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These NHI category icons can assist users in identifying the course category or multiple course categories. The category icons are listed below for your reference.

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WHO WE ARE
The National Highway Institute (NHI) provides technical training to the highway transportation workforce to build skills and enhance job performance to improve the conditions and safety of our nations’ roads, highways, and bridges.

As part of Federal Highway Administration’s (FHWA) Office of Technical Services (OTS), NHI courses complement the targeted training and technical assistance of FHWA program offices, Resource Center, and Local and Tribal Technical Assistance Programs (LTAP/TTAP).

OUR TRAINING
NHI courses are instrumental in developing core competencies and new skills, as well as learning about leading technologies and current policies. Our instructors strive to ensure that participants leave training not only with additional knowledge, but also the ability to apply that knowledge directly to their work. NHI is an accredited training provider by the International Association of Continuing Education and Training (IACET), allowing participants to earn Continuing Education Units (CEUs) for completed coursework. NHI also is an approved provider of the American Institute of Certified Planners (AICP) certification maintenance (CM) credits.

NHI offers three types of training.
Instructor-led Training (ILT): These courses are held in-person and led by an instructor when an organization is available to host the session. Any organization may host a session by submitting a Host Request form on the NHI Web site.
Web-conference Training (WCT): These are live, online training sessions that take place at a set time. Web-conference Training sessions also require a host.
Web-based Training (WBT): These online courses are available 24/7 for six months after purchase by the registrant. Participants can control the pace at which they complete the course and may return to it as many times as they wish within the six-month access period.

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Customers with additional questions may also contact NHI Customer Service at NHICustomerService@dot.gov, or by phone during regular business hours, 7:30AM – 4:30PM Eastern Time, at (877) 558-6873.
NHI MAKES HOSTING EASY

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NHI partners with host organizations across the country to deliver training where it is needed most. NHI provides top-notch instructors and course materials, while hosting organizations provide the facilities and equipment.

WHO CAN HOST
Any United States-based organization can host Instructor-led Trainings (ILT), which are taught in classrooms, and/or Web-conference Trainings (WCT), which are taught online.

Our instructors may tailor individual sessions to meet the unique needs and array of experiences of the hosting organization, including covering local issues and topics of special interest. Instructors also may modify case studies and exercises based on their subject matter expertise to make them pertinent to the participant’s experiences.

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To host a course, domestic customers can go to the NHI Web site and complete the appropriate Host Request form (ILT or WCT). The process takes just a few minutes. First-time users will need to create a user profile and check the INSTRUCTOR/HOST BOX.

If you run into any difficulty when you are logging in, filling out a Host Request form, or navigating the NHI Web site, please contact NHI Customer Service for help at (877) 558-6873 during normal business hours, 7:30am – 4:30pm Eastern time. Customers may also email NHI Customer Service at nhicustomerservice@dot.gov.

To assist the host in preparation for and coordination of the session, a hosting checklist is provided on the NHI Web site. This checklist includes important information about hosting your NHI training session, as well as valuable “best-practice” information based on NHI’s 40 years of experience with our hosting partners.

CONFIRMING SESSION DATES/LOCATIONS/TIMES
After the Host Request form is received, an Instructor or a member of the NHI team will contact the host to discuss scheduling options. While preferred dates may be specified on the Host Request form, sessions are not official until the hosting organization receives formal confirmation from NHI. Once official, NHI will list the session publicly on its Web site.

Enrollment Options
The host’s contact information is listed with the scheduled session. Interested participants from outside the host’s organization may contact the host to enroll. Alternatively, the host may ask NHI to open public seats, which allow outside participants to enroll through NHI.

The NHI Scheduler will email all participant information to the host and instructor prior to the session start date.

HOSTING EXPENSES
To host a session, hosts are charged the per-participant price multiplied by the class-size minimum, or the host is charged per participant if the session class size exceeds the minimum. Pricing cannot be reduced if the minimum class size is not met. Therefore, if registration for a course is lower than anticipated, it is important for the host to contact NHI prior to the cancellation period (15 business days) to discuss a remedy. Please note that with sufficient notice, NHI may be able to offer marketing support for the session.

Three seats in every session are reserved for Federal Highway Administration (FHWA) employees until 15 days before the course begins. FHWA participants do not count toward the participant minimum, but should be considered in the course maximum. Hosts are not charged for FHWA personnel or participants who have paid via the NHI Web site. Hosts are not charged for any instructor expenses.

Course hosts may charge participants an additional fee to recover all or part of costs associated with hosting the course. However, we ask hosts to contact the NHI Scheduler at (703) 235-0534 with this information prior to the confirmation of the session.

Course fees, which include the cost of materials for each participant, are listed with every course description.
RECEIVING COURSE MATERIALS
NHI will ship course material to the host approximately three weeks prior to the session start date.

PROVIDING PAYMENT
Payment may be made to NHI by check, money order, or credit card. Checks and money orders must be made payable to the National Highway Institute. To make credit card payments, contact NHI Customer Service at NHICustomerService@dot.gov or 1-877-558-6873. You are not charged for any FHWA participants or for participants who paid via the NHI Web site.

CANCELLATION POLICY/REFUNDS
To avoid incurring the $1,500 cancellation fee, cancellation must be requested no later than 15 business days prior to the course start date. If a course must be cancelled, the host is required to contact NHI Customer Service at 1-877-558-6873 during normal business hours, 7:30AM – 4:30PM Eastern Time, or email NHICustomerService@dot.gov. If the course materials have been sent, the host must contact NHI Customer Service.

In the event of cancellation, it is the host's responsibility to contact all participants (including those registered for public seats). There must be verification that the registrants received the cancellation notice. Notice to out-of-state participants is especially important so that they may alter or cancel any travel arrangements.

In the case of an emergency or weather-related closing, the cancellation fee will not apply. NHI follows the host office's policy regarding weather and emergency closings.
RECEIVING COURSE CREDIT

Many of the courses offered at NHI can be used toward obtaining Continuing Education Units (CEUs), Certification Maintenance (CM) credits, and Professional Development Hours (PDHs). Please select the headers below for more information about receiving credits.

CONTINUING EDUCATION UNITS

NHI has been recognized as an Accredited Provider by the International Association for Continuing Education and Training (IACET). In obtaining this accreditation, NHI has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of this Accredited Provider status, NHI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard. IACET is an independent, non-profit association whose goal is to ensure quality continuing education for professionals. For an organization to become an IACET approved CEU Accredited Provider, it must demonstrate that it designs, develops, and delivers training in accordance with proven adult learning theory and recognizes instructional systems design practices. Each course description in the NHI catalog includes the number of CEUs offered upon successful completion of the course.

One CEU is offered for every ten contact hours of training led by a qualified instructor and qualified instruction. In order to be offered CEUs, a course participant must attend 100% of the course and must pass the course examination with a score of 70% or greater.

CEUs are offered to each course participant who fulfills the above stated requirement. NHI will maintain individual training records for seven years for the CEUs offered. Individuals and their employers are also encouraged to maintain their own training records including course name, class date(s), instructor name, class roster, and CEUs offered.

For proof of your CEU record, please contact NHI at NHICustomerService@dot.gov or 1-877-558-6873 and request your official transcript. Your official transcript displays a record of your NHI course history as well as the CEUs offered for each CEU-accredited course. Please allow at least one month after the completion of your course before requesting your official transcript.

CERTIFICATION MAINTENANCE CREDITS

NHI offers Certification Maintenance (CM) credits to assist professional planners become and maintain their membership as certified planners through the American Planning Association (APA).

American Institute of Certified Planners (AICP) is APA’s professional institute. Certified Planners have demonstrated a commitment to high standards of professional practice and a mastery of theories and tools of planning.

NHI recognizes that the certification carries a high mark of distinction and requires planners to meet rigorous standards and maintain their expertise through continuing education. Planners must earn 32 CM continuing education credits every two years in order to stay up to date on the latest trends, technologies, and best practices. NHI courses will now help them achieve that requirement.

CM credits are measured in contact hours, so that 30 minutes of instructional time equals 30 minutes of CM credit (30 minutes contact = 0.5 CM credits; 1.0 contact hours = 1.0 CM credits). An event must be at least 30 minutes in duration to be eligible for CM credit.

Contact NHI Customer Service at NHICustomerService@dot.gov or 877-558-6873 to ask for an official transcript to be used by AICP to calculate CM credits. Please allow at least one month after the completion of your course before requesting your official transcript.

PROFESSIONAL DEVELOPMENT HOURS (PDHs)

NHI does not officially offer PDHs; however, it is possible to receive PDHs for your completed NHI training courses. To receive PDHs, please submit your course certificate (which indicates the contact hours assigned to the course) and/or your official transcript (which indicates the CEUs granted for a course) to the respective licensing agency. Upon consent, the licensing agency may convert your hours and/or CEUs into PDHs and proceed with the PDH awarding process.

PDHs are offered on a ratio of one contact hour to one PDH. When converting from CEU to PDH, please note that one CEU is equal to ten PDHs (or one PDH is equal to one-tenth of a CEU).

To request your official transcript with proof of CEU record and/or contact hours, please contact NHI at NHICustomerService@dot.gov or 1-877-558-6873. Your official transcript displays a record of your NHI course history as well as
the CEUs offered for each CEU-accredited course. Please allow at least one month after the completion of your course before requesting your official transcript.

**NHI Certificates of Accomplishment**

NHI’s Certificates of Accomplishment program was designed to recognize individuals who have successfully enhanced their depth and breadth of knowledge and expertise in specific disciplines or topic areas. Students would be eligible for the Certificate of Accomplishment when they have completed and passed a suite of related NHI course offerings. Currently, this program has been put on hold, although it is expected to be re-initiated in the near future.

More Information will be released as soon as it is available.
FREE WEB-CONFERENCE TRAINING

NHI is excited to offer FREE Web-conference training. These trainings save both time and money, while covering the latest topics and techniques within the transportation industry. All transportation professionals in the public and private sectors are invited to participate in these trainings.

REAL SOLUTIONS SEMINAR SERIES
This series of free monthly Webinars features a guest speaker who presents problems or issues faced in the field and what steps were taken to solve them. In some sessions, additional panelists join the guest speaker to further discuss that seminar’s topic.

Some past topics include:
• Best Practices for Integrating Climate Change Considerations in the Transportation Planning Process
• eLearning and Distance Learning within the Transportation Industry
• Smart Corridors and Complete Streets: A Look at Some Situations and Strategies
• Solving Old Traffic Noise Ills: Tennessee Type II Noise Abatement Program

Visit the Real Solutions Seminar Series section of the Web site to register for the next Real Solutions Web conference or to listen to past Web conferences.

LEARN MORE
For more information, please visit the NHI Web site at www.nhi.fhwa.dot.gov.
Want to be notified when a free Web conference is scheduled? Email nhimarketing@dot.gov.
COURSE NUMBER
FHWA-NHI-130053

COURSE TITLE
Bridge Inspection Refresher Training

The major goals of this course are to refresh the skills of practicing bridge inspectors in fundamental visual inspection techniques; review the background knowledge necessary to understand how bridges function; communicate issues of national significance relative to the nation’s bridge infrastructures; re-establish proper condition and appraisal rating practices; and review the professional obligations of bridge inspectors.

This course is based on the “Bridge Inspector’s Reference Manual,” 2002 (updated in 2006) with reference to the AASHTO Manual as defined by the National Bridge Inspection Standards regulation.

Core course topics include inspector qualifications and duties, bridge mechanics, record keeping and documentation, fatigue and fracture in steel bridges, traffic safety features, safety, National Bridge Inventory (NBI) component ratings, superstructure type identification, inspection techniques and case studies for decks, superstructures, bearings, substructures, channels and culverts, and a mock bridge inspection classroom exercise.

Optional topics include fiber reinforced polymer, inspection of truss gusset plates, inspection of adjacent box beams, bridge site signing, structure inventory and appraisal overview, common NBI miscodings, element level ratings and timber superstructures.

For this version of the course (3-day), the host agency will need to select three (3) desired optional topics. Course instructors will contact the host prior to the course to complete a pre-course questionnaire, determine optional topics to be taught, and discuss the course schedule.

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe the current overall condition and condition trends for the nation’s bridges
• Identify the recent National Bridge Inspection Standards (NBIS) revisions
• Accurately code National Bridge Inventory (NBI) items
• Identify and document inspection observations using standard methods
• Evaluate defects based on the 2008 AASHTO Manual for Bridge Evaluation
• Code NBI components using the Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation’s Bridges
• Determine if overall structure/structural member is fracture critical prone
• Accurately inspect and evaluate a bridge’s four traffic safety features
• List the keys to ensuring a safe work environment
• Explain bridge responses and bridge mechanic principles

TARGET AUDIENCE
The target audience for this course includes Federal, State, and local agencies and private sector personnel employed in inspecting bridges or managing bridge inspection programs. The course is built to accommodate those that have completed comprehensive bridge inspection training (130055 or similar) or met the criteria for a bridge inspector under the State’s procedures or requirements.
TRAINING LEVEL: Intermediate

FEE: 2022: $900 Per Person; 2023: $900 Per Person

LENGTH: 3 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-130055

Course Title
Safety Inspection of In-Service Bridges

NOTE: This course was updated in 2012 and 2015 and now contains mandatory prerequisite requirements for participants and host requirements in preparation for the field exercises. See details below.

This course is based on the 2015 FHWA “Bridge Inspector’s Reference Manual (BIRM)” and provides training on the safety inspection of in-service highway bridges. The course includes two virtual bridge inspection exercises* facilitated using NHI’s virtual bridge inspection (VBI) computer-based training (CBT) technology; instruction on critical findings, their identification and response; curriculum on the American Association of State Highway and Transportation Officials (AASHTO) element level inspection approach using the 2013 AASHTO Manual for Bridge Element Inspection 2015 Interim Revisions; and activities that maximize participant engagement throughout the course. This course does not go into depth on fracture critical, underwater, or complex bridge inspections. Other specialty courses, 130078 Fracture Critical Inspection Techniques for Steel Bridges and 130091 Underwater Bridge Inspection, cover these topics.

Participants will be asked to complete mid-term and end-of-course assessments with a cumulative score of 70% or better to successfully complete the course and receive a certificate of completion. The sponsoring agency/State may monitor the examinations and retain the scores to qualify or certify bridge inspectors. Satisfactory completion of this course will fulfill the comprehensive bridge inspection training requirements of the National Bridge Inspection Standards. Note: Many States have additional requirements to become a bridge inspection team leader.

Participant Prerequisite Requirement: ALL participants must have met one of the three prerequisite requirements for participation in this course** and bring a course completion certificate bearing their name to the first day of the class. The passing score for all prerequisites is 70% or better. Individuals have the option to complete one of the following three prerequisite requirements: 1) 130054 Engineering Concepts for Bridge Inspectors, a 5-day Instructor-led course; 2) 130101 Introduction to Safety Inspection of In-Service Bridges, a 14-hour Web-based training and assessment; -OR- 130101A Prerequisite Assessment for Safety Inspection of In-Service Bridges, a Web-based assessment only (test out).

Host Requirements: The host must identify in-service bridges and bridge documentation in order to conduct course field inspections, which shall be the primary means for field reviews. The host and or sponsoring agency is required to provide transportation for course participants to attend the field trip portion of the course at the host/sponsoring agency’s own expense. The host must coordinate with the instructors to identify bridges for inspection during the field trip exercises, two weeks minimum in advance of the course delivery. For this course the host must identify one concrete bridge and one steel bridge.

*Alternatively, the State can utilize the Virtual Bridge Inspection Computer Based Training (VBI CBT) for facilitating bridge inspection exercises when weather and safety conditions are unfavorable for a participating audience. In those conditions and only in those conditions shall hosts and or sponsoring agencies utilize the virtual laptops to accommodate a maximum of 30 participants. The 15 (pair of two participants) NHI virtual bridge laptops will be provided by NHI Instructors and will be used for the virtual bridge exercises.

Additionally, the host must ensure that ALL students have successfully met the prerequisite requirement* and have a valid course completion certificate for one of the three prerequisite options.

Host must have room with internet access.

OUTCOMES
Upon completion of the course, participants will be able to:

• Discuss the duties and responsibilities of a bridge inspector and define inspection concepts including personal and public safety issues associated with bridge inspections
• List the inspection equipment needs for various types of bridges and site conditions
• Describe, identify, evaluate, and document the various components and deficiencies that can exist on bridge components and elements
• List design characteristics and describe inspection methods and locations for common concrete, steel, and timber structures
• Identify and evaluate the various culvert and waterway deficiencies
• Discuss the need to inspect underwater portions of bridges
• Describe nondestructive evaluation methods for basic bridge materials
• Demonstrate how to field inspect and evaluate common concrete, steel, and timber bridges

TARGET AUDIENCE

Federal, State, and local highway agency employees; and consultants involved in inspecting bridges or in bridge inspection management and leadership positions. A background in bridge engineering is strongly recommended. All participants must successfully complete (score 70% or better) one of the following three prerequisite requirements within two years prior to attending this training: 1) 130054 Engineering Concepts for Bridge Inspectors; 2) 130101 Introduction to Safety Inspection of In-Service Bridges; or 3) 130101a Prerequisite Assessment for Safety Inspection of In-Service Bridges.

TRAINING LEVEL: Intermediate

FEE: 2022: $2100 Per Person; 2023: $2300 Per Person

LENGTH: 10 DAYS (CEU: 6.7 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
**COURSE NUMBER**  
FHWA-NHI-130056  

**COURSE TITLE**  
Safety Inspection of In-Service Bridges for Professional Engineers  

In accordance with the National Bridge Inspection Standards (NBIS), a Bridge Inspector must successfully complete an FHWA-approved comprehensive training to become a certified Bridge Inspection Team Leader, or Program Manager. This FHWA-approved course, intended for Professional Engineers (PEs), is based on the “Bridge Inspector’s Reference Manual” (BIRM) and provides training on the safety inspection of in-service highway bridges. It has been streamlined to better suit experienced Professional Engineers, while retaining strong emphasis on bridge inspection, documentation, and coding requirements. The course is a 5-day adaptation of FHWA-NHI 130055 training course and includes one virtual bridge inspection trip (VBI) or bridge inspection field trip; new instruction on critical findings, their identification and response; curriculum on the new AASHTO Element level evaluation; and updated activities that maximize participant engagement throughout the course. This course does not go into depth on stream stability and scour or fracture critical, underwater, or complex bridge inspections. NHI does have other specialty courses in stream stability and scour (FHWA-NHI-135047) fracture critical inspection (FHWA-NHI-130078) and underwater safety inspection (FHWA-NHI-130091).

