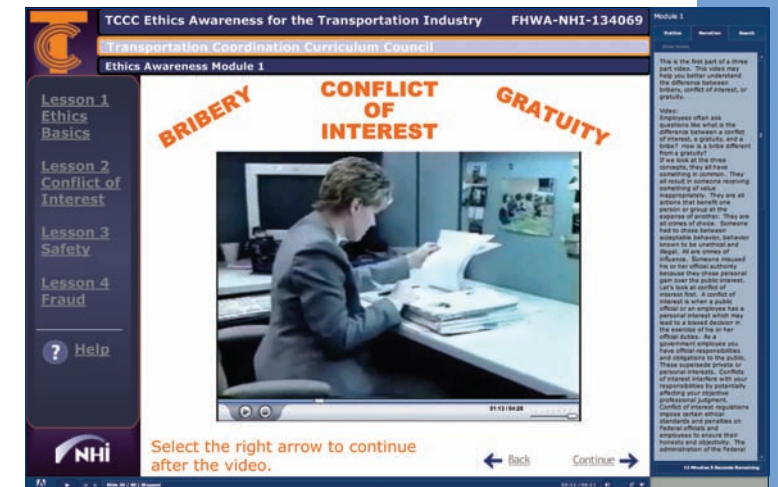
To fund that growth, in 2009 the TCCC launched a 5-year pooled fund study, "Support of the Transportation Curriculum Coordination Council (TCCC)" (TPF-5(209)), with the goal of securing \$1 million per year to further develop the core curriculum, create training materials, and refine tools for sharing training materials. Given current funding levels under FHWA appropriations, State support is critical, Newman says. "States are encouraged to contribute what they can to this program. In-kind contributions also are important, such as allowing State personnel to participate in TCCC technical panels on course development and sharing course materials that can be converted to Web-based training."

Broad support from the States will help NHI and the TCCC continue to deliver training to help the transportation workforce develop the skills and competencies needed to oversee construction and operation of the Nation's highway system.

FOR MORE INFORMATION, VISIT [HTTPS://FHWAAPPS.FHWA.DOT.GOV/TCCC/](https://FHWAAPPS.FHWA.DOT.GOV/TCCC/).

SAMPLING OF STATES AND THEIR LMS AND SCORM VERSIONS

Alabama	SCORM v. 1.2
Kansas	SCORM v. 1.2
Maryland	Adobe Connect
Minnesota	SCORM v. 1.2
North Dakota	SCORM v. 1.2
South Carolina	SCORM v. 1.2
Texas	SCORM v. 1.2
Utah	Adobe Connect



Shown here are screen captures from the course TCCC Ethics Awareness for the Transportation Industry (FHWA-NHI-134069), which more than 4,600 participants have taken in Alabama.

Going Green



Many NHI courses can help State DOTs reduce their environmental footprints

“Livability” is a fast-growing focus within the U.S. Department of Transportation and across the country. The notion of community livability is tied to the quality and location of transportation facilities in relation to good jobs, affordable housing, quality schools, safe streets, and a clean environment. The streets in cities and towns can contribute tremendously to the livability of communities, yet decades of car-centric planning often have failed to take into consideration the character of communities or the needs of an entire spectrum of users—including bicyclists, pedestrians, neighborhood residents, and local businesses. But policies and practices that once favored and focused almost exclusively on mobility are now shifting to processes that prioritize sustainability and livability, as more planners and decisionmakers come to view transportation as a means of building the kinds of communities in which people want to live, work, and play.

At the Federal Highway Administration (FHWA), one aspect of improving livability involves refining the relationship between highway infrastructure and the human and natural environment, in part by enhancing

the environmental sensitivity of roads and bridges. Toward that end, the National Highway Institute’s (NHI) training catalog offers a variety of courses that share state-of-the-practice knowledge and strategies to help transportation professionals make their projects and operations more sustainable.

NHI’s Transportation and Land Use course (FHWA-NHI-151043), for example, examines how downtown, suburban, and rural communities are integrating transportation and land use systems so they serve the needs of all users, not just automobiles. Through case studies and best practices, course participants examine how—in communities across the country—land use and transportation strategies are being used to foster placemaking to support downtown revitalization and transit-oriented development.

Roadway construction itself affects streams and ecosystems in a number of ways, in turn affecting people, wildlife, and the environment. In partnership with the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers, NHI developed the course Managing Road Impacts on Stream Ecosystems: An Interdisciplinary Approach (FHWA-NHI-142048). The training covers the ecological and physical characteristics of stream ecosystems, discusses the impacts that roadways can have on those ecosystems, and then turns to tools that practitioners can use to avoid or mitigate those effects.

“The course strives to provide a more holistic understanding of a stream’s physical and biological environment so roadway improvement projects are implemented with more sensitivity toward retaining the

Left: NHI’s Transportation and Land Use course describes the value of implementing “green” roadway elements, such as the landscaping, storm water curb extensions, and transit and pedestrian supportive environment shown in this artist’s rendering. These elements support safety, mobility, and visual quality, therefore promoting more walkable and livable communities.

Credit: McCormick Taylor, Inc.

natural character of the system,” says David Griffin, of McCormick Taylor, Inc., who is one of the instructors. “We try to stay away from solutions that force streams to do what we want and focus more on finding ways to allow streams to do what they want, but in a manner that protects the transportation infrastructure.”

Plus, NHI and its instructors regularly update course materials to reflect new information, technologies, practices, and regulations. For example, to help departments of transportation (DOTs) safely manage polluted runoff, or effluent, from roadway construction, NHI partnered with EPA to develop the course Design and Implementation of Erosion and Sediment Control (FHWA-NHI-142054). The training covers best practices in planning, design, implementation, enforcement, inspection, and maintenance strategies to control erosion related to road projects.

Until recently, visual inspection was the primary tool for evaluating effluent discharges. But in December 2009, EPA issued new quantitative guidelines that require stricter monitoring of water turbidity levels and implementation of various treatments such as infiltration trenches, berms, or settling basins to control discharges. As a result, NHI and EPA are busy updating the course to reflect the new standards.

“We are looking at methods to improve water quality and meet the new regulatory requirements,” says Patricia Czenas, a highway engineer with the FHWA Office of Project Development and Environmental Review who is involved in revamping the course. “The update will highlight the latest approaches to retaining sediment onsite and explain the steps DOTs need to take to be in compliance.”

A related course, Water Quality Management of Highway Runoff (FHWA-NHI-142047), looks at tools DOTs can use to reduce pollutant discharges from highways, maintenance facilities, and other land uses in order to comply with the requirements of the Clean Water Act.

“NHI training courses do more than build competency,” says Kevin Moody, an environmental specialist at FHWA. “The water courses not only show how to get a wetland permit, they explain that the permit addresses a social value as important as the roadway itself. The instructors help participants discover how the power of moving water can be turned from a threat to an opportunity, so countermeasures use the river’s energy as a positive force. Sort of like hydraulic jujitsu.”

In addition to these more obviously environment-focused courses, other NHI training related to paving and operations shines a light on best practices that not only save money but also contribute to greening

the transportation system. Asphalt Pavement In-Place Recycling Technologies (FHWA-NHI-131050), for example, imparts in-depth technical knowledge of methods to recycle old pavements into new ones. By reusing existing pavement materials, DOTs can simultaneously reduce the demand for mining and processing virgin aggregate materials and save landfill space that would have been used for old pavement materials.

Another course that offers ancillary environmental and livability benefits is Traffic Signal Design and Operation (FHWA-NHI-133028), which focuses on techniques to optimize traffic signal timing. Although the primary purpose of effective signal design and timing is to reduce congestion and delays, more fluid traffic flow also helps limit carbon dioxide emissions associated with vehicles idling at intersections. Better timed signals also improve safety and usability for motorists, pedestrians, and other road users, leading to a more pleasing transportation experience.