**Participant Prerequisite Requirement:** ALL participants must be certified professional engineers (PE) showing evidence of such certification upon arrival at the course, have met one of the three prerequisite requirements for participation in the FHWA-NHI-130056 course* and bring a course completion certificate bearing their name to the first day of the NHI-FHWA-130056 session. The passing score for all prerequisites is 70% or better. Individuals have the option to complete one of the three prerequisite requirements: 1) Engineering Concepts for Bridge Inspectors (FHWA-NHI-130054), five-day instructor-led course; 2) Introduction to Safety Inspection of In-Service Bridges (FHWA-NHI-130101), 14-hour, Web-based training and assessment; and/or 3) Prerequisite Assessment for Safety Inspection of In-Service Bridges (FHWA-NHI 130101a), Web-based assessment.

**Host Requirement:** The host must identify in-service bridges and bridge documentation in order to conduct course field inspections, which shall be the primary means for field reviews. The host/sponsoring agency is required to provide transportation for course participants to attend the field trip portion of the course at the host/sponsoring agency’s own expense. The host must coordinate with the instructors to identify bridges for inspection during the field trip exercises, a two (2) week minimum in advance of the course delivery. For this course, the host must identify one (1) concrete bridge or one (1) steel bridge for inspection as a part of the field trip exercise.

Alternatively, the State can utilize the Virtual Bridge Inspection Computer Based Training (VBI CBT) for facilitating bridge inspection exercises when weather and safety conditions are unfavorable for a participating audience. In those conditions and only in those conditions shall hosts/sponsoring agencies utilize the virtual laptops to accommodate a maximum of 30 participants. The 15 (pair of two participants) NHI virtual bridge laptops will be provided by NHI Instructors and will be used for the virtual bridge exercises.

Additionally, the host must ensure that ALL students have successfully met the prerequisite requirement and have a valid course completion certificate for one of the three prerequisite options.

Please note; prerequisite must be completed within the last 2 years prior to the FHWA-NHI-130056 session start date.

**OUTCOMES**  
Upon completion of the course, participants will be able to:

- Describe the importance of bridge inspection  
- Define the fundamental bridge inspection concepts  
- Describe the basic bridge materials  
- Identify and discuss mitigation strategies for personal and public safety issues associated with bridge inspections  
- List the inspection equipment needs for various types of bridges and site conditions  
- Describe the various components of bridge inspection reporting  
- Identify, evaluate, and document the various deficiencies that can exist on bridge decks  
- List design characteristics of common concrete superstructures  
- Describe inspection methods and locations for common concrete superstructures  
- Identify and evaluate the various bridge bearing, substructure, and waterway deficiencies
• Discuss the need to inspect underwater portions of bridges
• Describe nondestructive evaluation methods for the three basic bridge materials
• Demonstrate how to field inspect and evaluate a common concrete bridge
• List design characteristics of common steel superstructures
• Describe inspection methods and locations for common steel superstructures
• Identify and evaluate the various culvert deficiencies
• Demonstrate how to field inspect and evaluate a common steel bridge
• List design characteristics of common timber superstructures

TARGET AUDIENCE
The target audience for this course are Federal, State, and local highway agency employees; and consultants with a Professional Engineer (PE) designation that are involved in inspecting bridges or in bridge inspection management and leadership positions. A background in bridge engineering is strongly recommended. All participants must successfully complete (score 70% or better) one of the following three prerequisite requirements within two years prior to attending this training: 1) 130054 Engineering Concepts for Bridge Inspectors; 2) 130101 Introduction to Safety Inspection of In-Service Bridges; or 3) 130101a Prerequisite Assessment for Safety Inspection of In-Service Bridges.

TRAINING LEVEL: Intermediate

FEE: 2022: $1100 Per Person; 2023: $1250 Per Person
LENGTH: 5 DAYS (CEU: 3.4 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130078

COURSE TITLE
Fracture Critical Inspection Techniques for Steel Bridges

The course curriculum for this training reflects current practices, while addressing new and emerging technologies available to bridge inspectors. In addition, the course features exemplary training: hands-on workshops for popular types of nondestructive evaluation (NDE) equipment; and a case study of an inspection plan for a fracture critical bridge.

The first day of the training focuses on the concept of fracture critical members (FCMs), FCM identification, failure mechanics, fatigue in metal, and an overview of NDE methods. Day two includes demonstration sessions and hands-on applications of NDE techniques for dye penetrant, magnetic particle testing, Eddy current testing, and ultrasonic testing. Days three and four emphasize inspection procedures and reporting for common FCMs, including problematic details, I-girders, floor beams, trusses, box girders, pin and hanger assemblies, arch ties, eyebars, and cross girders/pier caps. The course will conclude with a case study detailing the preparation of an inspection plan of a fracture critical bridge. Additionally, the course instructors will tailor discussions of topics based on State needs and requirements.

"This training will help inspectors evaluate bridges more thoroughly and will provide them with additional knowledge in how structures work and what can take place when they don't work," states Bill Drosehn, district bridge inspection engineer for the Massachusetts DOT.

Note: Hosts are required to provide safety goggles for all course participants as well as a well-ventilated space for conducting the dye penetrant demonstration.

OUTCOMES
Upon completion of the course, participants will be able to:

• Identify fracture critical members (FCMs)
• Identify problematic details
• Identify areas most susceptible to fatigue and fracture
• Record defects
• Evaluate defects
• Evaluate nondestructive evaluation (NDE) methods
• Evaluate retrofit details

TARGET AUDIENCE
Those who will benefit most from this training are public and private sector bridge inspectors, supervisors, project engineers, and others responsible for field inspection of fracture critical steel bridge members. Prior to taking this course, participants should have completed NHI course 130055, Safety Inspection of In-Service Bridges, or possess equivalent field experience relative to bridges. Participants also should have a thorough understanding of bridge mechanics and bridge safety inspection procedures as required by the National Bridge Inspection Standards.

TRAINING LEVEL: Intermediate

FEE: 2022: $900 Per Person; 2023: $900 Per Person
LENGTH: 3.5 DAYS (CEU: 2.5 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
 COURSE NUMBER
FHWA-NHI-130078S

 COURSE TITLE
Bridge Inspection Techniques for Nonredundant Steel Tension Members (NSTM) (PILOT)

The course curriculum for this training reflects current practices, while addressing new and emerging technologies available to bridge inspectors. In addition, the course features exemplary training: hands-on workshops for popular types of nondestructive evaluation (NDE) equipment; and a case study of an inspection plan for a fracture critical bridge.

The first day of the training focuses on the concept of fracture critical members (FCMs), FCM identification, failure mechanics, fatigue in metal, and an overview of NDE methods. Day two includes demonstration sessions and hands-on applications of NDE techniques for dye penetrant, magnetic particle testing, Eddy current testing, and ultrasonic testing. Days three and four emphasize inspection procedures and reporting for common FCMs, including problematic details, I-girders, floor beams, trusses, box girders, pin and hanger assemblies, arch ties, eyebars, and cross girders/pier caps. The course will conclude with a case study detailing the preparation of an inspection plan of a fracture critical bridge. Additionally, the course instructors will tailor discussions of topics based on State needs and requirements.

“This training will help inspectors evaluate bridges more thoroughly and will provide them with additional knowledge in how structures work and what can take place when they don’t work,” states Bill Drosehn, district bridge inspection engineer for the Massachusetts DOT.

Note: Hosts are required to provide safety goggles for all course participants as well as a well-ventilated space for conducting the dye penetrant demonstration.

OUTCOMES
Upon completion of the course, participants will be able to:
• Identify fracture critical members (FCMs)
• Identify problematic details
• Identify areas most susceptible to fatigue and fracture
• Record defects
• Evaluate defects
• Evaluate nondestructive evaluation (NDE) methods
• Evaluate retrofit details

TARGET AUDIENCE
Those who will benefit most from this training are public and private sector bridge inspectors, supervisors, project engineers, and others responsible for field inspection of fracture critical steel bridge members. Prior to taking this course, participants should have completed NHI course 130055, Safety Inspection of In-Service Bridges, or possess equivalent field experience relative to bridges. Participants also should have a thorough understanding of bridge mechanics and bridge safety inspection procedures as required by the National Bridge Inspection Standards.

TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: N/A

LENGTH: 3 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130081

COURSE TITLE
LRFD for Highway Bridge Superstructures - (4-Day ILT)

This updated course describes Load and Resistance Factor Design (LRFD) for steel and concrete highway bridge superstructures. It provides a combination of instructor-led discussions and workshop exercises. The course also includes LRFD theory applied to design examples and illustrates step-by-step LRFD design procedures. The curriculum follows the AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014 (AASHTO LRFD), including the approved 2015 Interims. The training includes the extensive use of student exercises and example problems to demonstrate overall design, detailing, and construction principles addressed in the reference materials. It affords hands-on experience in LRFD design and detailing of highway bridge superstructures. The curriculum materials are comprised of a comprehensive reference manual (FHWA Publication No. FHWA-NHI-15-047), lecture and workshop exercises intended to promote or enhance a working knowledge of AASHTO LRFD, and a participant workbook for lecture notes and exercises.

The curriculum includes the following major topics:
* Generals superstructure design considerations
* Preliminary design concepts for steel I-girder superstructures
* Steel I-girder design
* Preliminary design concepts for prestressed concrete superstructures
* Prestressed concrete I-girder design
* Spliced prestressed concrete girder bridges

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the bridge superstructure design and construction process in accordance with the current AASHTO LRFD specifications.
• Apply the appropriate current AASHTO LRFD specification articles dealing with selection of bridge type, size, and location.
• Apply the appropriate current AASHTO LRFD specification articles dealing with bridge economics.
• Apply the appropriate current AASHTO LRFD specification articles dealing with bridge materials.
• Describe the appropriate current AASHTO LRFD specification articles dealing with evolution of bridge design codes.
• Apply the appropriate current AASHTO LRFD specification articles dealing with bridge loads and load combinations.
• Apply the appropriate current AASHTO LRFD specification articles dealing with structural analysis.
• Apply the appropriate current AASHTO LRFD specification articles dealing with concrete bridge superstructure design.
• Apply the appropriate current AASHTO LRFD specification articles dealing with steel bridge superstructure design.
• Demonstrate the use of the current AASHTO LRFD specification requirements for superstructure design through the completion of step-by-step procedures, participant exercises, and design examples.

TARGET AUDIENCE
This course has been developed for the needs of practicing public and private sector structural engineers with one to ten years of experience. The primary audience is Agency and consultant structural designers. Pre-training Competencies: Individuals attending this course should have a minimum BSCE degree and should complete the Web-based Training Course NHI-130081P prior to the first day of class. They should also have a working knowledge of the current AASHTO LRFD and should have relevant design experience using this specification on at least one bridge superstructure.
TRAINING LEVEL: Intermediate

FEE: 2022: $1125 Per Person; 2023: $1200 Per Person

LENGTH: 4 DAYS (CEU: 2.5 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130081C

COURSE TITLE
LRFD Design of Common Bridge Elements: Decks and Bearings

This course was recently updated to reflect the current AASHTO LRFD Bridge Design Specifications, 9th Edition. This course provides training to explain the design considerations for decks and bearings. It provides a summary of general deck design procedures, including an introduction to different types of bridge bearings, and provides specific design steps for the design of elastomeric bearings and High-Load Multi-Rotational Bearings (HLMRBs).

OUTCOMES
Upon completion of the course, participants will be able to:

• Summarize deck design procedures, including the strip width and empirical design methods, and deck overhang design
• Identify different types of bridge bearings and their primary applications
• Identify elastomeric bearing components and list the steps required for their design
• Identify High-Load Multi-Rotational Bearing (or HLMRB) components and list the steps required for their design

TARGET AUDIENCE
The target audience for this course includes practicing public and private sector structural and bridge engineers with 0 to more than 20 years of experience. This includes agency and consultant structural designers, as well as project managers. Individuals taking these courses should have a minimum Bachelor of Science in Civil Engineering (BSCE) or equivalent degree. This course is intended for engineers that require experience with AASHTO bridge design provisions and updates.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 3 HOURS (CEU: .3 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130081D

COURSE TITLE
LRFD Steel I-Girder Details Design

This course was recently updated to reflect the current AASHTO LRFD Bridge Design Specifications, 9th Edition. This course provides training to apply the key LRFD limit state verifications for specific details associated with steel girders. It includes a description of the LRFD design requirements for stiffeners, shear connectors, cross-frames, diaphragms, welded connections, and bolted field splices.

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe the function, behavior, and LRFD design requirements for transverse and bearing stiffeners and shear connectors
• Describe the function, behavior, and LRFD design requirements for cross-frames, diaphragms, and both bolted and welded connections
• Describe the function, behavior, and LRFD design requirements for bolted field splices

TARGET AUDIENCE
The target audience for this course includes practicing public and private sector structural and bridge engineers with 0 to more than 20 years of experience. This includes agency and consultant structural designers, as well as project managers. Individuals taking these courses should have a minimum Bachelor of Science in Civil Engineering (BSCE) or equivalent degree. This course is intended for engineers that require experience with AASHTO bridge design provisions and updates.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 4 HOURS (CEU: .4 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130081E

COURSE TITLE
Prestressed Concrete Girder Topics

This course was recently updated to reflect the current AASHTO LRFD Bridge Design Specifications, 9th Edition. This course provides training to apply the key LRFD limit state verifications for prestressed concrete girders made continuous. It describes prestressed concrete bridge materials and prestressing losses and design considerations for prestressed girders made continuous.

OUTCOMES
Upon completion of the course, participants will be able to:

- Describe prestressed concrete bridge materials and the causes of prestressing force losses
- Describe design considerations and required computations for prestressed girders made continuous

TARGET AUDIENCE
The target audience for this course includes practicing public and private sector structural and bridge engineers with 0 to more than 20 years of experience. This includes agency and consultant structural designers, as well as project managers. Individuals taking these courses should have a minimum Bachelor of Science in Civil Engineering (BSCE) or equivalent degree. This course is intended for engineers that require experience with AASHTO bridge design provisions and updates.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 2 HOURS (CEU: .2 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-130081P

Course Title
General Superstructure Design Considerations (Web-based)

Disregard the class seat size noted in the course description for this specific course since as this is a self-paced web-based training (WBT). This course, 130081P, serves as a WBT prerequisite to the following ILTs:

130081,
130081A, and
130081B

This course provides training on the fundamentals for LRFD highway superstructure design. This includes a basic understanding of LRFD development and implementation, general design and location features related to superstructure design, and the primary loads and load combinations used for superstructure design. This course is a prerequisite to the Instructor-Led Training (ILT) Courses 130081 LRFD for Highway Bridge Superstructures - Steel and Concrete (4-Day ILT), 130081A LRFD for Highway Bridge Superstructures - Steel (2-Day ILT), and 130081B LRFD for Highway Bridge Superstructures - Concrete (2-Day ILT), and it covers only general sections of the LRFD Specifications.

Outcomes

Upon completion of the course, participants will be able to:

• Describe the fundamentals of LRFD, the historical background of LRFD, and the basic components of LRFD for superstructure design
• Describe location features, basic design objectives, principles of bridge aesthetics, and constructability issues for superstructure design
• Describe the primary loads, load combinations, and load factors used for steel and concrete superstructure design

Target Audience

The target audience for this course is practicing public and private sector structural and bridge engineers with 0 to 20 years of experience. This includes agency and consultant structural designers, as well as project managers. Individuals taking this course should have a minimum Bachelor of Science in Civil Engineering (BSCE) or equivalent degree. This course is intended for engineers that require experience with AASHTO bridge design provisions and updates. Additionally, participants wishing to take 130081, 130081A, or 130081B should have taken this WBT in advance of the first day of the ILT.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 3 Hours (CEU: .3 Units)

Class Size: Minimum: 20; Maximum: 40

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
**COURSE NUMBER**

FHWA-NHI-130087

**COURSE TITLE**

Inspection and Maintenance of Ancillary Highway Structures

This course provides training in the inspection and maintenance of ancillary structures, such as structural supports for highway signs, luminaries, and traffic signals. Its goal is to provide agencies with information to aid in establishing and conducting an inspection program in accordance with the FHWA “Guidelines for the Installation, Inspection, Maintenance, and Repair of Structural Supports for Highway Signs, Luminaries, and Traffic Signals.”

**OUTCOMES**

Upon completion of the course, participants will be able to:

- List and identify common visible weld defects
- Identify appropriate nondestructive testing techniques
- Identify factors that lead to corrosion and explain mitigation methods used in ancillary structures
- Define the severity of observed defects in accordance with the FHWA guidelines
- Identify defects in base/anchor rod installations
- List key issues in construction inspection of ancillary structures
- Identify repair techniques and discuss their use

**TARGET AUDIENCE**

Structural engineers, material engineers, traffic engineers, field inspectors, construction supervisors, maintenance personnel, and other technical personnel involved in the installation, inspection, maintenance, and repair of ancillary highway structures. This course is not a design course; however, the information should be helpful to those working in design and specification of ancillary structures.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $800 Per Person; 2023: $850 Per Person

**LENGTH:** 2 DAYS (CEU: 1.1 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130091

COURSE TITLE
Underwater Bridge Inspection

The latest changes to the National Bridge Inspection Standards (NBIS), which became effective January 13, 2005, require FHWA-approved bridge inspection training for all divers conducting underwater inspections. One method of meeting this requirement is the completion of an FHWA-approved underwater diver bridge inspection training course. Satisfactory completion of this 4-day course will fulfill the NBIS requirement.

This course provides an overview of diving operations that will be useful to agency personnel responsible for managing underwater bridge inspections.

Course topics include: methods of underwater inspection, underwater material deterioration mechanisms and inspection techniques, scour inspection techniques, underwater element-level rating, and underwater bridge inspection training. A final examination based on course content will be administered to participants.

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain the need and benefits of inspecting the underwater portions of bridge structures
• Describe typical underwater defects and deterioration, and identify conditions contributing to rates of deterioration
• Identify the types of inspection equipment available, and the advantages and limitations of each
• Identify procedures for planning and performing thorough and safe underwater bridge inspections
• Assign component and element level condition ratings for underwater components in accordance with NBIS and agency requirements

TARGET AUDIENCE
The course is intended for trained divers who require a knowledge base of underwater bridge inspection and evaluation techniques in order to meet the educational requirements of the NBIS for underwater bridge inspection training. The course would also be of interest to non-diver bridge inspectors, and FHWA, state, and local agency structural engineers.

TRAINING LEVEL: Basic

FEE: 2022: $1000 Per Person; 2023: $1100 Per Person

LENGTH: 4 DAYS (CEU: 2.4 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Title

Underwater Bridge Repair, Rehabilitation, and Countermeasures

Underwater Bridge Repair, Rehabilitation, and Countermeasures is a two-day course that will provide training to design engineers, construction inspectors, resident engineers and inspection divers in techniques for selecting and executing repairs to below water bridge elements. The primary goal of this course is to enable design engineers to select, design, and specify appropriate and durable repairs to below water bridge elements. A secondary goal of this course is to train staff in effective construction inspection of below water repairs. This course may be presented as a follow-up to NHI Course No. 130091A, Underwater Bridge Inspections.