“Going green is about being smart, saving money, and reducing project delivery time, while fostering healthy human and natural environments,” FHWA’s Moody says. “It’s about making sure our infrastructure provides the American people with safe and reliable service. Participants walk away from NHI classes with the knowledge needed to deliver projects better, faster, and cheaper. And by ‘better,’ I mean that costs, safety, environmental opportunities, and all the other values that go into the decision, support a suite of tradeoffs that reflect the multiple values of our society.”

Given the variety of training opportunities available at NHI, learning the skills needed to improve the sustainability of roadway construction, management, and operations is just a mouse click or phone call away.

TO PARTICIPATE IN OR HOST A COURSE, VISIT WWW.NHI.FHWA.DOT.GOV.



The design of this new bridge to carry State Route 1058 over Skippack Creek in Montgomery County, PA, minimizes impacts on the stream and the infrastructure. Engineers used natural channel design techniques to provide a smooth entry and exit from the structure, deflect high-velocity flows from banks and piers, retain aquatic and riparian habitat, and provide passage for endemic species. These practices are among those covered in the NHI course Managing Road Impacts on Stream Ecosystems: An Interdisciplinary Approach (FHWA-NHI-142048).

Credit: Laren Myers, McCormick Taylor, Inc.



Shrinking the Knowledge Gap for Bridge Inspectors

Revamped courses incorporate emerging techniques, lessons learned

The Nation's highway system depends on its more than 600,000 bridges to make mobility and commerce possible—and sustain Americans' way of life. This immense, aging inventory of bridges needs to be carefully inspected and strategically preserved. Properly trained bridge inspectors, therefore, are critical to accurately assessing the condition of each structure and keeping bridges safe and functional.

Comprehensive training is a Federal requirement for all bridge inspection team leaders and program managers.

The number of bridges requiring inspection, coupled with a transitioning workforce, puts this training in high demand. The Federal Highway Administration (FHWA) and National Highway Institute (NHI) are meeting this need by offering a portfolio of courses and ensuring that the content reflects the latest research, lessons learned from bridge failures and inspection findings, and feedback from training participants.

"We recognize the importance of keeping bridge training courses fresh and sharing knowledge gained from past experiences with the bridge inspection community," says Thomas Everett, team leader of the Bridge Programs Team in FHWA's Office of Bridge Technology. "Inspectors are the frontline in identifying bridge safety concerns, and it is vitally important to make sure they have the latest information as they carry out their inspection duties."

Notably, NHI updated the Underwater Bridge Inspection (FHWA-NHI-130091) course in 2010 to include advancements in underwater inspection techniques, such as sonar imaging methods, which use sound to obtain underwater images. In addition, NHI developed a reference manual for the course and updated the materials to include photographs that help illustrate underwater bridge inspection. The updated 4-day course targets experienced divers, as well as bridge inspection program managers, structural engineers, and nondiver inspectors from the public and private sectors. The course, which meets the National Bridge Inspection Standards' requirements for underwater diving inspectors, uses practical exercises, such as identifying bridge parts in dark water, and demonstrations to reinforce the course content.

"[The Underwater Bridge Inspection course] is still the best course I've attended in my 35 years as a commercial diver," says Bill Woddail, dive unit supervisor with the Alabama Department of Transportation. "It bridges the gap between the diver/inspector and his counterpart engineer/inspector on the surface."

In addition, a new 2-day course, Underwater Bridge Repair, Rehabilitation, and Countermeasures (FHWA-NHI-130091A), details techniques for selecting and executing repairs to underwater bridge elements. The goals of the course are to enable design engineers to select, design, and specify appropriate and durable repairs to underwater bridge elements, and to train staff in



This inspector is conducting ultrasonic testing on a steel bridge component.
Credit: Phil Fish, Fish & Associates, Inc.

effective construction inspection of below-water repairs. Hosts can choose to offer the course in conjunction with Underwater Bridge Inspection or as a stand-alone class.

Other related courses recently updated include Bridge Inspection Refresher (FHWA-NHI-130053/130053A), Fracture Critical Bridge Inspection (FHWA-NHI-130078), and Engineering Concepts for Bridge Inspectors (FHWA-NHI-130054). Revisions to these courses include new photos, graphics, and exercises in participant materials; updated references to other manuals; and changes to topic-specific information that incorporate lessons learned and new techniques.