Outcomes

Upon completion of the course, participants will be able to:

- Determine whether below water repairs can be completed “in the wet”, or require a cofferdam (or similar).
- Describe typical environmental constraints to performing repairs below water.
- Describe three methods of achieving a dry construction site within a body of water.
- List three attributes of good concrete repair mix designs.
- Describe the differences between flexible and rigid concrete forming systems.
- Describe underwater concrete placement techniques.
- Write installation procedures for pile jackets.
- Describe three methods for repair of pier scour.
- Describe the benefits of cathodic protection for bridge substructures.
- Describe four stages of underwater repair activities for underwater construction inspection.

Target Audience

The course is intended for design engineers, construction inspectors, resident engineers and inspection divers who may be engaged in the design, specifications or inspection of repairs to bridge elements located in and below water. The course may be of interest to contract administrators responsible for bridge repair or rehabilitation projects. It is expected that participants will have a working knowledge of bridge terminology, construction materials, and traditional repair techniques. Participants may also have backgrounds in bridge maintenance, repair, or construction. The audience will include persons with a range of education and technical backgrounds.

Training Level: Basic

Fee: 2022: $750 Per Person; 2023: $800 Per Person

Length: 2 DAYS (CEU: 1.4 UNITS)

Class Size: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-130092

Course Title
Load and Resistance Factor Rating of Highway Bridges

This course provides novice and experienced bridge engineers with the fundamental knowledge necessary to apply the most recent AASHTO LRFR Specifications to bridge ratings. This course introduces participants to applications of LRFR specifications that can be used to enhance bridge safety and to identify and discuss the steps to ensure successful transition to this new state-of-the art methodology.

Load Rating of Concrete and Steel Superstructure Bridges will provide participants with in-depth training in evaluating reinforced and prestressed concrete bridges and steel bridges using LRFR methodology. This course will illustrate the use of the current AASHTO evaluation specifications and state-of-the art evaluation methods with step-by-step examples.

Outcomes
Upon completion of the course, participants will be able to:

• Describe the purpose of performing a load rating
• Identify the benefits of LRFR methodology
• Demonstrate the LRFR process and the general load rating equations
• Explain legal loads and their use in load rating
• Determine distribution factors for load rating
• Describe various state load rating programs
• State the LRFR limit states
• Select evaluation factors for load rating
• Describe the process for load posting and importance of load posting
• Describe the procedure for checking overload permits
• Demonstrate the application of LRFR requirements by completing load rating exercises
• Identify material deteriorations that affect load resistance of bridge components
• Calculate the flexural and shear resistance of a prestressed concrete girder for load rating
• Apply the load rating procedures for concrete slab bridges
• Describe the load rating of concrete culverts and substructures
• Calculate the flexural and shear resistance of a steel I-girder bridge for load rating
• Evaluate fatigue for load rating a steel girder bridge
• Describe the load rating of gusset plates and connections
• Describe the load rating of timber structures

Target Audience
The target audience for this course includes State DOT bridge and structures engineers and practitioners responsible for load rating of highway bridges. This includes engineers at all levels, including designers, consultants, reviewers, maintenance and management engineers, and load raters. Pre-training competencies: Individuals attending this course should have a minimum BSCE degree. They should also have a working knowledge of the current MBE and AASHTO LRFD and should have relevant experience using these specifications on at least one load rating project.
**Training Level:** Basic

**Fee:** 2022: $1300 Per Person; 2023: $1500 Per Person

**Length:** 4 Days (CEU: 2.4 Units)

**Class Size:** Minimum: 20; Maximum: 40

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130092V

COURSE TITLE
Load and Resistance Factor Rating of Highway Bridges (VIRTUAL DELIVERY)

130092V Load and Resistance Factor Rating of Highway Bridges is a 4-day, online virtual course that provides novice and experienced bridge engineers with the fundamental knowledge necessary to apply the most recent AASHTO LRFR Specifications to bridge ratings. This course introduces participants to applications of LRFR specifications that can be used to enhance bridge safety and to identify and discuss the steps to ensure successful transition to this new state-of-the-art methodology.

Load Rating of Concrete and Steel Superstructure Bridges will provide participants with in-depth training in evaluating reinforced and prestressed concrete bridges and steel bridges using LRFR methodology. This course will illustrate the use of the current AASHTO evaluation specifications and state-of-the-art evaluation methods with step-by-step examples.

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe the purpose of performing a load rating
• Identify the benefits of LRFR methodology
• Demonstrate the LRFR process and the general load rating equations
• Explain legal loads and their use in load rating
• Determine distribution factors for load rating
• Describe various state load rating programs
• State the LRFR limit states
• Select evaluation factors for load rating
• Describe the process for load posting and importance of load posting
• Describe the procedure for checking overload permits
• Demonstrate the application of LRFR requirements by completing load rating exercises
• Identify material deteriorations that affect load resistance of bridge components
• Calculate the flexural and shear resistance of a prestressed concrete girder for load rating
• Apply the load rating procedures for concrete slab bridges
• Describe the load rating of concrete culverts and substructures
• Calculate the flexural and shear resistance of a steel I-girder bridge for load rating
• Evaluate fatigue for load rating a steel girder bridge
• Describe the load rating of gusset plates and connections
• Describe the load rating of timber structures

TARGET AUDIENCE
The target audience for this course includes State DOT bridge and structures engineers and practitioners responsible for load rating of highway bridges. This includes engineers at all levels, including designers, consultants, reviewers, maintenance and management engineers, and load raters. Pre-training competencies: Individuals attending this course should have a minimum BSCE degree. They should also have a working knowledge of the current MBE and AASHTO LRFD and should have relevant experience using these specifications on at least one load rating project.
TRAINING LEVEL: Basic

FEE: 2022: $1300 Per Person; 2023: $1300 Per Person

LENGTH: 4 DAYS (CEU: 2.4 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 25

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-130093W

Course Title
Introduction to Earthquake Engineering

130093W Introduction to Earthquake Engineering is a Web-based Training (WBT) prerequisite to the 3-day 130093A Displacement-Based LRFD Seismic Analysis and Design of Bridges Instructor-led Training (ILT). The participants will generally be notified to take the WBT about 1 month before the 130093A ILT session and must complete it before the start of Day 1 of the ILT. This WBT consists of 5 lessons including: Introduction to Earthquake Seismology (Lesson 1); Damages to Bridges due to Strong Motion (Lesson 2); Single Degree-of-Freedom (SDOF) Systems and Response Spectra (Lesson 3); AASHTO Design Ground Motion Characterization (Lesson 4); and Introduction to Geotechnical Hazards (Lesson 5).

Outcomes
Upon completion of the course, participants will be able to:
• Describe basic concepts of plate tectonics and seismology
• Explain fundamental concepts of modern seismic design
• Identify parameters used to characterize earthquake ground motions
• Recognize the steps employed in a probabilistic seismic hazard analysis
• Characterize design ground motions in accordance with AASHTO
• List the different types of geotechnical hazards

Target Audience
The target audience for this course includes bridge and geotechnical engineers with 0 to 20 years of experience that are preparing to attend the 130093A Instructor-led Training.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 4 HOURS (CEU: .4 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
**Course Number**
FHWA-NHI-130095

**Course Title**
LRFD and Analysis of Curved Steel Highway Bridges

This five-day course expands the suite of FHWA services to assist State and local governments in a successful implementation of Load and Resistance Factor Design (LRFD). This course applies the principles of LRFD to the analysis and design of skewed and horizontally curved steel bridges. For structural applications, the curriculum follows the AASHTO LRFD Bridge Design Specifications, 5th Edition, 2010 (AASHTO LRFD Specifications). The training course focuses primarily on the analysis and design of skewed and horizontally curved steel I-girder bridges. However, the accompanying Reference Manual also includes design examples for horizontally curved steel box-girder bridges.

This course provides a combination of instructor-led discussions and workshop exercises. It includes LRFD theory applied to design examples, and it illustrates step-by-step LRFD design procedures for skewed and curved steel bridges. The course includes participant exercises in which students apply the LRFD principles to specific applications, guided walk-throughs in which the instructor guides the participants through design examples, case studies in which real-life examples are used to illustrate the principles being learned, as well as models to help participants observe firsthand the behavior of skewed and curved bridges.

The curriculum materials are comprised of a comprehensive Reference Manual, lecture and workshop exercises intended to promote and enhance a working knowledge of the AASHTO LRFD Specifications as they apply to skewed and curved steel bridges, and a Participant Workbook containing slides, design examples, exercises, narrative descriptions and room for participant notes.

The curriculum material contains the following major topics:
1. General introduction (course introduction and overview)
2. Fundamentals (system behavior, torsion and live load force effects)
3. Structural analysis (general analysis considerations, bearing constraints, approximate methods, 2D refined methods, 3D refined methods and recommended level of analysis)
4. Design (preliminary design decisions, girder design verifications and design detail items)
5. Fabrication and construction

**Outcomes**
Upon completion of the course, participants will be able to:

- Describe the bridge superstructure analysis, design, fabrication and construction process for skewed or horizontally curved steel I-girder superstructures and for horizontally curved steel box-girder superstructures in accordance with the AASHTO LRFD Specifications
- Illustrate the application of the AASHTO LRFD Specifications to the analysis and design process for skewed and curved steel-bridge superstructures, taking into account erection and construction considerations
- Demonstrate understanding of analysis and design specification requirements for skewed and curved steel girder bridges through the completion of participant exercises and guided walk-throughs and the review of design examples

**Target Audience**
This course has been developed for the needs of practicing public and private sector structural and bridge engineers with 0 to approximately 20 years of experience. The primary audience is Host Agency and consultant structural designers. Pre-training Competencies: Individuals attending this course should have a minimum BSCE degree and have a working knowledge of the current AASHTO LRFD Specifications or the AASHTO Standard Specifications for Highway Bridges. They should also have relevant design experience using either of these specifications on at least one bridge superstructure.
**TRAINING LEVEL:** Basic

**FEE:** 2022: $1400 Per Person; 2023: $1550 Per Person

**LENGTH:** 5 DAYS (CEU: 4 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130096

COURSE TITLE
Cable-Stayed Bridge Seminar

The National Highway Institute’s (NHI) one-day Cable-Stayed Signature Bridge Seminar is intended to provide participants with an introduction to planning, design, and construction of long-span, cable-stayed bridges. The seminar provides an overview of the features of cable-stayed bridges; their construction and maintenance considerations; and analyses needed to design these highly redundant structures including special aerodynamic studies.

This seminar will engage participants through Instructor-led presentations, discussions, Q&A, group activities, and walkthrough examples. Participants will review a case study to help them understand how the curriculum can be applied to making basic design decisions. Major topics covered include: bridge configurations, construction methodology, component details, analysis, aerodynamics, design methodology, construction engineering, and maintenance and inspection. As part of the seminar, participants will receive a copy of FHWA Design Guidelines for the Arch and Cable-Supported Signature Bridges.

As a result of the seminar, participants will become familiar with the features of, construction and maintenance considerations; and analyses needed to design cable-stayed bridges.

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe the benefits of the cable-stayed bridge as a structure type over other alternatives
• Identify possible span and cable arrangements
• Compare steel, concrete or composite superstructure types
• Select possible pylon shape
• Define the general approaches for erecting steel and concrete cable-stayed bridges
• Define the roles and responsibilities of the owner, contractor and construction engineer
• Identify the needs for aerodynamics studies, testing and evaluation, and discuss practical solutions to mitigate wind effects

TARGET AUDIENCE
The primary target audience includes bridge engineers with 10 to 30 years of experience.

TRAINING LEVEL: Basic

FEE: 2022: $650 Per Person; 2023: $650 Per Person

LENGTH: 1 DAYS (CEU: .6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-130099A

Course Title
Bridge Inspection Nondestructive Evaluation Seminar (BINS)

The FHWA Office of Infrastructure R&D, in cooperation with the FHWA Office of Bridge Technology and the FHWA Resource Center, has identified a need for training in select nondestructive evaluation (NDE) methods that can be used to assess existing conditions on highway bridge structures during routine inspections. These NDE methods can also be used to supplement visual inspections of highway bridge structures.

The Bridge Inspector Nondestructive Evaluation Seminar (BINS) is a two-day course which provides bridge inspectors and managers the ability to learn about the latest in commercially available nondestructive tools and systems for use on bridges. The seminar is presented through a series of slides, instructional videos, and video demonstrations showing basic operation of the equipment. The training has been fully developed in conjunction with the FHWA's NDE Validation Center and is delivered by qualified instructors experienced in using NDE equipment on bridges.

This seminar is designed to provide bridge inspection staff the opportunity to view efficient and effective inspection tools and techniques with the ultimate goal of achieving safer bridges through more reliable bridge inspections. The following NDE methods are discussed: Eddy Current, Ultrasonic Testing, Infrared Thermography, Impact Echo, Ultrasonic Surface Waves, Ground Penetrating Radar, Acoustic Emission, Magnetic Particle, Radiographic, Pulse Velocity, Pulse Echo, Pachometers, Physical Sounding Methods, and Electrical Methods. Additionally, other commonly used equipment will be briefly introduced with basic information provided about attributes in an easy to use reference table and select extra information in the appendix.

Outcomes
Upon completion of the course, participants will be able to:

• Summarize the National Bridge Inspection Program (NBIP) expectations as they relate to NDE
• Compare the various stress wave NDE methods as used in steel bridge inspection
• Demonstrate understanding of stress wave and electromagnetic methods by choosing applicable NDE methods for specific defects
• Summarize how NDE was used to assist decision makers in the repair of the Sherman Minton Bridge
• Restate the theories, applications, advantages and limitations of various NDE testing methods
• Compare the theories and applications of various acoustic stress wave testing methods for concrete and timber inspections
• Demonstrate an understanding of electromagnetic and electric NDE methods in bridge inspection programs
• Summarize feasible methods used to evaluate the deck on the Arlington Memorial Bridge (AMB)

Target Audience
The primary target audience for the Bridge Inspection Non-Destructive Evaluation Seminar (BINS) course is federal, state, and local highway bridge inspectors, bridge management staff, and consultants. Individuals involved in material testing, as well as transportation structure design and construction, will find the information useful to ensure quality. Prior to taking this course, participants should have a broad basic knowledge of physics and engineering principles, a knowledge of the basic bridge inspection fundamentals, a background in bridge engineering or completion of NHI course FHWA-NHI-130054 Engineering Concepts for Bridge Inspectors (strongly recommended), and experience with bridge inspection.
TRAINING LEVEL: Basic

FEE: 2022: $750 Per Person; 2023: $750 Per Person

LENGTH: 2 DAYS (CEU: 1.9 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Introduction to Safety Inspection of In-Service Bridges - WEB-BASED

This training is a prerequisite of another NHI training and is offered at no cost.

Introduction to Safety Inspection of In-Service Bridges is designed to prepare participants with the necessary fundamentals required for a more intensive course in bridge inspection. This WBT introduces the elementary concepts of bridge inspection, bridge functions, and bridge inspection terminology. Participants who complete this WBT will be prepared for more intensive courses in bridge inspection, which focus on documentation, rating, assessment, and field inspection.

Introduction to Safety Inspection of In-Service Bridges covers bridge components and elements, bridge mechanics, design features, bridge materials, decks, superstructures, bearings, substructures, channels, inspection preparations, inspection reporting activities, and work area safety.

This course prepares participants for the 2-week, intensive Instructor-led course in bridge inspection, 130055 Safety Inspection of In-Service Bridges.

Upon successful completion of 130101, participants will have met the prerequisite requirement for participation in the 130055 course (for sessions beginning March 5, 2012 or later).* If participants would like to enroll in the 130055 course, they will be required to demonstrate their certificate of completion for 130101 as proof that the prerequisite requirement has been fulfilled.

Participation in 130101 is not the only option to fulfill the prerequisite requirement for 130055.* Individuals have the option to 1) successfully complete NHI-130054 Engineering Concepts for Bridge Inspectors (Instructor-led course) or 2) for those with engineering backgrounds or prior knowledge and experience in the field of bridge inspection may “test-out” through a Web-based assessment (130101A Introduction to Safety Inspection of In-Service Bridges).

*Please note: Upon successful completion of this prerequisite course, you will be eligible to take the 130055 training course for up to 2 years.

OUTCOMES

Upon completion of the course, participants will be able to:

- Describe the basis for bridge inspection
- Identify the three major bridge components and various culvert types
- Identify the various elements that comprise bridge components
- Describe standard highway bridge loadings
- Describe the basic concepts of elasticity of materials, response of materials to an applied force, response of structural members to a variety of loadings, the relationship between stresses and strains, and load rating
- Describe span arrangements, deck-superstructure interaction, and redundancy
- Describe the basic properties, strengths and weaknesses of steel, concrete, and timber
- Describe the types, signs and causes of structural distress in steel, concrete, and timber
- Describe the general purpose of decks, superstructures, and bearings
- Describe the general purpose and function of substructure units
- Describe waterway features and the effect of scour
- Describe the requirements for preparing for an inspection
- Describe the basic bridge inspection reporting requirements
- Name protective measurements to mitigate the hazards involved when working in the field performing bridge inspection

TARGET AUDIENCE

This training has been developed for Federal, State, and local highway agency employees and consultants involved in inspecting bridges or in charge of a bridge inspection unit. A background in bridge engineering is strongly recommended.
**TRAINING LEVEL:** Basic

**FEE:** 2022: $0 Per Person; 2023: $0 Per Person

**LENGTH:** 14 HOURS (CEU: 1.4 UNITS)

**CLASS SIZE:** MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Prerequisite Assessment for Safety Inspection of In-Service Bridges - WEB-BASED

This training is a prerequisite of another NHI training and is offered at no cost.

Prerequisite Assessment for Safety Inspection of In-Service Bridges (FHWA-NHI-130101A) is a required prerequisite necessary for those interested in taking the course Safety Inspection of In-Service Bridges (FHWA-NHI-130055). The assessment is divided into three sections; participants are given three opportunities to pass each section with a score of 70% or better. Passing all three assessment sections signifies successful completion.

The assessment covers a range of topics that includes the bridge inspection program, bridge components and elements, bridge mechanics, design features, bridge materials, decks, superstructures, bearings, substructures, channels, inspection preparations, inspection reporting activities, and work area safety. To access this online assessment, enroll in NHI 130101A “Prerequisite Assessment for Safety Inspection of In-Service Bridges” via the NHI Web site.

Upon successful completion of 130101A, participants will have met the prerequisite requirement for participation in the 130055 Safety Inspection of In-Service Bridges course (for sessions beginning March 5, 2012 or later).* If participants would like to enroll in the 130055 course, they will be required to demonstrate their certificate of completion for 130101A as proof that the prerequisite requirement has been fulfilled.

Participation in 130101A is not the only option to fulfill the prerequisite requirement for 130055.* Individuals have the option to 1) successfully complete NHI-130054 Engineering Concepts for Bridge Inspectors (Instructor-led course) or 2) successfully complete the Web-based training and assessment (130101 Introduction to Safety of In-Service Bridges)

*Please note: Upon successful completion of this prerequisite course, you will be eligible to take the 130055 training course for up to 2 years.

OUTCOMES

Upon completion of the course, participants will be able to:

• There are no course outcomes associated with this prerequisite assessment.

TARGET AUDIENCE

This assessment has been developed for Federal, State, and local highway agency employees and consultants involved in inspecting bridges or in charge of a bridge inspection unit. A background in bridge engineering is strongly recommended.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-130102

Course Title
Engineering for Structural Stability in Bridge Construction (3 Day)

The objective of this course is to train participants on the behavior of steel and concrete girder bridges during construction and teach them to identify vulnerabilities and engineering methods to investigate the structure’s strength and stability at each critical stage. This is done within the practical context of engineering, development, verification, and/or review of erection plans.

Starting with basic structural stability principles, course participants are introduced to stability analysis methods and how they should be applied to properly engineer a bridge erection plan. The role of both permanent and temporary bracing in achieving structural stability is covered, and methods for bracing design presented. Behavior and design considerations for construction phases are provided through presentation of case studies, demonstrations, design examples, and guided walk-throughs. The impacts of construction practices, means, and methods are explored and demonstrated.

During bridge erection, the member support conditions, loads, stresses, strength, and stability are affected by the erection practices such as lifting, installation of bracing, bearing conditions, temporary supports, and placing sequence. Deck placing equipment, overhang brackets and staging can also have significant effects on girder stability. Thus, this course presents information on construction practices as it relates to these considerations.

Engineering criteria for use in evaluating bridges during erection are presented. Loading criteria and load factors for analysis are provided along with discussion of their applicability. Equations for checking member conditions during erection are included. Participants learn how loads during construction differ from final design conditions and appropriate methods to compute and apply those loads. The required contents of erection engineering plans, procedures, and submittals are presented in the course. Check lists are included to assist both the erection engineer and submittal reviewer.

The extended Course 130102A (4.0 days) provides an additional 8 hours of hands-on practicum where participants are given opportunity to apply advanced stability analysis on real-world examples, using software executed on laptop computers. This provides a valuable “capstone” experience to solidify their understanding, relate curriculum to practice, apply the concepts presented, and engage in self-discovery.

Outcomes
Upon completion of the course, participants will be able to:

- Explain the fundamentals of stability theory and how they affect bridge strength and performance during construction
- Describe the differences between local, girder, and system (global) stability limit states
- Recognize the potential for stability-related failures that have occurred in past bridges and how to effectively avoid similar results
- Select loads, load combinations, and factors that are appropriate for the construction plan verification
- Explain common techniques for evaluating the stability of bridge member and components
- Choose an appropriate advanced stability analysis for a critical construction stage where stability is in question
- Describe the role of bracing and shoring and how to use for providing stability
- Assess procedures and details for a construction plan that will be safe and economical

Target Audience
This course has been developed for the needs of practicing public and private sector structural engineers with zero to approximately twenty years of experience. The primary audience is Host Agency and consultant bridge structural engineers and project managers, particularly those who prepare and/or review erection plans and procedures. The course will also be of benefit to bridge contractors and erectors as well as those Agency staff overseeing bridge erection.
**TRAINING LEVEL:** Basic

**FEE:** 2022: $1100 Per Person; 2023: $1100 Per Person

**LENGTH:** 3 DAYS (CEU: 2 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130103

COURSE TITLE
Post-Tensioning Tendon Installation and Grouting - WBT

Post-Tensioning Tendon Installation and Grouting Web-based Training (WBT) delivers content on post-tensioning principles, system components, and installation procedures - including quality control procedures - which will assist supervisors, inspectors, and construction inspectors in the performance of their job. This WBT provides guidance to individuals involved in the design, installation, grouting, and inspection of post-tensioning tendons for prestressed concrete bridges and is intended to be an online complement to the Post-Tensioning Tendon Installation and Grouting Manual. Participants who complete this WBT will have a general understanding of post-tensioning components, construction, as well as testing and acceptance procedures. This WBT will better prepare individuals for more intensive certification courses in post-tensioning installation and grouting (PTI Level 1 & 2 PT Field Specialist and ASBI Grouting Certification Training).

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe the use of post-tensioning to prestress concrete bridges
• Describe the composition and essential features of prestressing steel and anchorages
• Describe the composition and essential features of ducts and grout
• Describe the testing and acceptance procedures for post-tensioning system materials and components
• Describe post-tensioning tendon component installation, including the role of post-tensioning shop drawings in the construction process
• Describe the operations required to stress post-tensioning tendons
• Describe the importance and proper methods for calibrating jacks and their role in on-site testing for friction and modulus of elasticity
• Describe the elements of grouting operations
• Identify the methods, materials, and details that provide satisfactory corrosion protection

TARGET AUDIENCE
This training is targeted at owners and private company personnel that may be involved in the design, inspection, and construction of bridges that contain PT tendons. This course is intended for those with beginner to intermediate knowledge and/or skills in the area post-tensioning tendon installation and grouting principles and practices.

TRAINING LEVEL: Basic

FEE: 2022: $50 Per Person; 2023: $0 Per Person

LENGTH: 6 HOURS (CEU: .6 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-130105A

Course Title
Introduction to FRP Materials and Applications for Concrete Structures, WEB-BASED

Introduction to FRP Materials and Applications for Concrete Structures is designed to assist State Department of Transportation (DOT) construction and maintenance operation staff develop knowledge of the types of FRP Composite material, form, and properties used in the repair and retrofit of concrete structures, as well as versatility in applications of FRP in the repair of concrete structures.

Topics covered in this course include:
- Background of FRP material development in bridge applications
- Different types of FRP Composite material (Fiber and Resin)
- Common concrete superstructure and substructure defects that are candidates for FRP repair and retrofit
- Versatility in the application of FRP in the repair and retrofit of common concrete structure defects
- Benefits of FRP repairs and retrofits for concrete structures over traditional methods

The success of repairs of concrete structures using FRP Composites is dependent on choosing FRP material suitable for the application. It is essential to develop knowledge of FRP material, properties, and suitable application.

Outcomes
Upon completion of the course, participants will be able to:
- Describe the application of FRP materials for concrete structures.
- Describe the different methods of repairing and retrofitting concrete structures using FRP materials.

Target Audience
This training is appropriate for persons with minimal or no experience in bonded repair and retrofit of concrete structures using FRP Composites, as well as those experienced with using FRP Composite. The course focuses on construction areas, however, bridge designers as well as field personnel will benefit from the content.

Training Level: Basic

Fee: 2022: $50 Per Person; 2023: $0 Per Person

Length: 3 HOURS (CEU: .3 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-130105B

Course Title
Construction Procedures and Specifications for Bonded Repair and Retrofit of Concrete Structures

Construction Procedures and Specifications for Bonded Repair and Retrofit of Concrete Structures using FRP Composites is designed to assist State Department of Transportation (DOT) construction and maintenance operation staff develop knowledge of project requirements of FRP repairs, substrate surface preparation methods, and procedures and steps for installation of FRP systems.

Topics covered in this course include:
- Specifications, including scope, definitions, tolerances, and site considerations
- Submittal requirements, including working drawings and quality control/quality assurance plans
- Storage, handling, and disposal requirements, including shelf life, safety hazards, personnel and work place protection, and clean up
- Various aspects of substrate repairs and surface preparation of concrete structures
- Use of externally-bonded and near-surface mounted FRP systems for repairs
- Procedures and steps for installation of externally bonded FRP systems
- Procedures and steps for installation of near-surface mounted FRP systems
- Environmental considerations for FRP installation
- Identification of defects and appropriate solutions of FRP applications

The success of repairs and retrofit of concrete structures using FRP Composite is dependent on State Department of Transportation (DOT) construction personnel taking an active role in ensuring construction procedures and specifications are adhered to. Hence, knowledge of proper construction procedures and specifications for FRP projects is necessary to control quality of work.

Outcomes
Upon completion of the course, participants will be able to:
- Identify the general project requirements for FRP repair and retrofit of concrete structures.
- Explain the general procedures for FRP repair and retrofit of concrete structures.
- Describe the general installation procedures of FRP systems for repair and retrofit of concrete structures.

Target Audience
This training is appropriate for persons with minimal or no experience in bonded repair and retrofit of concrete structures using FRP Composites, as well as those experienced with using FRP Composite. The course focuses on construction areas, however, bridge designers as well as field personnel will benefit from the content.

Training Level: Basic

Fee: 2022: $50 Per Person; 2023: $0 Per Person

Length: 5 HOURS (CEU: .5 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-130105C

Course Title
Quality Control of Repair and Retrofit of Concrete Structures Using FRP Composites

Quality Assurance and Construction Process Control of Bonded Repair and Retrofit of Concrete Structures Using FRP Composites is designed to assist State Department of Transportation (DOT) construction and maintenance operation staff develop knowledge of the requirements of quality assurance and quality control during construction, and equip them with the necessary means to control the application of the repair system and the adequacy of the construction process.

This course covers the following topics:

- Responsibilities and qualifications of personnel implementing Quality Control and Quality Assurance (QC/QA) program for FRP application
- Requirements of Quality control and Quality Assurance (QC/QA) for FRP applications
- Application of Quality Control and Quality Assurance (QC/QA) for FRP application
- Inspection methods and acceptance criteria for FRP application
- Threshold values of concrete surface preparations and construction tolerances
- Key elements of Process Control Manual and checklists for inspection of FRP systems
- Examples of defective work, repair for defects, and acceptance criteria for repairs

The success of repairs of concrete structures using FRP Composite is dependent on quality control of materials and workmanship, secured by quality assurances processes.

Outcomes
Upon completion of the course, participants will be able to:

- Explain the quality assurance methods of FRP repair and retrofit of concrete structures.
- Explain the inspection methods for FRP repair and retrofit of concrete structures.
- Describe the procedures for repairs of defective FRP work.

Target Audience
This training is appropriate for persons with minimal or no experience in bonded repair and retrofit of concrete structures using FRP Composites, as well as those experienced with using FRP Composite. The course focuses on construction areas, however, bridge designers as well as field personnel will benefit from the content.

Training Level: Basic

Fee: 2022: $50 Per Person; 2023: $0 Per Person

Length: 5 HOURS (CEU: .5 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-130107A

Course Title
Fundamentals of Bridge Maintenance WBT

Fundamentals of Bridge Maintenance (NHI-130107A) teaches the participant the fundamental aspects of an effective bridge maintenance program. Module 1 - Introduction to Bridge Maintenance explains the importance of a balanced bridge maintenance program and the organizational structure, roles, and responsibilities of a bridge maintenance unit. Module 2 - Bridge Maintenance Management provides basic information about bridge inspections, reviews the general concept of Maintenance Management Systems (MMS) and Bridge Management Systems (BMS), reviews the various steps and activities involved in the proper planning and implementation of bridge maintenance program activities, discusses commonly used contracting bridge maintenance methods, and describes the principles of quality assurance and quality control measures used in bridge maintenance. Module 3 - Bridge Anatomy introduces bridge components, associated elements, and their intended functions, and also reviews common bridge types. Module 4 - Bridge Mechanics explains the bridge mechanics as it relates to different bridge components, introduces concepts such as redundancy and fracture critical details, and reviews basic hydraulic, scour and channel erosion concepts. Module 5 - Concrete Basics addresses the basic material properties of concrete; describes proper concrete mixing and testing processes; summarizes proper concrete placement, finishing and curing processes; and reviews proper methods for locating and removing unsound concrete. Module 6 - Maintenance of Bridge Ancillary Items examines general maintenance considerations and practices related to ancillary items often attached to bridges, such as utilities, and sign and lighting structures. This web-based training serves as a prerequisite to the 4-day instructor-led training NHI-130108 Bridge Maintenance.

Outcomes
Upon completion of the course, participants will be able to:

• Describe common organizational structures of transportation agencies, the role of the bridge maintenance unit and where it fits within such organizations, and the various cost-effective maintenance and preservation activities that these units perform
• Review various bridge maintenance program management activities and tools used to facilitate the accomplishment of these activities
• Classify bridge components, associated elements, and their intended function for commonly used materials
• Review the fundamentals of bridge mechanics and behaviors
• Review the fundamental steps involved in using concrete as a repair material
• Describe general maintenance practices associated with bridge mounted sign and lighting structures

Target Audience
The target audience for course 130107A, Fundamentals of Bridge Maintenance Web-Based Training is primarily members of Federal, State, and Local Departments of Transportation, as well as those contractors that perform work on behalf of these agencies. This training is primarily geared for individuals involved in onsite bridge maintenance activities and those that supervise the activities. This training is appropriate for those with basic knowledge of bridge maintenance and repair activities.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 7 HOURS (CEU: .7 UNITS)

Class Size: Minimum: 500; Maximum: 500

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-130107C

Course Title
Maintenance of Movable Bridges

NHI-130107C Maintenance of Movable Bridges will support a geographically dispersed audience with varying amounts of experience and education who have responsibility for maintaining in-service movable bridges. Learners will gain basic knowledge of the common types and terms related to movable bridges, as well as the various operational components they need to be familiar with in order to maintain them. Further, this course will emphasize the lubrication of movable bridge components, including the types of lubricants used and special considerations in regards to their selection as this one of the most important preventive maintenance activities associated with movable bridges. Finally, this course will provide basic knowledge on the most frequently used preventive maintenance activities associated with the various components and systems encountered on movable bridges.

Outcomes
Upon completion of the course, participants will be able to:
• Review common types of movable bridges and their operational components
• Recognize the importance of lubrication of movable bridge components
• Describe maintenance considerations of movable bridge operational components and systems
• Emphasize the importance of an Operation & Maintenance (O&M) Manual for each movable bridge

Target Audience
The target audience for this course is primarily members of Federal, State, and Local Departments of Transportation, as well as contractors performing work on behalf of these agencies. This training is primarily geared toward individuals involved in onsite bridge maintenance activities and those that supervise and manage these activities. This training is appropriate for those who possess basic knowledge of bridge maintenance activities and wish to gain specific expertise in bridge painting practices. Participants should possess basic knowledge of bridge maintenance and repair activities at a minimum before taking this course.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 4 Hours (CEU: .4 Units)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130107D

COURSE TITLE
Maintenance of Masonry Bridge Elements

NHI-130107D Maintenance of Masonry Bridges supports a geographically dispersed audience with varying amounts of experience and education who are responsible for maintaining in-service bridges constructed of masonry. Learners will gain basic knowledge of the materials and defects associated with masonry bridges, as well as the preventive maintenance activities and repair techniques used to address deterioration.

OUTCOMES
Upon completion of the course, participants will be able to:

• Review common materials used in masonry bridges and their associated defects
• Describe preventive maintenance and repair techniques for masonry bridges

TARGET AUDIENCE
The target audience for course NHI-130107D Maintenance of Masonry Bridges is primarily members of Federal, State, and Local Departments of Transportation, as well as contractors performing work on behalf of these agencies. This training is primarily geared toward individuals involved in onsite bridge maintenance activities and those that supervise and manage these activities. This training is appropriate for those who possess basic knowledge of bridge maintenance activities and wish to gain specific expertise in the maintenance and repair of masonry bridges. Participants should possess basic knowledge of bridge maintenance and repair activities at a minimum before taking this course.

TRAINING LEVEL: Basic

FEE: 2022: $25 Per Person; 2023: $0 Per Person

LENGTH: 2 HOURS (CEU: .2 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-130108

Course Title
Bridge Maintenance (ILT)

Replacing the original Bridge Maintenance course (FHWA-NHI-134029), this entirely new Instructor-led Training (ILT) course will provide participants with knowledge regarding common deficiencies that occur in bridges, common defects in bridge elements, preventive maintenance techniques, and protective systems intended to prevent deterioration and deficiencies in bridges. With this knowledge, this course will enable participants to investigate proper bridge maintenance procedures using bridge maintenance resources and apply these practices on-the-job.

WEB-BASED TRAINING (WBT) PREREQUISITE: It is strongly recommended that participants take and complete FHWA-NHI-130107A Fundamentals of Bridge Maintenance WBT prerequisite prior to taking this 4-day ILT. This prerequisite WBT is being offered free of charge to participants.

Outcomes
Upon completion of the course, participants will be able to:

• Identify key steps involved in the development and implementation efforts of a cost-effective preservation strategy for a group of bridges.
• Identify maintenance and/or repair needs and select the best remedial strategy.
• Discuss properties and preservation options involving common bridge materials such as concrete, steel and timber.
• Describe the step-by-step tasks required to accomplish proven preservation procedures on the various bridge elements.
• Identify critical members and avoid procedures that might result in damage such as field welding repairs on fracture critical tension members.
• Recognize problems that warrant specialized expertise, for example, soliciting the involvement of a qualified structural engineer when repairing structural damage.
• Apply effective management techniques (such as planning, scheduling, monitoring and reporting) during daily bridge maintenance operations.

Target Audience
This course is primarily for members of State and Local Departments of Transportation, as well as those contractors that perform work on behalf of these agencies. This training is primarily geared for individuals involved in on-site bridge maintenance and preservation activities and those that supervise and manage these activities. This training is appropriate for those with intermediate to advanced experience in bridge maintenance and repair activities. This training is also suitable for those with intermediate/advanced knowledge of general maintenance and repair activities that have successfully completed the prerequisite, FHWA-NHI-130107A Fundamentals of Bridge Maintenance WBT course. Those that are not involved in on-site bridge maintenance activities, such as designers and construction personnel, may also benefit from this training.

Training Level: Intermediate

Fee: 2022: $1050 Per Person; 2023: $1050 Per Person

Length: 4 DAYS (CEU: 2.3 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-130109A

Course Title
Bridge Management Fundamentals

When the average citizen commutes to work or runs errands, they are relying on us, public transportation agencies, to keep their bridges safe and available for use. It is their expectation that we keep their bridges serviceable and at the lowest life-cycle cost possible. Bridge management systems will help your agency to efficiently balance the various bridge needs against available resources. The Bridge Management Fundamentals course describes a bridge management system and walks through the process of selecting and implementing the right bridge management software for your agency. Throughout the course, you will learn direct from agencies with mature and successful bridge management systems about how they get the most utility from their system.