For example, the Fracture Critical Bridge Inspection course now includes a module on gusset plates, which are used to connect beams or truss members to load-bearing columns. The Bridge Inspection Refresher course now provides a menu of optional lessons—inspection of truss gusset plates, inspection of adjacent box beams, common National Bridge Inventory miscodings, element level ratings and timber superstructure—so the course can be tailored to meet States' individual needs. The updated Engineering Concepts for Bridge Inspectors course implements an audience response system (ARS), which enables participants to submit responses

electronically to interactive questions. Instructors will use the ARS to reinforce the course's learning outcomes by asking review questions and having the class vote on responses.

NHI also is updating Safety Inspection of In-Service Bridges (FHWA-NHI-130055). This course, one of NHI's most popular, will receive a complete overhaul of its exercises, case studies, photos, and graphics, and it will include two field trips for inspection exercises. The revamped course will highlight the advantages and disadvantages of nondestructive evaluation equipment and component- and element-level data rating. Also in the works are a Web-based prerequisite training to prepare inspectors for the safety inspection course, and a three-dimensional, virtual bridge inspection training for use when weather or other circumstances do not permit an onsite bridge field trip. In conjunction with the course updates, NHI will revise the *Bridge Inspector's Reference Manual* (FHWA NHI 03-001). NHI expects to pilot the updated 2-week safety inspection course in fall 2011.

FOR MORE INFORMATION ON THE UPDATED COURSES OR OTHER BRIDGE INSPECTION TRAINING, CONTACT LOUISA WARD AT (703) 235-0523 OR LOUISA.WARD@DOT.GOV.



A diver makes underwater bridge repairs with a hydraulically driven circular cut-off saw.



Left: Shown here are Kuwaiti participants in NHI's RSA course, which was the first full-length NHI training delivered in Kuwait.

International Training, Delivered

NHI is assisting Kuwait and South Korea in strengthening their infrastructure

For more than 20 years, the National Highway Institute (NHI) has collaborated with the Federal Highway Administration's (FHWA) Office of International Programs (OIP) to provide training resources to dozens of countries. For example, FHWA and NHI have longstanding relationships with both South Korea and Kuwait, and have hosted delegations from both countries to attend trainings at NHI. In fact, South Korea has sent five groups of engineers to NHI over the last 6 years to attend training on roadway development, highway safety, and technical assistance. FHWA has a staff member onsite in Kuwait who provides general guidance and advice regarding road work equipment and procedures.

Although NHI has collaborated with and assisted OIP in Kuwait in the past, it was not until 2010 when NHI had the opportunity to deliver a full-length training course there. In February 2008, a four-person FHWA team conducted an assessment of the training needs of the Kuwait Ministry of Public Works (MPW) and the strategy that FHWA is using to provide training assistance. The assessment was requested by the MPW Minister during his December 2007 visit with the FHWA Administrator. The report identified several training opportunities for Kuwait, including roadway design features, road safety audits, utilities, and Superpave.

Through the efforts of Aladdin Barkawi, FHWA senior advisor to the Kuwait MPW, NHI and OIP determined that the first international training session they would offer in Kuwait would be Road Safety Audits/Assessments (RSAs) (FHWA-NHI-380069). Two NHI instructors traveled there to deliver the 5-day RSA training to 35 attendees who represented the Ministry of Public Works, Ministry of the Interior, traffic police, contracting firms, and engineering consultant firms. On the last day of the course, the Ministry of Public Works' Assistant

Undersecretary for Roads handed out NHI certificates of completion to all the participants.

"The NHI RSA training course here in Kuwait was a success, and the Ministry of Public Works is keen to have this course repeated in the near future," Barkawi says. NHI officials hope that the RSA course is only the first of many training sessions to be scheduled in Kuwait. In fact, in July 2010, a Kuwaiti delegation visited NHI to learn more about training in the structures program area.