Outcomes
Upon completion of the course, participants will be able to:
- Explain the need for a BMS
- Describe a typical BMS organizational structure
- Describe the seven components of a BMS
- Describe tools that are used as part of the bridge management process
- Describe an implementation plan for a comprehensive BMS
- Describe effective practices when using BMSs
- Identify successful applications of BMS components by agencies
- Describe the bridge management process as it relates to an agency business model
- Describe how to address risk

Target Audience
The target audience includes Federal, State, and local bridge program managers; bridge management engineers; bridge management practitioners; transportation planners; and project planning and programming personnel. Additionally, transportation performance management team members, transportation asset management team members, bridge preservation and maintenance engineers, the financial management team, bridge inspectors, and bridge designers may benefit from this training. All participants should have knowledge of basic bridge terminology.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 4 HOURS (CEU: .4 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-130109B

Course Title
Performance-Based Management of Highway Bridges

The traditional approach to bridge management has focused on identifying the worst performing structures in the inventory and addressing their deficiencies before anything else. But as inventories expand and age and as budgets shrink, most agencies discover that even as they address the worst bridges in the inventory, other bridges that could have been saved through preservation activities slip into deficiency. Today, the public expects transportation agencies to adopt a performance-based management approach that will achieve the highest level of performance possible and make the most effective use of available funds. The Performance-based Management of Bridges course uses video-based testimonies from transportation professionals to illustrate the ways in which their agencies have used performance-based management to estimate the cost-effectiveness of decisions and assess risk.

Outcomes
Upon completion of the course, participants will be able to:

• Describe how a bridge management system supports a performance-based bridge program.
• Identify framework for a performance-based management business model;
• Describe the development of performance measures;
• Describe methods for determining cost-effectiveness of actions;
• Describe considerations when assessing risk; and
• Describe strategies for communicating and reporting highway bridge performance-based management actions and results to other agency stakeholders and the public

Target Audience
The target audience includes Federal, State, and local bridge program managers; bridge management engineers; bridge management practitioners; transportation planners; and project planning and programming personnel. Additionally, transportation performance management team members, transportation asset management team members, bridge preservation and maintenance engineers, the financial management team, bridge inspectors, and bridge designers may benefit from this training. All participants should have knowledge of basic bridge terminology.

Training Level: Basic

Fee: 2022: $50 Per Person; 2023: $0 Per Person

Length: 4 HOURS (CEU: .4 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130110

COURSE TITLE
Tunnel Safety Inspection

This 5-day, Instructor-led Training (ILT) is highly interactive and builds upon participants’ prior knowledge of tunnel and/or bridge inspection. This course covers the entire breadth of knowledge necessary to manage or execute a successful tunnel inspection based on the National Tunnel Inspection Standards (NTIS), Tunnel Operations, Maintenance, Inspection and Evaluation (TOMIE) Manual and Specifications for the National Tunnel Inventory (SNTI). However, it does not replace the need for specialized experts to assist in inspections. There are nine instructional modules. Once participants display achievement of the learning outcomes of one module, the class will progress to the next module. During the course, the instructor will lead participants through a series of case studies giving them an opportunity to practice and apply their knowledge in real-life tunnel inspection situations. The capstone case study will be a virtual tunnel inspection that takes place in a computer-simulated, 3D environment. Using this tool, participants will be able to perform a tunnel inspection and demonstrate their achievement of all learning outcomes.

*Participant Prerequisite Requirement: ALL participants should successfully complete one of the following three prerequisite requirements:

1. FHWA-NHI-130054 Engineering Concepts for Bridge Inspectors; or
2. FHWA-NHI-130101 Introduction to Safety Inspection of In-Service Bridges; or
3. FHWA-NHI-130101A Prerequisite Assessment for Safety Inspection of In-Service Bridges.

Prior to taking this course, it is strongly recommended that participants complete FHWA-NHI-130055 Safety Inspection of In-Service Bridges, FHWA-NHI-130056 Safety Inspection of In-Service Bridges for Professional Engineers, or possess equivalent field experience.

It is not required, but strongly recommended that participants possess some design or safety inspection experience of in-service tunnels or bridges.

Host Requirements: Hosts must provide a training room large enough to accommodate at least 30 participants as well as the 15 NHI virtual tunnel laptops (provided by NHI Instructors) that will be used for the virtual tunnel exercises. Additionally, the host must ensure that ALL students have successfully met the prerequisite requirement* and have a valid course completion certificate for one of the three prerequisite options.

OUTCOMES
Upon completion of the course, participants will be able to:

• Articulate the importance and purpose of tunnel inspection
• Apply the fundamentals of tunnel inspection
• Demonstrate the inspection and evaluation of tunnel structural, civil, mechanical, electrical, signage and lighting, and fire/life safety/security elements
• Use tunnel inspection references

TARGET AUDIENCE
The target audience for the Tunnel Safety Inspection ILT course is primarily members of Federal, State, local (Authority or Commission) and Tribal highway agency employees, who are involved with tunnel design, inspection and maintenance, as well as consultants involved in inspecting tunnels or in tunnel inspection management and leadership positions.
**TRAINING LEVEL:** Basic

**FEE:** 2022: $1400 Per Person; 2023: $1425 Per Person

**LENGTH:** 5 DAYS (CEU: 3.2 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130111

COURSE TITLE
Nondestructive Evaluation Fundamentals for Bridge Inspection (Web-based)

130111 Nondestructive Evaluation (NDE) Fundamentals for Bridge Inspection is an introductory course that exposes bridge inspectors to NDE technologies. This course defines and describes the progression of nondestructive evaluation bridge inspection, overview explanations of NDE techniques, and descriptions of the NDE approaches in terms of their applicability to the primary bridge materials of concrete, steel, and timber. The goal of 130111 Nondestructive Evaluation Fundamentals for Bridge Inspection is to provide learners with the necessary background to identify the primary NDE technologies to supplement bridge inspection, and the materials for which they are best suited. A secondary goal of this course is to provide a foundation for more in-depth study of the NDE topics covered in the WBT Course Series, Practical Applications of Nondestructive Evaluation for Bridge Inspection, which includes 130112A NDE for Concrete Bridge Elements, 130112B NDE for Steel Bridge Elements, and 130112C NDE for Timber and Other Bridge Elements.

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe the application of NDE technology to corrosion and related flaws.

• Describe the application of NDE technology to construction flaws including honeycombing, voids, and inadequate rebar cover

• Explain NDE investigation techniques of concrete bridge elements

TARGET AUDIENCE
The target audience for course 130111 includes public and private sector bridge inspectors, supervisors, project engineers, and others responsible for field inspection of in-service bridges. This will include personnel who may be engineers or technicians in positions such as bridge inspection program manager, bridge inspection project manager, bridge inspection team leader, bridge inspection team member, and FHWA Structural/Bridge Engineers.

TRAINING LEVEL: Basic

FEE: 2022: $50 Per Person; 2023: $0 Per Person

LENGTH: 6 HOURS (CEU: .6 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130112A

COURSE TITLE
NDE for Concrete Bridge Elements (Web-based)

130112A Nondestructive Evaluation (NDE) for Concrete Bridge Elements explains the “why” behind the approaches with theoretical explanations of the techniques, comparative costs of each approach, and their applicability to concrete as a primary bridge material. This course is the first of three courses in the WBT Course Series, Practical Applications of Nondestructive Evaluation for Bridge Inspection, which also includes 130112B NDE for Steel Bridge Elements and 130112C NDE for Timber and Other Bridge Elements. This Course Series (130112A, 130112B, 130112C) is a follow up to introductory course 130111 providing a more in-depth study of NDE topics.

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe the application of NDE technology to corrosion and related flaws
• Describe the application of NDE technology to construction flaws including honeycombing, voids, and inadequate rebar cover
• Explain NDE investigation techniques of concrete bridge elements

TARGET AUDIENCE
The target audience for course 130112A includes public and private sector bridge inspectors, supervisors, project engineers, and others responsible for field inspection of in-service bridges. This will include personnel who may be engineers or technicians in positions such as bridge inspection program manager, bridge inspection project manager, bridge inspection team leader, bridge inspection team member, and FHWA Structural/Bridge Engineers.

TRAINING LEVEL: Basic

FEE: 2022: $50 Per Person; 2023: $0 Per Person

LENGTH: 5 HOURS (CEU: .5 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130112B

COURSE TITLE
NDE for Steel Bridge Elements (Web-based)

130112B Nondestructive Evaluation (NDE) for Steel Bridge Elements explains the “why” behind the approaches with theoretical explanations of the techniques, comparative costs of each approach, and their applicability to steel as a primary bridge material. This course is the second of three courses in the WBT Course Series, Practical Applications of Nondestructive Evaluation for Bridge Inspection, which also includes 130112B NDE for Steel Bridge Elements and 130112C NDE for Timber and Other Bridge Elements. This Course Series (130112A, 130112B, 130112C) is a follow up to introductory course 130111 providing a more in-depth study of NDE topics.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the application of NDE technology to evaluate the remaining section of steel
• Describe the application of NDE technology to detect cracks in steel
• Explain NDE investigation techniques of steel bridge elements

TARGET AUDIENCE
The target audience for course 130112B includes public and private sector bridge inspectors, supervisors, project engineers, and others responsible for field inspection of in-service bridges. This will include personnel who may be engineers or technicians in positions such as bridge inspection program manager, bridge inspection project manager, bridge inspection team leader, bridge inspection team member, and FHWA Structural/Bridge Engineers.

TRAINING LEVEL: Basic

FEE: 2022: $50 Per Person; 2023: $0 Per Person

LENGTH: 5 HOURS (CEU: .5 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130112C

COURSE TITLE
NDE for Timber and Other Material Bridge Elements (Web-based)

130112C Nondestructive Evaluation (NDE) for Timber and other Material Bridge Elements explains the “why” behind the approaches with theoretical explanations of the techniques, comparative costs of each approach, and their applicability to timber and other bridge materials. This course is the third of three WBTs in the WBT Course Series, Practical Applications of Nondestructive Evaluation for Bridge Inspection, which also includes 130112A NDE for Concrete Bridge Elements and 130112B NDE for Steel Bridge Elements. This Course Series (130112A, 130112B, 130112C) is a follow up to introductory course 130111 providing a more in-depth study of NDE topics.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the application of NDE technology to decay and other voids of timber bridge elements
• Describe the application of NDE technology to delamination and cracks of FRP bridge elements

TARGET AUDIENCE
The target audience for course 130112C includes public and private sector bridge inspectors, supervisors, project engineers, and others responsible for field inspection of in-service bridges. This will include personnel who may be engineers or technicians in positions such as bridge inspection program manager, bridge inspection project manager, bridge inspection team leader, bridge inspection team member, and FHWA Structural/Bridge Engineers.

TRAINING LEVEL: Basic

FEE: 2022: $50 Per Person; 2023: $0 Per Person
LENGTH: 4 HOURS (CEU: .4 UNITS)
CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-130122

Course Title
Design and Evaluation of Bridges for Fatigue and Fracture

This two-day training course presents relevant issues related to fatigue and fracture in steel bridges, including analysis, design, evaluation, repair, and retrofit. It is based on the AASHTO LRFD Bridge Design Specifications, Eighth Edition, as well as the AASHTO Manual for Bridge Evaluation, Second Edition, with Interim Revisions through 2016. Participant Exercises, Guided Walk Throughs, and videos are included throughout the training to aid bridge engineers with the implementation of the presented information.

This course consists of three modules. The first module serves as a general introduction to the class. The second module covers fundamentals, and it includes four lessons - Introduction to Fatigue and Fracture, Crack Growth in Steel Structures, Theory, and Characterizing Fatigue and Fracture in Bridge Members. The third module covers application, and it includes five lessons - Analysis for Fatigue, AASHTO Design Approach for Fatigue, AASHTO Design Approach for Fracture, AASHTO Evaluation Approach, and Retrofit and Repair.

The curriculum materials include a comprehensive Reference Manual in CD format (FHWA Publication No. FHWA-NHI-16-016), lecture and workshop exercises intended to promote or enhance a working knowledge of AASHTO LRFD, and a participant workbook for lecture notes and exercises.

Individuals attending this course should have a minimum BSCE degree. They should also have a working knowledge of the current AASHTO LRFD Bridge Design Specifications and should have relevant design experience using this specification on at least one steel bridge superstructure.

There are no NHI prerequisites for this course. However, select topics of this course are also addressed in NHI Courses 130078 (Fracture Critical Inspection Techniques for Steel Bridges), 130081 (LRFD for Highway Bridge Superstructures), and 130095 (LRFD and Analysis of Curved Steel Highway Bridges).

Outcomes
Upon completion of the course, participants will be able to:

• Explain the fundamentals of fatigue and fracture on steel highway structures
• Identify the various analysis methods for determining fatigue and fracture considerations on steel highway structures
• Explain the various AASHTO methodologies as it pertains to fatigue and fracture design
• Identify the AASHTO methodology for fatigue and fracture evaluation
• Describe the various strategies for repair and retrofit of steel highway structures

Target Audience
The primary audience for this course includes State DOT Bridge and Structures Engineers and Practitioners responsible for steel bridge design and evaluation. The target audience includes engineers at all levels, including designers, consultants, reviewers, maintenance and management engineers, and load raters.

Training Level: Intermediate

Fee: 2022: $900 Per Person; 2023: $900 Per Person

Length: 2 DAYS (CEU: 1.3 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130124

COURSE TITLE
Tunnel Safety Inspection Refresher WBT Prerequisite

This web-based prerequisite training provides basic concepts with regards to tunnel inspection and safety prior to taking 130125 Tunnel Safety Inspection Refresher. This course (in addition to 130125 Tunnel Safety Inspection Refresher) comprises of a total of 18 hours, and must be completed every 5 years to satisfy regulatory requirements for tunnel inspection refresher training. With recurring refresher training, these courses help maintain the consistency of the tunnel inspection program. The course is based on the FHWA National Tunnel Inspection Standards (NTIS), the FHWA Tunnel Operations, Maintenance, Inspection and Evaluation (TOMIE) manual, and the FHWA Specifications for the National Tunnel Inventory (SNTI).

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the current overall condition and condition trends for the nation’s tunnels
• Describe the National Tunnel Inspection Standards (NTIS)
• Describe the FHWA’s “Tunnel Operations, Maintenance, Inspection and Evaluation (TOMIE) Manual”
• Describe the FHWA’s “Specifications for the National Tunnel Inventory (SNTI)”
• Identify keys to ensuring a safe work environment
• Identify tunnel inspection documentation methods
• Define a critical finding
• Identify National Tunnel Inventory (NTI) items
• Identify tunnel structural, civil, mechanical, electrical/lighting, signage, & fire/life safety/security elements

TARGET AUDIENCE
The target audience for the Tunnel Safety Inspection Refresher WBT is primarily members of Federal, State, local and Tribal highway agency employees, specifically program managers, tunnel owners, and tunnel inspectors. A secondary target audience may include maintainers, such as operations and maintenance staff, as well as designers, load rating engineers, and asset managers.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 4 HOURS (CEU: .4 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-130125

Course Title
Tunnel Safety Inspection Refresher ILT

This 2.5-day, Instructor-led Training (ILT) is highly interactive and builds upon participants' prior knowledge of bridge and/or tunnel inspection. This course covers the entire breadth of knowledge necessary to manage or execute a successful tunnel inspection. However, it does not replace the need for specialized experts to assist in inspections.

There are seven course modules. During the course, the instructor will lead participants through a series of case studies giving them an opportunity to practice and apply their knowledge in real-life tunnel inspection situations. The capstone case study comprises of a tunnel inspection exercise that takes place at the end of the course.

All participants must successfully complete the following prerequisite requirements prior to taking the FHWA-NHI-130125 course:

*130110 Tunnel Safety Inspection Training Course
*130124 Tunnel Safety Inspection Refresher Web-based Training

It is not required, but strongly recommended that participants possess some design or safety inspection experience of in-service bridges or tunnels.

Outcomes
Upon completion of the course, participants will be able to:

- Explain the importance and purpose of tunnel inspection
- Apply the fundamentals of tunnel inspection
- Demonstrate the inspection and evaluation of tunnel structural, civil, mechanical, electrical, signage, lighting, and fire/life safety/security elements
- Use tunnel inspection references

Target Audience
The target audience for the Tunnel Safety Inspection ILT course is primarily members of Federal, State, local (Authority or Commission) and Tribal highway agency employees, who are involved with tunnel design, inspection, and maintenance, as well as consultants involved in inspecting tunnels or in tunnel inspection management and leadership positions.

Training Level: Basic

Fee: 2022: $1000 Per Person; 2023: $1100 Per Person

Length: 2.5 DAYS (CEU: 1.7 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-130126

Course Title
Strut-and-Tie Modeling (STM) for Concrete Structures

The American Association of State Highway and Transportation Officials (AASHTO) recently adopted a new strut-and-tie modeling (STM) specification and is now strongly encouraging special analysis using such methods as STM. In response to the numerous requests for STM training from the bridge engineering community, as well as in response to this new STM specification, there is a strong need for developing training to address the uncertainties and produce a primary source of reference material for STM applications for bridge engineers.

STM provides engineers with a simplistic analysis and design tool for deep concrete bridge elements and disturbed regions that would otherwise require a rigorous refined analysis. STM has long been established as a reasonable analysis tool for disturbed regions and deep beams. However, this modeling tool has had difficulty being integrated into our bridge design state-of-practice, which has resulted in inappropriate use of the simplistic elastic beam theory design for deep beams and disturbed regions. In some cases, it has resulted in poor in-service performance. This training course serves as a significant step in providing the knowledge transfer necessary for STM to be used more frequently and more effectively.

Outcomes
Upon completion of the course, participants will be able to:

• Describe the fundamentals of STM, including its definition, theory, and historical background
• Explain the application of STM in bridge design, including identification of B-regions and D-regions and specific applications to bridge superstructures and substructures
• Describe the required procedures for STM model development and design
• Explain element-level considerations in STM, including struts, ties, and nodal zones
• Summarize serviceability considerations in STM, including crack control, shear stress check, and sizing of members to minimize diagonal cracking
• Explain the STM provisions presented in AASHTO LRFD
• Apply STM fundamentals and procedures through a comprehensive design example

Target Audience
The primary audience includes state DOT bridge and structures engineers and practicing bridge engineers who are responsible for concrete bridge design and evaluation. The target audience includes engineers of all levels, including designers, consultants, reviewers, maintenance engineers, management engineers, and load rating engineers. Pre-training Competencies: Individuals attending this course should have a Bachelor of Science degree in civil engineering. They should have a working knowledge of AASHTO LRFD, and they should have relevant design experience using the current AASHTO LRFD on at least one concrete bridge project.