Although NHI has just started delivering courses in Kuwait, South Korean engineers have been traveling to NHI to attend training sessions since 2004. Within the last 6 years, a group of 15–20 Korean engineers have visited NHI five times to learn about the latest developments in pavement engineering and new technologies in the U.S. transportation industry. Over a 2-week period, the Korean engineers not only attend NHI courses but also have participated in field trips to materials labs and the Virginia Transportation Research Council in Charlottesville, VA. In the past, the engineers have been most interested in warm-mix asphalts, not only because they are cheaper, but because they produce fewer toxins and pollutants than hot-mix asphalt.

Before the engineers travel to the United States for the training, NHI sends relevant course materials and manuals to South Korea, where the materials are translated into Korean so the participants are better prepared when they arrive for the program. Although the training sessions are taught in English, only a few of the Korean engineers actually understand the language. Therefore, they employ a translator to sit in the trainings with them and translate the instructors' lectures.

"A few other countries have shown interest in developing a similar exchange program, but thus far South Korea is the only country that has been able to do this," says FHWA International Programs Engineer Roger Dean. The last group of engineers visited NHI in October 2010 and attended a 2-week session that included four NHI courses: Analysis of New and Rehabilitated Pavement with M-E Design Guide

Software (FHWA-NHI-131109); Asphalt Pavement In-place Recycling Technologies (FHWA-NHI-131050); Pavement Management Systems: Characteristics of an Effective Program (FHWA-NHI-131116A); and Hot-Mix Asphalt Pavement Evaluation and Rehabilitation (FHWA-NHI-131063). The delegates also went on a field trip to the Branscome Paving Company's materials lab in Manassas, VA.

NHI is always looking for opportunities to develop new international partnerships and share knowledge and courses with transportation counterparts beyond the U.S. border. These programs with South Korea and Kuwait are only the beginning.

FOR MORE INFORMATION ABOUT OIP'S ACTIVITIES, VISIT [HTTP://INTERNATIONAL.FHWA.DOT.GOV](http://INTERNATIONAL.FHWA.DOT.GOV).



From left: Jeff Bagdade, NHI instructor and vice president and senior transportation engineer with Opus International Consultants in Detroit, MI; Hussain Mansour, Kuwait Ministry of Public Works Assistant Undersecretary for Roads; Dr. Aladdin Barkawi of FHWA; and Richard Miller, retired Michigan State Police command officer, traffic safety expert, and NHI instructor.



ACEC Engineering Excellence Awards

NHI is presented with the Silver Award for the first comprehensive tunnel manual

Every year, the American Council of Engineering Companies (ACEC) recognizes its member firms for engineering projects of the highest level of skill and innovation through its Engineering Excellence Awards competition. Engineering firms enter their projects into the competition under one of twelve categories: studies, research, and consulting engineering services; building/technology systems; structural systems; surveying and mapping technology; environmental; waste and storm water; water resources; transportation; special projects; small projects; energy; and industrial, manufacturing processes, and facilities. The awards encourage ingenuity in the engineering field and recognize firms for the value and achievement of their projects.



Louisa Ward (left) and Dr. Firas I. Sheikh Ibrahim accept the Silver Award from ACEC New York.

On March 27, 2010, the Federal Highway Administration (FHWA) and the National Highway Institute (NHI) were awarded the Engineering Excellence Silver Award in the category of Studies, Research, and Consulting Engineering Services for creating the first national, comprehensive manual on the design and construction of tunnels. The *Technical Manual for Design and Construction of Road Tunnels—Civil Elements* was developed through NHI and under the technical direction of Dr. Firas I. Sheikh Ibrahim, currently Team Leader of Infrastructure Management in the FHWA Office of Infrastructure Research and Development and formerly a member of the FHWA Office of Bridge Technology. The primary goal of the manual is to address the structural and geotechnical elements of road tunnels. The manual provides guidelines for designing, constructing, and rehabilitating these tunnels.

To commemorate his work, Dr. Ibrahim attended the black tie awards ceremony and accepted the Silver Award along with Louisa Ward (NHI training program manager for geotechnical, structures, and hydraulics programs) from ACEC's New York chapter.