Training Level: Basic

Fee: 2022: $970 Per Person; 2023: $970 Per Person

Length: 1.5 Days (CEU: 1.1 Units)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov

Web site: www.nhi.fhwa.dot.gov • E-mail: nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132012

Course Title
Soils and Foundations Workshop

This course is geared toward practicing design and construction engineers who routinely deal with soil and foundation problems but have little theoretical background in soil mechanics or foundation engineering. The course takes a project-oriented approach whereby the soils input to a bridge project is followed from conception to completion. In each phase of the project, the soil concepts will be developed into specific foundation designs and recommendations. The classroom presentation includes a variety of exercises to verify achievement of learning objectives. Each participant will take away a comprehensive reference manual on soils and foundations and a participant workbook containing a copy of all slides presented and completed exercises.

NOTE TO PARTICIPANT: All participants should bring calculators that perform trigonometric calculations, a note pad, and a pencil.

NOTE TO HOST: In addition to the typical host requirements of NHI courses, for this course the host is asked to arrange for the state’s geotechnical engineering group to conduct a short presentation (usually on the second day of the course) summarizing the administrative and technical procedures followed by the host state.

Outcomes

Upon completion of the course, participants will be able to:

- Identifying the minimum level of geotechnical input in various project phases of a highway project
- Recalling the equipment and procedures used to implement a subsurface investigation of soil and rock conditions
- Demonstrating basic skills in visual description of soils native to the host state
- Recalling geotechnical facilities and personnel in the host state
- Recalling the basic soil test procedures and how the results of the various soil tests are applied results to highway projects
- Listing procedures used for both settlement and stability analysis, and recalling design solutions to stability and settlement problems for approach roadway embankments
- Listing procedures used for determining bearing capacity and settlement of shallow foundations such as spread footings
- Identifying the basic skills needed in the design and construction management of driven pile and drilled shaft foundations
- Recalling the driven pile and drilled shaft foundation construction equipment and construction inspection procedures
- Description static load testing and recalling the basic skills needed to interpret static load test results
- Recalling the basic skills needed in the design and construction of earth retaining structures
- Discussing the format and minimum content of an adequate foundation report

Target Audience

Personnel from the following units at the transportation agency could benefit from this workshop: geotechnical, bridge design, roadway design, materials, construction, and maintenance. The personnel who will benefit the most are the first-line supervisors involved in the design of highway structures and embankments. The greatest impact will be achieved by convincing structural, design, and construction engineers to use procedures from this course as a guide for routine geotechnical work. All attendees should be encouraged to attend the entire course, not just sections that are in their specialty. One of the major benefits of this course is to give engineers an appreciation of activities outside their specialties that influence, or are influenced by, the work of the geotechnical engineer.
TRAINING LEVEL: Basic

FEE: 2022: $1100 Per Person; 2023: N/A

LENGTH: 4 DAYS (CEU: 2.4 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-132014

COURSE TITLE
Drilled Shafts

Drilled shafts are an alternate type of deep foundation that may be more cost effective and perform better than other types of deep foundations in bridge piers at river crossings and in retrofit operations, high-mast lighting, earth retaining structures, single-column piers, and similar applications. This course provides participants with specific technical guidance on all aspects of designing, installing, and monitoring the construction of drilled shafts. The lessons address the following topics: applications, advantages, and disadvantages of drilled shafts for transportation structure foundations; general requirements for subsurface investigations; construction methods; construction case histories; construction specifications; principles of designing drilled shafts for axial and lateral loading; expansive soils, downdrag, and similar effects; load testing; inspection; integrity testing; repair and retrofit of defective shafts; and cost estimation. The participants will receive a comprehensive reference manual on drilled shaft construction and design used by engineers who perform detailed designs of drilled shafts, write construction specifications, and evaluate the performance of contractors through a comprehensive inspection program.

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe the various drilling rigs and tools that are available to construct drilled shafts under varied subsurface soil and rock conditions
• Recognize the basic features of drilling aids, such as casings and drilling slurries, and the reasons for certain fundamental requirements for these aids
• Design drilled shafts for axial loading in simple soil and rock profiles
• Demonstrate a general understanding of the elements of designing drilled shafts for lateral loads
• Demonstrate an understanding of the need for load tests and available methods for performing the tests
• Formulate the basic elements of construction specifications for drilled shafts
• Demonstrate an understanding of integrity testing, repair, and retrofit of defective shafts
• Estimate costs for drilled shafts

TARGET AUDIENCE
The target audience for this course includes geotechnical engineers, bridge designers, and resident engineers. The course embraces both construction and design, and it is important that all participants attend all lessons, not just those in their immediate areas of interest. A key issue is how the details of construction affect the way in which a drilled shaft should be designed and how the intent of the design affects inspection. Participants are expected to have a degree in engineering for which they have passed an undergraduate course in soil mechanics and/or have successfully completed NHI course FHWA-NHI-132012 Soils and Foundations Workshop.

TRAINING LEVEL: Intermediate

FEE: 2022: $950 Per Person; 2023: $980 Per Person
LENGTH: 3 DAYS (CEU: 1.6 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132036

Course Title
Earth Retaining Structures

The goal of this course is to provide agencies with state-of-the-practice design tools and construction techniques to expand implementation of safe and cost-effective earth retention technologies. This course addresses the selection, design, construction, and performance of earth retaining structures used for support of fills and excavations or cut slopes. Instructors cover factors that affect wall selection, including contracting approaches with an emphasis on required bidding documents for each approach. Class discussions will include design procedures and case histories, demonstrating the selection, design, and performance of various earth retaining structures. Detailed information on subsurface investigation, soil and rock property design parameter selection, lateral earth pressures for wall system design, and load and resistance factor design (LRFD) for retaining walls are provided.

Outcomes
Upon completion of the course, participants will be able to:

- Describe potential applications for Earth Retaining Structures (ERS)
- Select a technically appropriate and cost-effective ERS
- Select appropriate material properties, soil design parameters, and earth pressure diagrams
- Perform design analysis and prepare conceptual designs
- Review contractor submitted documents
- Discuss contracting methods
- Describe construction and inspection activities for ERS

Target Audience
The primary audience for this course is agency and consultant bridge/structures, geotechnical, and roadway design engineers; engineering geologists; and consultant review specialists. In addition, management, specification, and contracting specialists and construction engineers involved in design and contracting aspects of retaining structures are encouraged to attend. Attendees should have a basic knowledge of soil mechanics and structural engineering, including some understanding of LRFD concepts.

Training Level: Intermediate

Fee: 2022: $950 Per Person; 2023: $950 Per Person

Length: 3 DAYS (CEU: 1.8 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov

Web site: www.nhi.fhwa.dot.gov • E-mail: nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132040

Course Title
Geotechnical Aspects of Pavements

This course covers the latest methods and procedures to address the geotechnical issues in pavement design, construction, and performance for new construction, reconstruction, and rehabilitation pavement projects. The course content includes geotechnical exploration and characterization of in-place and constructed subgrades; design and construction of subgrades and unbound layers for paved and unpaved roads, with emphasis on the American Association of State Highway Transportation Officials (AASHTO) 1993 empirical design procedure and on the new Mechanistic-Empirical Pavement Design Guide (MEPDG); drainage of bases, subbases, and subgrades and its impact on providing safe, cost-effective, and durable pavements; problematic soils, soil improvement, stabilization, and other detailed geotechnical issues in pavement design and construction; and construction methods, specifications, and QC/QA (quality control/quality assurance) inspection for pavement projects.

The goal of the course is for each participant to recognize the importance of the geotechnical aspects relevant to the design, construction, and performance of a pavement system. Participants will develop an appreciation for the importance of adequate subsurface exploration and laboratory characterization of subgrade soils as well as the requisite pavement design parameters for subgrades, unbound base and subbase layers, including drainage features. The course is designed to elicit maximum input from participants, particularly regarding an understanding of the impact of geotechnical features on the long-term performance of pavement systems.

NOTE TO PARTICIPANT: Please bring a calculator that can perform trigonometric, log, and other engineering calculations, a note pad, and a pencil.

NOTE TO HOST: For this course, the host is asked to identify a state speaker to conduct a host state presentation. The presentation is usually on the first day of the class and lasts approximately 25 minutes with an additional 15 minutes of discussion. The objective of the presentation is to communicate the state’s current practices and experience to the course participants. The state representative should have experience in geotechnical pavement activities. A detailed list of issues to be addressed in the host presentation will be provided. Also for this course, the host is asked to secure at least 6 laptop computers to be used during team exercises. The host can request that at least 6 participants bring their laptops to the course. The machines must have Microsoft Excel (Office 97 or later) and the optional Solver add-in tool installed. Lastly, the host state is asked to complete a “Questionnaire on Geotechnical Practices in Pavement Design” and provide policies and special provisions for (1.) obtaining subsurface information and laboratory testing in relation to pavement design, (2.) pavement design along with any agency design guides, (3.) field construction monitoring for subgrade approval and pavement component approval as well as contractors QC requirements for pavement component construction.

Outcomes

Upon completion of the course, participants will be able to:

• Explain the geotechnical parameters of interest in pavement design and their effects on the performance of different types of pavements
• Explain the influence of climate, moisture, and drainage on pavement performance
• Identify and explain the impact of unsuitable subgrades on pavement performance
• Determine the geotechnical inputs needed for design of pavements, both for the AASHTO 93 empirical design procedure and the new MEPDG
• Evaluate and select appropriate remediation measures for pavement subgrades
• Explain the geotechnical aspects of construction specifications and inspection requirements
• Identify subgrade problems during construction and develop recommended solutions

Target Audience

Many groups within an agency are involved with different aspects of definition, design, use, and construction verification of pavement geomaterials. These groups include pavement design engineers, geotechnical engineers, materials engineers, specification writers, and construction engineers who are or will be involved in the design, evaluation, and construction (or reconstruction or rehabilitation) of pavements. This course was developed as a forum for these various personnel to work together to enhance current procedures for building and maintaining more cost-efficient pavement...
structures.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $950 Per Person; 2023: $950 Per Person

**LENGTH:** 3 DAYS (CEU: 1.8 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Course Title
Design of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes

Mechanically stabilized earth walls (MSEWs) are commonly used on roadway projects and are typically cost effective and aesthetically pleasing. The basic concept behind MSEWs is to combine soil, reinforcing materials made of steel or polymers, and appropriate facing to produce a composite system with engineering properties that are ideal for most roadway applications. Reinforced soil slopes (RSS) utilize the same types of reinforcement for the construction of steep embankments. Both MSEWs and RSS structures can provide substantial savings in construction time and costs when compared with other types of earth retaining systems.

The goal of the course is to educate agencies about state-of-the-practice design tools. This includes comprehensive instruction on the design of MSEWs using load resistance factor design (LRFD). The course also presents construction practices to promote implementation of mechanically stabilized earth technology in cost effective earth retention structures. This course would most benefit persons who are involved in the design and construction of earth retention structures for surface transportation projects.

NOTE TO PARTICIPANT: Please bring a calculator that performs trigonometric calculations, a note pad, and a pencil.

NOTE TO HOST: In addition to the typical host requirements of NHI courses, for this course the host state technical contact is asked to bring 30 copies of the standard MSE wall and the RSS specifications (or special provisions), a complete set of applicable state DOT state construction specifications, standard plates, standard details, inspection guidelines, etc. pertaining to earth retaining structures. Copies should be forwarded to the instructors a month before the course. The host agency is also asked to provide approximately 20-25 pounds of dry sand. About 1/2 bag of “play” sand from a hardware store will suffice.

Outcomes
Upon completion of the course, participants will be able to:

• Recognize potential applications for MSEWs and RSS structures in transportation facilities
• Prepare conceptual and basic (i.e., for simple geometry) designs, and be able to check contractor-submitted designs for walls and slopes
• Examine and select appropriate material properties and parameters used in design
• Calculate the cost of conceptual MSEWs and RSS structures and determine if construction is a cost-effective option
• Select appropriate specification/contracting method(s) and prepare detailed specifications for materials and methods of construction
• Define and communicate major components of construction inspection of MSEWs and RSS structures to confirm compliance with design

Target Audience
The primary audience for this course is agency and consultant bridge/structures, geotechnical, and roadway design engineers; engineering geologists; and consultant review specialists. In addition, management, specification and contracting specialists, and construction engineers interested in design and contracting aspects of MSEWs and RSS structures are encouraged to attend. Attendees should have a basic knowledge of soil mechanics and structural engineering. (Note that NHI offers a 1-day course, FHWA-NHI-132043 Construction of MSEW and RSS.)

Training Level: Intermediate

Fee: 2022: $950 Per Person; 2023: $1050 Per Person
Length: 3 DAYS (CEU: 1.8 UNITS)
Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-132078

COURSE TITLE
Micropile Design and Construction

The primary goal of this course is to provide the target audience with guidance on when and where it is appropriate to use micropiles, and educate engineers about the state of the practice in the design and construction of micropiles. The course covers stepwise procedures for the design of micropiles for structural support and for slope stability applications. Construction, inspection and integrity-testing aspects and issues are discussed as well. Classroom presentations include exercises that will lead participants through the technical and cost feasibility aspects of structural support and slope stability design with micropiles. Each participant will receive a workbook and reference manual containing detailed micropile design examples for various applications.

FHWA-NHI-132012 Soils and Foundations course is a recommended prerequisite.

OUTCOMES
Upon completion of the course, participants will be able to:
• Briefly describe the history and current status of the micropile industry
• Identify potential micropile applications
• Explain construction constraints, techniques, and performance
• Assess feasibility of micropiles for a given application
• Prepare conceptual and basic designs, and evaluate contractor-submitted designs
• Select appropriate specification/contracting method(s) and prepare contract documents
• Describe construction monitoring and inspection requirements

TARGET AUDIENCE
This course is directed toward practicing geotechnical, foundation, construction and bridge/structural engineers who have knowledge and experience in the design and construction of driven piles and drilled shaft foundations. Engineers involved with the design and construction of structure foundations will all benefit from this training, which builds upon the basic concepts presented in NHI courses FHWA-NHI-132012, FHWA-NHI-132014, and FHWA-NHI-132021.

TRAINING LEVEL: Intermediate

FEE: 2022: $750 Per Person; 2023: $750 Per Person
LENGTH: 2 DAYS (CEU: 1.2 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
The use of recycled materials in asphalt pavement construction is supported by the Federal Highway Administration (FHWA) and other transportation organizations for a number of reasons. First, recycling asphalt pavements is often more cost-effective than more traditional rehabilitation and reconstruction alternatives, which is important in today’s economic climate. Second, when designed and constructed effectively, these pavements perform well under a range of traffic levels and environmental conditions. Finally, recycling provides sustainable, environmental benefits, e.g., a reduced carbon footprint, the preservation of natural resources, and the reuse of high-quality aggregates contained within the existing pavement.

Transportation agencies focusing on the use of sustainable, cost-effective, and environmentally friendly construction practices must consider recycling techniques as a viable alternative to the more traditional rehabilitation techniques used on asphalt-surfaced pavements. However, increased guidance is needed on selecting the appropriate recycling technique for a given set of conditions, choosing the appropriate materials for the project, developing suitable specifications, and constructing those projects effectively. This course presents the current technology available in the asphalt pavement recycling area and provides the guidance necessary for transportation agencies to use and construct those techniques effectively.

The course is taught as a 2-day instructor-led training course focusing on project and technique selection and justification, material considerations and design, construction specifications, and project control considerations during construction.

There is also a web-based training (WBT) independent study that serves as a prerequisite to the instructor-led course. It takes approximately 1.5-hours to complete. The WBT introduces the pavement evaluation techniques commonly used to determine the cause and extent of pavement deterioration present in a pavement section that is a candidate for asphalt recycling. The material introduces common asphalt pavement distress types and identifies methods of assessing pavement condition, i.e., pavement condition surveys, nondestructive testing, and coring. The WBT also introduces the three recycling techniques listed below and the types of equipment commonly used for each process.

- Hot in-place recycling (HIR)
- Cold recycling (CR)
- Full depth reclamation (FDR)

The material also discusses the use of cold milling on in-place recycling projects.

**Outcomes**

Upon completion of the course, participants will be able to:

- Describe the economic, environmental, and engineered performance benefits associated with using recycling.
- Identify the key factors that contribute to the selection of appropriate asphalt recycling techniques under different traffic levels, pavement conditions, and environments.
- Identify the key requirements in developing effective recycling construction specifications including method specification, warranty, and end result or performance specifications.
- Demonstrate the ability to select the appropriate new materials, e.g., binders and aggregates, and additives needed for each of the three asphalt recycling techniques.
- List steps that can be taken to address a variety of issues that may impact the constructability of a project.
- Each lesson has enabling learning outcomes that support each terminal learning outcome.

**Target Audience**

This course is designed for state and local transportation agency engineers, e.g., pavement managers and maintenance engineers, and other agency personnel who are responsible for selecting, designing, or constructing the agency’s asphalt pavement maintenance, resurfacing, rehabilitation, and reconstruction alternatives. The course will particularly benefit individuals responsible for selecting and designing asphalt recycling projects, for writing effective specifications, or for inspecting asphalt recycling projects during their construction. Contractors, consulting engineers, and industry representatives involved in asphalt pavement recycling will also benefit from the course.
TRAINING LEVEL: Intermediate

FEE: 2022: $200 Per Person; 2023: $230 Per Person

LENGTH: 2 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
(Introduction to) Asphalt Pavement In-Place Recycling Techniques

This training is a prerequisite of another NHI training and is offered at no cost.

Transportation agencies focusing on the use of sustainable, cost-effective, and environmentally conscious construction practices often consider in-place recycling techniques as a viable alternative to the more traditional rehabilitation techniques used on asphalt-surfaced pavements. NHI training 131050 Asphalt Pavement In-place Recycling Techniques is designed to help participants acquire necessary skills for selecting the appropriate in-place recycling technique for a given set of conditions, choosing the appropriate materials for the project, developing suitable specifications, and constructing those projects effectively.

The Asphalt Pavement In-place Recycling Techniques course includes two brief Web-based training (WBT) modules, and two days of instructor-led, classroom-based training (ILT). Through independent study, classroom interaction, and workshop activities, participants explore the current technologies available in the area of asphalt pavement in-place recycling. Two WBT lessons introduce pavement evaluation techniques and the three potential recycling techniques, along with the types of equipment commonly used for each. The classroom session focuses on project and technique selection and justification, materials considerations and mix design, construction specifications, and project control considerations during construction.