"We appreciate ACEC's recognition of this landmark effort," Dr. Ibrahim said. "The manual exemplifies FHWA and NHI's proactive commitment to ensure that our infrastructure is safe, reliable, and healthy. It is the first U.S. comprehensive manual to standardize state-of-the-art practices for the design and construction of tunnels. The success of this effort was the result of an experienced tunnel development team, the seamless cooperation of several FHWA offices and NHI, and the active engagement of our State partners."

Up next, in cooperation with tunnel owners, FHWA is in the process of developing a manual on the maintenance, operation, and inspection of road tunnels. The *Technical Manual for Design and Construction of Road Tunnels—Civil Elements* is available for download at www.fhwa.dot.gov/bridge/tunnel/pubs/nhi09010/index.cfm and printed versions can be purchased from the NHI Store by visiting www.nhi.fhwa.dot.gov/training/nhistore.aspx.



The Cumberland Gap Tunnel is a highway tunnel that carries U.S. Route 25 East under Cumberland Gap National Historical Park between Tennessee and Kentucky. Shown here is the east portal from the Tennessee side.

Credit: Parsons Brinckerhoff, Inc.

New and Updated Courses Launched in 2010

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 in 2010.

INSTRUCTOR-LED TRAINING	
An Overview of the Railroad-Highway Grade Crossing Improvement Program	FHWA-NHI-380097
Asphalt Mixture Performance Tester (AMPT)	FHWA-NHI-131118
Bridge Inspection Non-Destructive Evaluation Showcase (BINS)	FHWA-NHI-130099
Bridge Inspection Refresher Training (3.5 Day)	FHWA-NHI-130053A
Fracture Critical Inspection Techniques for Steel Bridges	FHWA-NHI-130078
Highway Safety Manual Practitioners Guide for Intersections	FHWA-NHI-380105
Modern Roundabouts: Designing Intersections for Safety	FHWA-NHI-380096
Science of Crash Reduction Factors	FHWA-NHI-380094
Transportation Asset Management	FHWA-NHI-131106
Underwater Bridge Inspection	FHWA-NHI-130091
Underwater Bridge Repair, Rehabilitation, and Countermeasures	FHWA-NHI-130091A
Value Engineering (3 Day)	FHWA-NHI-134005

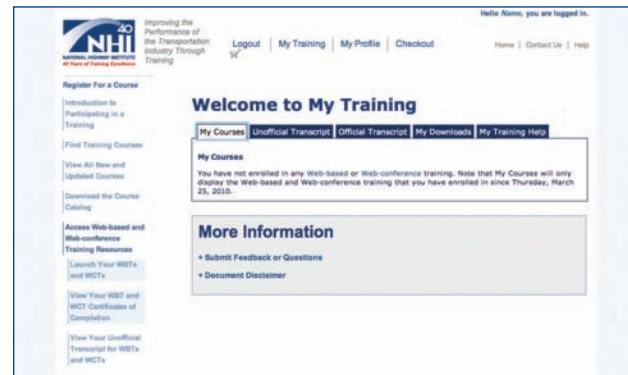
WEB-BASED TRAINING	
Introduction to Value Engineering	FHWA-NHI-134005A
TCCC Advanced Self-Consolidating Concrete	FHWA-NHI-131130
TCCC Basic Construction Surveying	FHWA-NHI-134106
TCCC Bolted Connections	FHWA-NHI-134074
TCCC CDL Series: Air Brakes	FHWA-NHI-381005
TCCC CDL Series: General Knowledge	FHWA-NHI-381004
TCCC CDL Series: Pre-Trip Inspection	FHWA-NHI-381006
TCCC Concrete Pavement Preservation Series	FHWA-NHI-131126 (A-J)
TCCC HMA Paving Field Inspection	FHWA-NHI-131129
TCCC Maintenance of Traffic for Supervisors	FHWA-NHI-380099
TCCC Maintenance of Traffic for Technicians	FHWA-NHI-380098
TCCC Pavement Preservation Treatment Construction	FHWA-NHI-131110
TCCC Pavement Preservation Treatment Series	FHWA-NHI-131110 A-K
TCCC Plan Reading Series	FHWA-NHI-134108 (A-H)
TCCC Recognizing Roadside Weeds (Southeastern States)	FHWA-NHI-134107
TCCC Safe Use of Basic Carpentry Tools	FHWA-NHI-381003
TCCC Safe Use of Hand and Power Operated Tools	FHWA-NHI-381002
TCCC Safety Orientation	FHWA-NHI-381001
TCCC Testing Self-Consolidating Concrete	FHWA-NHI-131128

WEB-CONFERENCE TRAINING	
Optimal Timing of Pavement Preservation	FHWA-NHI-131114

Accessing NHI Training

My Training

“My Training” is a single sign-on feature that simplifies the process of accessing Web-based and Web-conference training by enabling NHI customers to directly launch them on the NHI Web site. Through “My Training,” customers also can view their course history, obtain personalized certificates and unofficial transcripts for completed trainings, request an official transcript, and download electronic materials ordered from the NHI Store.



Hosting a Course

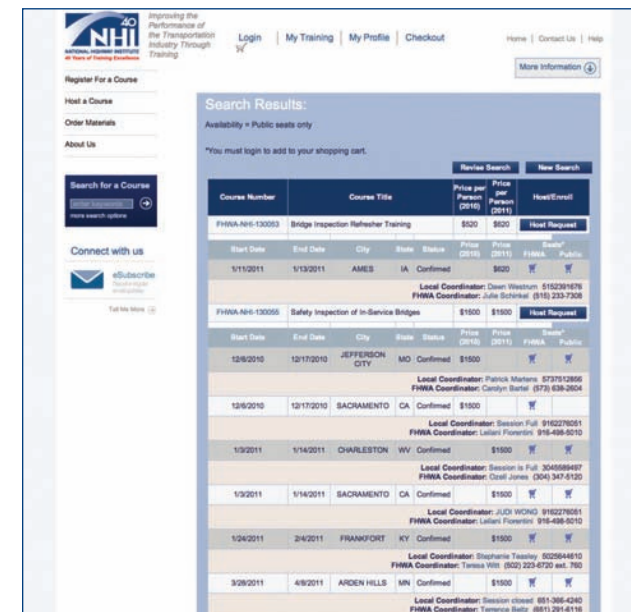
NHI partners with the transportation industry to develop and deliver training. Hosting organizations provide the facilities and equipment, while NHI provides topnotch instructors and course materials. Because of this unique training delivery model, the “host” and Local Coordinator (a representative of the host organization) play a significant role in coordinating NHI training.

Any organization can host an NHI session, including Federal Highway Administration division offices, State departments of transportation (DOTs), consultants, metropolitan planning organizations (MPOs), professional associations, and universities. For U.S. customers interested in hosting an NHI session, submit the Host Request form available on the NHI Web site (www.nhi.fhwa.dot.gov/training/HostCourse.aspx). International customers should contact Roger Dean at (703) 235-0550 or by email at roger.dean@dot.gov for more information about hosting an NHI training.

After the Host Request form is received, an Instructor or a member of the NHI team will contact the Local Coordinator to schedule session dates and issue a formal hosting confirmation. The Local Coordinator’s contact information will be listed with the scheduled session on the NHI Web site. Participants can contact the Local Coordinator directly to enroll.

Public Seats

Once a session is scheduled, hosts can choose to sell available seats to the public through the NHI Web site. NHI refers to these open seats as “public seats.” When hosts elect this option, the display for a scheduled session will have a shopping cart appear with the listing. An individual can enroll by adding the session to his or her shopping cart and proceeding to checkout.



FOR MORE INFORMATION ABOUT “MY TRAINING,” HOSTING AN NHI TRAINING, OR PURCHASING PUBLIC SEATS, VISIT THE NHI WEB SITE AT WWW.NHI.FHWA.DOT.GOV.

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Financial Management
Freight and Transportation Logistics
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Pavement and Materials
Real Estate
Structures
Transportation Planning

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