OUTCOMES

Upon completion of the course, participants will be able to:

- Describe the economic, environmental, and engineered performance benefits associated with using in-place asphalt recycling
- Identify the key factors that contribute to the selection of appropriate in-place asphalt recycling techniques under different traffic levels, pavement conditions, and environments
- Identify the key requirements in developing effective in-place asphalt recycling construction specifications, including method specification and end-result or performance specifications
- Demonstrate the ability to select the appropriate new materials and additives needed for each of three HMA pavement in-place recycling techniques
- List steps that can be taken to address a variety of issues that may impact the constructability of a project

TARGET AUDIENCE

This course is intended for State and local transportation agency engineers, such as pavement managers and maintenance engineers, and other agency personnel who are responsible for selecting, designing, or constructing the agency’s asphalt pavement maintenance, resurfacing, rehabilitation, and reconstruction alternatives. The course particularly benefits those individuals responsible for selecting and designing asphalt in-place recycling projects, for writing effective specifications, or for inspecting asphalt in-place recycling projects during their construction. Contractors, consulting engineers, and industry representatives involved in asphalt pavement in-place recycling also will benefit from this course.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 2 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131100

Course Title
Pavement Smoothness: Use of Inertial Profiler Measurements for Construction Quality Control

Studies have shown that roughness is one of the biggest priorities of highway users. Additional studies have shown that pavements that are built smooth stay smoother longer and provide a longer pavement life. Most State highway agencies (SHAs) have some type of smoothness specification that is used to evaluate the smoothness of newly constructed or rehabilitated pavements during acceptance testing. Many agencies also have incentives or disincentives for new construction and rehabilitation, which are based on pavement smoothness.

Increasingly these agencies are turning to inertial profilers as the most reliable instrument for construction acceptance testing and verifying pavement smoothness. The intent of this course is to train inertial profiler operators in the basics of performing construction acceptance testing and to train those reviewing the data to comprehend how those data were obtained and what they represent in order to build smoother riding roadways.

The course has been developed to be delivered in a single day of instructor-led training. In order to keep the instructor-led portion of the training to a single day, the training includes two hours of independent study that should be completed prior to attending the instructor-led session.

Outcomes
Upon completion of the course, participants will be able to:

• Perform checks of the inertial profiler components to identify that the equipment is in proper working order.
• Determine the impact of current surface and environmental conditions on data collection.
• Collect profile data using appropriate operating techniques.
• Calculate a smoothness index using appropriate data processing techniques and computational procedures for use in construction quality control and specification compliance.
• Identify what features in a collected profile are manifested in a smoothness or roughness index.

Target Audience
The course was designed for an audience directly involved in the use of inertial profilers and the application of the data obtained from inertial profilers. This includes State and contractor road profiler operators who perform data collection, initial processing, and reporting of smoothness data. Paving superintendents, project engineers, pavement engineers, and inspectors who are performing data analysis, quality control, and acceptance will also benefit from this course. Ideally, each session of the course will include a mixture of State and contractor personnel, including those who collect data, those performing data processing, and those making decisions based upon data.

Training Level: Intermediate

Fee: 2022: $150 Per Person; 2023: $150 Per Person

Length: 1 DAYS (CEU: .6 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131116

Course Title
Pavement Management Fundamentals WBT

Pavement Management Fundamentals is a self-paced training that describes the basic principles and structure of a pavement management program. Specifically, the course describes the purpose of pavement management, its core components, and the critical role pavement management plays supporting other highway transportation agency functions and programs, such as planning and programming, pavement design, and asset management.

The intent of this course is not to explain how core pavement management functions are conducted. Instead, it is to explain what the functions are, the inputs upon which they rely, and the value they provide to both pavement management and other agency business processes and programs.

Outcomes
Upon completion of the course, participants will be able to:

• Describe an effective pavement management program and the value it provides to the agency.
• Describe the critical role of data and data collection in a pavement management program.
• Explain the impact of quality and quality management in a pavement management program.
• Explain how to manage pavement data so it can be used effectively.
• Describe the activities involved in setting up PMS analyses.
• Describe how PMS products are used to support agency planning and programming decisions.
• Describe effective pavement management reporting processes.

Target Audience
The course targets practitioners who manage roadways and highways with little to no experience in pavement management or those interested in refreshing their knowledge about pavement management programs or systems. This may include people assigned pavement management duties, such as Data Collectors, Data Analysts, and Pavement Managers, and those using pavement management information to complete tasks, such as Transportation Asset Management, Maintenance, Planning, or Design personnel from federal, state, local, and tribal agencies. In addition, roadway or highway agency administrators and leaders may complete the first module, Introduction to Pavement Management Concepts, to familiarize themselves with the role pavement management fills in a transportation agency.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 3 HOURS (CEU: .3 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131117

Course Title
Basic Materials for Highway and Structure Construction and Maintenance

This training is provided by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to review basic materials for highway and structure construction and maintenance. The training was prepared by State DOT personnel for State DOT personnel. It contains good practices from various agencies. Each State agency/company has its own specifications, which the viewer needs to review and follow. This course is primarily intended for inspectors and technicians.

Although there are a number of materials used in the construction and maintenance process for both highways and structures, this course is focused on the three basic materials. They are Aggregate, Portland Cement Concrete (referred to as PCC), and Hot Mix Asphalt (referred to as HMA).

This training is directed toward entry level technicians, to give them a general view of the basic materials used in construction and maintenance. The course modules will address the procedures used in the production and sampling of aggregates.

Module 1 is called Basic Aggregates and includes quarry inspection, sand operation, stockpiling, and sampling. Module 2 covers Portland Cement, including the production of Portland Cement, the hydration process, as well as other cementing materials used in concrete such as water, admixtures, and aggregates. Module 3 reviews Hot Mix Asphalt, including the asphalt binder and aggregates used in the production.

Outcomes
Upon completion of the course, participants will be able to:

- Identify aggregate production and sampling procedures
- Recognize the ingredients of PCC and the part each plays in concrete production
- Recognize the ingredients of HMA and the part each plays in hot mix asphalt production

Target Audience
This training is designed for Level I and Level II State/local public agency personnel and their industry counterparts involved in the construction, maintenance and testing process for highways and structures. Level I or Entry refers to employees/trainees with little to no experience in the subject area and perform his/her activities under direct supervision. Level II or Intermediate refers to employees that understand and demonstrate skills in one or more areas of the entry level and perform specific tasks under general supervision.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 3 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131121

Course Title
Construction of Portland Cement Concrete Pavements

Improving and maintaining the quality of concrete is an important aspect of keeping pavements safe and long lasting. This training provides participants with an overview of the entire Portland cement concrete (PCC) paving and restoration process: setting forms, mixing, hauling, curing and applicable repair techniques. This training is presented in several modules:

1. Construction Quality
2. PCC Production Overview
3. Slipform Paving
4. Fixed Form Paving
5. Pavement Curing, Sawing, and Joint Sealing Operations
6. Concrete Pavement Restoration

This self-paced, Web-based training is designed for participants to progress at their own pace. The training focuses on the proper methods for construction of concrete paving and pavement restoration techniques with an emphasis on cause and effect.

Outcomes
Upon completion of the course, participants will be able to:

• Describe the differences between truck-mixed and ready-mixed concrete
• Identify factors in production and paving operations that contribute to achieving a smooth ride
• Describe the differences between slip-form and fixed-form paving
• Identify the factors that impact saw timing and crack control
• Recognize the importance and key factors in placing joint sealant materials
• Identify the components of concrete pavement restoration application and construction techniques
• Describe the purpose and appropriate use of full depth and partial depth repairs
• Identify critical factors for curing and sawing operations that affect pavement performance
• Describe the purpose of grinding and dowel bar retrofit
• Identify applicable repair techniques for concrete pavement restoration
• Describe purpose of slab stabilization and joint and crack resealing

Target Audience
This training is designed for contractors, technicians, and inspectors who are involved in daily pavement operations for the placement and restoration of PCC pavements. Participants should have some working knowledge of concrete pavement construction.

Training Level: Intermediate

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 10 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131122

Course Title
Portland Cement Concrete Paving Inspection

This training is provided by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to review inspection practices for Portland cement concrete paving projects. The training was originally developed by the Iowa Department of Transportation and more currently updated and reviewed by the TCCC and NHI. This course is recommended for the Transportation Curriculum Coordination Council levels I and II. This course is primarily intended for inspectors and technicians.

This training course has been prepared to provide guidance and instruction to inspectors involved in the construction of Portland cement concrete (PCC) pavements. The important tasks involved in this work are explained and proper procedures are described. The material is targeted for those who have not had experience in PCC paving construction.

Outcomes
Upon completion of the course, participants will be able to:

- Identify the materials in a PCC mixture and the concrete properties
- Comprehend Design Project Plans and recognize the joints types and saw cuts
- Identify the safety requirements and recognize safe Traffic Control practices
- Recognize and comprehend the use of the equipment in a PCC Paving project
- Recognize various sub grade treatments
- Inspect project tasks for compliance with pre-paving requirements, i.e., survey stakes, proof rolling, subgrade, and dowel baskets
- Inspect project tasks for compliance with PCC Paving requirements, i.e., string line, place and consolidate, finish, and texture
- Perform post-construction checks

Target Audience
This training is designed for FHWA, State, and local agencies and their industry counterparts involved in the process of placement and inspection of Portland cement concrete paving. It is applicable to anyone desiring a better understanding of activities and inspection procedures on Portland cement concrete paving projects.

Training Level: Intermediate

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 5 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-131126A

COURSE TITLE
Concrete Pavement Preservation Series: Pavement Preservation Concepts

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module discusses how preventative maintenance impacts pavement preservation, good candidates for preservation, and the benefits to pavement preservation.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:

- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

OUTCOMES

Upon completion of the course, participants will be able to:

• Define pavement preservation and preventive maintenance
• Describe characteristics of suitable pavements for preventive maintenance
• Describe the importance of selecting and placing the “right” treatment and placing it at the “right” time
• List the benefits of pavement preservation

TARGET AUDIENCE

The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
Training Level: Intermediate

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 1 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131126B

Course Title
Concrete Pavement Preservation Series: Concrete Pavement Evaluation

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was sponsored by the FHWA and developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module discusses how preventative maintenance impacts pavement preservation, good candidates for preservation, and the benefits to pavement preservation. This module also describes the common procedures associated with conducting thorough pavement evaluations.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:

- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

Outcomes
Upon completion of the course, participants will be able to:

- Describe the need for a thorough pavement evaluation
- Name the common pavement evaluation components
- Describe what information is obtained from each pavement evaluation component

Target Audience
The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 2 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-131126C

COURSE TITLE
Concrete Pavement Preservation Series: Slab Stabilization

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module covers the use of slab stabilization (also known as undersealing) and slab jacking of concrete pavements. Slab stabilization restores support beneath slabs where voids have been detected, and slab jacking is used to raise depressed or settled slabs.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:
- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

OUTCOMES
Upon completion of the course, participants will be able to:
• List benefits of slab stabilization and slab jacking
• Describe recommended materials and mixtures
• Describe recommended construction steps for both procedures
• Identify typical construction problems and remedies for slab stabilization

TARGET AUDIENCE
The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131126D

Course Title
Concrete Pavement Preservation Series: Partial-depth Repairs

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module covers the procedures for partial-depth repairs (PDR) on PCC pavements. PDR is the removal and replacement of small, shallow areas of deteriorated PCC at spalled or distressed joints.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:

- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

Outcomes

Upon completion of the course, participants will be able to:

- List benefits and appropriateness of partial-depth repairs
- List the advantages and disadvantages of different available repair materials
- Describe recommended construction procedures
- Identify typical construction problems and appropriate remedies

Target Audience

The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
**Training Level:** Intermediate

**Fee:** 2022: $0 Per Person; 2023: $0 Per Person

**Length:** 1 Hours (CEU: 0 Units)

**Class Size:** Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-131126F

COURSE TITLE
Concrete Pavement Preservation Series: Retrofitted Edge Drains

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module presents design and construction information on retrofitted edge drains. This treatment is not as widely used as it once was, largely because it has limited applicability. Specifically, it must be targeted to those pavements that are 1) in good structural condition and 2) have bases with some degree of permeability that would allow water to be drained from beneath the pavement and to the edge drain.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:

- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

OUTCOMES
Upon completion of the course, participants will be able to:
• List benefits of drainage
• List components of edge drain systems
• Describe recommended installation procedures
• Identify typical construction problems and remedies

TARGET AUDIENCE
The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
**Training Level:** Intermediate

**Fee:** 2022: $25 Per Person; 2023: $0 Per Person

**Length:** 1 HOURS (CEU: 0 UNITS)

**Class Size:** Minimum: 1; Maximum: 1

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131126G

Course Title
Concrete Pavement Preservation Series: Dowel Bar Retrofit

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module presents design and construction information on load transfer restoration (LTR), sometimes referred to as retrofitted load transfer. In the introduction we will describe the difference between load transfer restoration (generic term) and dowel bar retrofitting (DBR) which is a specific means of achieving LTR. There are other methods available, but DBR is the most proven.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:
- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

Outcomes
Upon completion of the course, participants will be able to:
- List benefits and applications of load transfer restoration
- Describe recommended materials and mixtures
- Describe recommended construction procedures
- Identify typical construction problems and remedies

Target Audience
The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
Training Level: Intermediate

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 1 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131126H

Course Title
Concrete Pavement Preservation Series: Diamond Grinding and Grooving

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module describes recommended procedures for surface restoration of Portland cement concrete (PCC) pavements, specifically diamond grinding and diamond grooving operations.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:
- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

Outcomes
Upon completion of the course, participants will be able to:
- Differentiate between diamond grinding and diamond grooving and list the benefits of each
- Identify appropriate blade spacing dimensions for grinding and grooving
- Describe recommended construction procedures
- Identify typical construction problems and remedies

Target Audience
The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-131126I

COURSE TITLE
Concrete Pavement Preservation Series: Joint Sealing and Crack Resealing

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module covers joint resealing and crack sealing for concrete pavements. Joint resealing and crack sealing is defined as placement of an approved sealant material in an existing joint or crack to reduce moisture infiltration and prevent intrusion of incompressibles.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:
- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

OUTCOMES
Upon completion of the course, participants will be able to:
• List the benefits of joint resealing
• Describe desirable sealant properties and characteristics
• Describe recommended installation procedures
• Identify typical construction problems and appropriate remedies

TARGET AUDIENCE
The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131126J

Course Title
Concrete Pavement Preservation Series: Concrete Overlays

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module provides guidance on the selection of concrete pavement preservation strategies. Based on a collective review of a number of recent published documents, this module covers the seven step process that can be used to determine the most appropriate treatment (or combination of treatments) for a PCC pavement.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:

- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

Outcomes
Upon completion of the course, participants will be able to:

• Describe the treatment selection process
• List the components of a life-cycle cost analysis
• List other factors that may enter the selection process

Target Audience
The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-131126K

COURSE TITLE
Concrete Pavement Preservation Series: Strategy Selection

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module provides guidance on the selection of concrete pavement preservation strategies. Based on a collective review of a number of recent published documents, this module covers the seven step process that can be used to determine the most appropriate treatment (or combination of treatments) for a PCC pavement.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:
- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the treatment selection process
• List factors that might enter into the selection process
• Describe pavement deficiencies addressed by the different preservation treatments
• Describe how the benefits and costs of alternative treatment strategies are computed in a cost-effectiveness analysis
• Describe a process used to select the preferred treatment strategy

TARGET AUDIENCE
The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
**Training Level:** Intermediate

**Fee:** 2022: $25 Per Person; 2023: $0 Per Person

**Length:** .3 Hours (CEU: 0 Units)

**Class Size:** Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131127

Course Title
Concrete Series

The Transportation Curriculum Coordination Council (TCCC) in partnership with NHI is pleased to offer this comprehensive training series (FHWA-NHI-131127) for any engineer or supervisor working with Portland cement. The series is part of a curriculum from the “Integrated Materials and Construction Practices for Concrete Pavement” manual developed through the National Concrete Pavement Technology Center at Iowa State University.

This course is recommended for the Transportation Curriculum Coordination Council levels II - IV.

To streamline registration and enable you to take some or all of these courses when it best suits your schedule, we have created this new series option which automatically registers you for all 11 modules—it's that easy. They are as follows:

Module 1 - TCCC Design of Pavement (FHWA-NHI-134101)
Module 2 - TCCC Fundamentals of Materials Used for Concrete Pavements (FHWA-NHI-134084)
Module 3 - TCCC Mix Design Principles (FHWA-NHI-134087)
Module 4 - TCCC Fresh Concrete Properties (FHWA-NHI-134097)
Module 5 - TCCC Basics of Cement Hydration (FHWA-NHI-134096)
Module 6 - TCCC Incompatibility in Concrete Pavement Systems (FHWA-NHI-134085)
Module 7 - TCCC Early Age Cracking (FHWA-NHI-134095)
Module 8 - TCCC Hardened Concrete Properties- Durability (FHWA-NHI-134075)
Module 9 - TCCC Construction of Concrete Pavements (FHWA-NHI-134098)
Module 10 - TCCC QCQA for Concrete Pavements (FHWA-NHI-134100)
Module 11 - TCCC Troubleshooting for Concrete Pavements (FHWA-NHI-134102)

Outcomes
Upon completion of the course, participants will be able to:

- Explain concrete pavement construction as a complex, integrated system involving several discrete practices that interrelate and affect one another in various ways
- Recognize and implement technologies, tests, and best practices to identify materials, concrete properties, and construction practices that are known to optimize concrete performance
- Identify factors that lead to premature distress in concrete, and learn how to avoid or reduce those factors
- Apply appropriate how-to and troubleshooting information

Target Audience
This training is intended as both a training tool and a reference to help concrete paving engineers, quality control personnel, specifiers, contractors, suppliers, technicians, and tradespeople bridge the gap between recent research and practice regarding optimizing the performance of concrete for pavements.

Training Level: Intermediate

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 12 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-131129

COURSE TITLE
HMA Paving Field Inspection

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance and instruction to inspectors involved in the construction of hot mix asphalt (HMA) pavements. The important tasks involved in this work are explained and proper procedures are described. This training is recommended for the Transportation Curriculum Coordination Council levels I, II, and III. This course is primarily intended for inspectors and technicians.

This training is arranged in a fashion to help the inspector first learn the various aspects of what is involved in a HMA paving operation and then become familiar with the duties that are a part of the HMA pavement grade inspection responsibilities. It also explains how to recognize the mix properties of a HMA mixture. The information included will assist the inspector in recognizing problems during a project and offering solutions to the problems. This training is not intended to cover every aspect of HMA paving.

OUTCOMES
Upon completion of the course, participants will be able to:
• Know various aspects of what is involved in a HMA paving operation
• Understand the duties of a HMA paving inspector
• Recognize the mix properties of a HMA mixture
• Recognize the problems that may occur on HMA paving projects
• Understand the product and project so solutions can be recommended

TARGET AUDIENCE
This training would be beneficial to anyone that is involved with an HMA paving project, but focuses on technicians/inspectors that are involved with the production, placement, and inspection of HMA paving projects.

TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 4.5 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-131135

COURSE TITLE
Aggregate Sampling Basics

The Aggregate Sampling Basics course will cover the importance of proper sampling, why we need to sample aggregate, and why we need special procedures to do so. We will cover how to obtain a proper sample that will accurately represent the materials by utilizing sampling principles and preferred methods.

The specifications covered in the course are from the American Association of State Highway and Transportation Officials or AASHTO. The course starts at the beginning with what are aggregates, what are aggregate uses, and continues through proper sampling. It also has information on aggregate processing and sieving. The course contains interaction with the student and quizzes to make sure the material was understood.

OUTCOMES
Upon completion of the course, participants will be able to:
• Define aggregates
• Describe aggregate processing
• Describe aggregate sampling

TARGET AUDIENCE
This training is targeted to the beginning technician that will be obtaining aggregate samples for testing during production or on a project for agency, industry or consultant. This training is recommended for the Transportation Curriculum Coordination Council levels I and II.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person
LENGTH: 1 HOURS (CEU: 0 UNITS)
CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131137

Course Title
Special Mixture Design Considerations and Methods for Warm Mix Asphalt

Highway transportation agencies are exploring the use of warm mix asphalt (WMA) for pavement projects. Because of the potential environmental and engineering benefits that WMA provides, agency and industry personnel want to learn the proper design considerations for a quality WMA mixture design. Mixture design technicians and engineers are particularly interested in design differences between WMA and HMA.

The Special Mixture Design Considerations and Methods for Warm Mix Asphalt course explains the key differences between WMA and HMA design procedures. Participants in this course compare important elements of the mixtures and review the effects of those elements on the final WMA product. Learners also have an opportunity to apply AASHTO R35 standard practice to a WMA design modification, converting an HMA mixture design to WMA.

Outcomes
Upon completion of the course, participants will be able to:

• Describe differences between warm mix asphalt (WMA) and hot mix asphalt (HMA) mixture design processes.
• Convert HMA mixtures to WMA mixtures.

Target Audience
This training was developed for experienced HMA mixture design technicians and engineers who are interested in using WMA. Participants should have basic computer skills, such as manipulating windows, using directories, and opening Web browsers.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 2 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131139

Course Title
Constructing and Inspecting Asphalt Paving Projects

The goal of this course is to prepare participants to ensure asphalt pavement construction projects conform to quality and technical specifications. The course materials introduce asphalt pavement construction best practices, from the importance of understanding project administration roles and responsibilities to the most vital elements of laydown operations and compaction.

Participants learn construction management responsibilities; recognize proper construction practices; identify construction issues and their source; determine the impact of construction issues on performance; and select communication strategies for contractors, consultants, and superiors. They can then apply the knowledge and skills to maximize quality on construction projects.

The course emphasizes the importance of a proactive approach to managing and inspecting construction projects at every stage. This includes quickly addressing problems, implementing corrective actions, and documenting communications between the agency and contractor.

Prior to attending class, participants complete a 5-minute online pre-assessment that identifies their familiarity with their agency’s asphalt pavement construction and inspection topics and issues they hope to address through training. The pre-assessment is distributed by the Local Coordinator on behalf of the instructor.

Outcomes
Upon completion of the course, participants will be able to:

• Explain the agency’s and contractor’s roles and responsibilities in supporting project quality
• Identify asphalt pavement construction best practices
• Relate common asphalt pavement construction issues to possible causes and impact on pavement performance
• Explain how to communicate construction issues to the contractor and up the project chain of command effectively
• Describe appropriate, timely inspection documentation procedures

Target Audience
This course is designed for participants who ensure a project is built to the owner’s specifications. Participants can be relatively new to asphalt or general project inspection; however, those with broader experience will learn about innovative asphalt pavement construction technologies, participate in class discussions, and share successful practices. The primary audience comprises Federal, State, consultant, and local agency inspectors and contractor personnel who are involved in the planning, construction, and review of asphalt paving projects.

Training Level: Intermediate

Fee: 2022: $500 Per Person; 2023: $500 Per Person

Length: 2 DAYS (CEU: 1.3 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131139V

Course Title
Constructing and Inspecting Asphalt Paving Projects (Virtual Delivery of NHI 131139)

Course will no longer be offered virtually after November 3, 2022

The goal of this course is to prepare participants to ensure asphalt pavement construction projects conform to quality and technical specifications. The course materials introduce asphalt pavement construction best practices, from the importance of understanding project administration roles and responsibilities to the most vital elements of laydown operations and compaction.

Participants learn construction management responsibilities; recognize proper construction practices; identify construction issues and their source; determine the impact of construction issues on performance; and select communication strategies for contractors, consultants, and superiors. They can then apply the knowledge and skills to maximize quality on construction projects.

The course emphasizes the importance of a proactive approach to managing and inspecting construction projects at every stage. This includes quickly addressing problems, implementing corrective actions, and documenting communications between the agency and contractor.

Prior to attending class, participants complete a 5-minute online pre-assessment that identifies their familiarity with their agency’s asphalt pavement construction and inspection topics and issues they hope to address through training. The pre-assessment is distributed by the Local Coordinator on behalf of the instructor.

The 131139V - Constructing and Inspecting Asphalt Paving Projects is now offered on-line as a virtual course. A virtual instructor-led training provides 100% remote learning while ensuring participants have access to expert instructors, workshop activities, and engaging peer-to-peer discussions. Sessions are typically held as half-day events over four days.

Register today and learn the importance of a proactive approach to managing and inspecting construction projects at every stage in the convenience of your home and/or office anywhere in the country, remotely.

Outcomes
Upon completion of the course, participants will be able to:

• Explain the agency’s and contractor’s roles and responsibilities in supporting project quality
• Identify asphalt pavement construction best practices
• Relate common asphalt pavement construction issues to possible causes and impact on pavement performance
• Explain how to communicate construction issues to the contractor and up the project chain of command effectively
• Describe appropriate, timely inspection documentation procedures

Target Audience
This course is designed for participants who ensure a project is built to the owner’s specifications. Participants can be relatively new to asphalt or general project inspection; however, those with broader experience will learn about innovative asphalt pavement construction technologies, participate in class discussions, and share successful practices.

The primary audience comprises Federal, State, consultant, and local agency inspectors and contractor personnel who are involved in the planning, construction, and review of asphalt paving projects.
Training Level: Intermediate

Fee: 2022: $500 Per Person; 2023: N/A

Length: 16 Hours (CEU: 1.3 Units)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131140

Course Title
Hot In-place Recycling

This training was developed by the Transportation Curriculum Coordination Council (TCCC) in partnership with AASHTO and NHI. Hot in-place recycling (HIR) is a pavement preservation and corrective maintenance technique that consists of heating and softening the existing asphalt pavement. When combined with an asphalt overlay, HIR can be classified as structural rehabilitation.

The HIR techniques described in this training provide owner agencies with cost-effective and sustainable methods to repair their aging pavements. HIR processes have been used on all functional classes of roadways. When properly designed, specified, and constructed, HIR methods can result in significant cost savings as compared to conventional maintenance operations, while reducing carbon dioxide emissions.

This course contains three modules:
1. Introduction to Hot In-Place Recycling
2. Pre-Production Inspection
3. Full Production Pavement Recycling

Outcomes
Upon completion of the course, participants will be able to:
- Explain the purpose, benefits, and use of HIR;
- Identify the purpose and use of HIR designs and the equipment used for its applications;
- Identify the preparation and planning steps necessary for an HIR application; and
- Describe the production, evaluation, steps necessary for an HIR application.

Target Audience
This course is intended for local, county, and State owner agency technicians and inspectors. It is also useful for individuals who need awareness or basic understanding of hot in-place recycling. Training level: This training is recommended for the Transportation Curriculum Coordination Council levels I, II, III, and IV.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 2.5 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131141

Course Title
Quality Assurance for Highway Construction Projects

This course replaces NHI course #134064 Transportation Construction Quality Assurance.

Construction materials account for about 50% of Federal-aid spending (FHWA internal review citation here). Therefore, it is critical for States to have a quality assurance (QA) program to ensure that projects perform as expected and are long lasting. In fact, all States are required to have a QA program for Federal-aid projects on the NHS (23 CFR 637), but risks and inconsistencies in those programs present significant challenges to maintaining levels of quality in materials and project-produced materials such as asphalt, concrete, aggregate and soil.

NHI 131141 Quality Assurance for Highway Construction Projects helps you (1) understand the impact and importance of operating a sound quality assurance program, (2) realize the associated risks to payment, and (3) recognize risks to infrastructure performance. During the course you will consistently apply quality assurance concepts and identify strengths and weaknesses in your own agency’s QA program.

This new 2-day instructor-led course prepares you to identify and use the six core elements of a quality assurance program for all types of highway projects, from the simplest to most complex. All the course content, including risk-based content, is related to practical experiences and provides numerous opportunities to share and learn from other participants. Topics include:

- Basics of quality assurance
- Quality assurance program requirements including industry and agency support, the six core elements of a program, and the use of QA specifications
- Quality control and acceptance including contractor and agency roles and responsibilities; QC plans; sampling, testing, and inspection; and control charts
- Using data to measure quality including collecting data, analyzing data, interpreting data, and quantifying data variability
- Payment including percent within limits and pay factors
- Verification and materials testing dispute resolution

Outcomes
Upon completion of the course, participants will be able to:

- Consistently apply fundamental quality assurance concepts, terminology, and definitions
- Relate each of the six core elements of quality assurance to successful implementation of a quality assurance program
- Describe an organizational culture of quality
- Describe the quality assurance roles and responsibilities of agency and contractor personnel
- Apply the sampling protocols and mathematical concepts used to measure variability, review the effects of statistical distribution, and validate data to assess quality
- Describe the proper use of materials testing and inspection data for acceptance
- Relate successful quality assurance practices to alternative contracting methods
- Learn effective quality assurance practices to minimize the variability and life cycle cost associated with the construction and maintenance of a highway project

Target Audience
This is an intermediate-level course for personnel with at least one year’s experience working with transportation materials and construction who apply QA specifications on transportation construction projects. Typical attendees include: Federal, state, and local agency materials and construction staff including inspectors, lab personnel, field technicians, and project managers, as well as Headquarters’ engineers and Region- or District-level engineers and technicians. Secondary audiences that will benefit from the course and add value to discussions include contractor personnel, particularly their quality control managers. Additionally, consultants working for contractors or the agency as part of the quality assurance program could benefit.
TRAINING LEVEL: Intermediate

FEE: 2022: $200 Per Person; 2023: $200 Per Person

LENGTH: 2 DAYS (CEU: 1.3 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131142

Course Title
Full Depth Reclamation (FDR)

Full Depth Reclamation, or FDR, is a rehabilitation technique in which the full thickness of the asphalt pavement and a predetermined portion of the underlying materials (that is, the base, the subbase, and/or subgrade) is uniformly pulverized and blended to provide an upgraded, homogeneous material.

FDR was originally limited to low to medium traffic volume roadways; however, newer and larger equipment options mean that FDR now can be used on high traffic volume roadways. There is no upper limit to roadway traffic volumes if a pavement structural design is undertaken as part of the rehabilitation process and traffic control allows for diversion of traffic or travel on a pulverized or stabilized surface without damage.

This Web-based training contains four modules. Module 1 introduces full depth reclamation of pavements. Module 2 presents pre-production activities associated with FDR, including the pre-production meeting, roadway preparation, and FDR equipment. Module 3 covers establishing a control strip and pulverizing material, and explores various methods and agents used for stabilizing reclaimed materials. Module 4 reviews post-production actions following reclamation. It takes approximately 4.5 hours to complete the four modules.

This training was developed by the Transportation Curriculum Coordination Council (TCCC) in partnership with AASHTO and NHI.

Outcomes
Upon completion of the course, participants will be able to:

- Describe why a pre-production meeting is important
- Describe what preparation is needed for a full depth reclamation project
- List the equipment needed for a full depth reclamation project
- Identify the purposes of a control strip
- Describe the process used to pulverize existing pavement material for FDR
- List methods used to stabilize reclaimed materials
- Describe the stabilizing agents and additives used for stabilization of reclaimed materials
- Describe the finishing steps involved in full-depth reclamation
- Identify factors and actions that can affect yield and gradation result
- Describe the different methods of measuring compaction and the effect stabilizing agents may have on the results
- List factors affecting how various FDR mixtures should be cured
- Describe the steps involved in placing the final surface on a pavement
- List criteria for acceptance and payment for FDR pavements

Target Audience
This training is designed for local, county, and state owner agency technicians and inspectors. It is also useful for individuals seeking awareness or basic understanding of the topic. This training was developed by the Transportation Curriculum Coordination Council (TCCC) in partnership with AASHTO and NHI, and is recommended for TCCC levels II through IV.
TRAINING LEVEL: Basic

FEE: 2022: $50 Per Person; 2023: $0 Per Person

LENGTH: 4.5 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-132036

COURSE TITLE
Earth Retaining Structures

The goal of this course is to provide agencies with state-of-the-practice design tools and construction techniques to expand implementation of safe and cost-effective earth retention technologies. This course addresses the selection, design, construction, and performance of earth retaining structures used for support of fills and excavations or cut slopes. Instructors cover factors that affect wall selection, including contracting approaches with an emphasis on required bidding documents for each approach. Class discussions will include design procedures and case histories, demonstrating the selection, design, and performance of various earth retaining structures. Detailed information on subsurface investigation, soil and rock property design parameter selection, lateral earth pressures for wall system design, and load and resistance factor design (LRFD) for retaining walls are provided.

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe potential applications for Earth Retaining Structures (ERS)
• Select a technically appropriate and cost-effective ERS
• Select appropriate material properties, soil design parameters, and earth pressure diagrams
• Perform design analysis and prepare conceptual designs
• Review contractor submitted documents
• Discuss contracting methods
• Describe construction and inspection activities for ERS

TARGET AUDIENCE
The primary audience for this course is agency and consultant bridge/structures, geotechnical, and roadway design engineers; engineering geologists; and consultant review specialists. In addition, management, specification, and contracting specialists and construction engineers involved in design and contracting aspects of retaining structures are encouraged to attend. Attendees should have a basic knowledge of soil mechanics and structural engineering, including some understanding of LRFD concepts.

TRAINING LEVEL: Intermediate

FEE: 2022: $950 Per Person; 2023: $950 Per Person

LENGTH: 3 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132040

Course Title
Geotechnical Aspects of Pavements

This course covers the latest methods and procedures to address the geotechnical issues in pavement design, construction, and performance for new construction, reconstruction, and rehabilitation pavement projects. The course content includes geotechnical exploration and characterization of in-place and constructed subgrades; design and construction of subgrades and unbound layers for paved and unpaved roads, with emphasis on the American Association of State Highway Transportation Officials (AASHTO) 1993 empirical design procedure and on the new Mechanistic-Empirical Pavement Design Guide (MEPDG); drainage of bases, subbases, and subgrades and its impact on providing safe, cost-effective, and durable pavements; problematic soils, soil improvement, stabilization, and other detailed geotechnical issues in pavement design and construction; and construction methods, specifications, and QC/QA (quality control/quality assurance) inspection for pavement projects.

The goal of the course is for each participant to recognize the importance of the geotechnical aspects relevant to the design, construction, and performance of a pavement system. Participants will develop an appreciation for the importance of adequate subsurface exploration and laboratory characterization of subgrade soils as well as the requisite pavement design parameters for subgrades, unbound base and subbase layers, including drainage features. The course is designed to elicit maximum input from participants, particularly regarding an understanding of the impact of geotechnical features on the long-term performance of pavement systems.

NOTE TO PARTICIPANT: Please bring a calculator that can perform trigonometric, log, and other engineering calculations, a note pad, and a pencil.

NOTE TO HOST: For this course, the host is asked to identify a state speaker to conduct a host state presentation. The presentation is usually on the first day of the class and lasts approximately 25 minutes with an additional 15 minutes of discussion. The objective of the presentation is to communicate the state’s current practices and experience to the course participants. The state representative should have experience in geotechnical pavement activities. A detailed list of issues to be addressed in the host presentation will be provided. Also for this course, the host is asked to secure at least 6 laptop computers to be used during team exercises. The host can request that at least 6 participants bring their laptops to the course. The machines must have Microsoft Excel (Office 97 or later) and the optional Solver add-in tool installed. Lastly, the host state is asked to complete a “Questionnaire on Geotechnical Practices in Pavement Design” and provide policies and special provisions for (1.) obtaining subsurface information and laboratory testing in relation to pavement design, (2.) pavement design along with any agency design guides, (3.) field construction monitoring for subgrade approval and pavement component approval as well as contractors QC requirements for pavement component construction.

Outcomes

Upon completion of the course, participants will be able to:
• Explain the geotechnical parameters of interest in pavement design and their effects on the performance of different types of pavements
• Explain the influence of climate, moisture, and drainage on pavement performance
• Identify and explain the impact of unsuitable subgrades on pavement performance
• Determine the geotechnical inputs needed for design of pavements, both for the AASHTO 93 empirical design procedure and the new MEPDG
• Evaluate and select appropriate remediation measures for pavement subgrades
• Explain the geotechnical aspects of construction specifications and inspection requirements
• Identify subgrade problems during construction and develop recommended solutions

Target Audience

Many groups within an agency are involved with different aspects of definition, design, use, and construction verification of pavement geomaterials. These groups include pavement design engineers, geotechnical engineers, materials engineers, specification writers, and construction engineers who are or will be involved in the design, evaluation, and construction (or reconstruction or rehabilitation) of pavements. This course was developed as a forum for these various personnel to work together to enhance current procedures for building and maintaining more cost-efficient pavement.
structures.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $950 Per Person; 2023: $950 Per Person

**LENGTH:** 3 DAYS (CEU: 1.8 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134001

Course Title
Principles and Applications of Highway Construction Specifications

Well-written highway construction specifications are those that can be interpreted accurately to minimize confusion and reduce owner-contractor disputes. Across the country, current practices, standards, and requirements for writing specifications are changing. Agencies also are using effective specifications to manage risk and support alternative contracting methods.

NHI 134001 Principles of Writing Highway Construction Specifications is a highly engaging, two-day, instructor-led training session. It includes content that highlights the role of specifications as contract documents and tools for assigning risk. Course participants engage in lessons and practice sessions to identify types of specifications, select the most appropriate type for a given project, and generate an original, effective highway construction specification.

Course content emphasizes the use of effective grammar and writing style so that the learners can generate specifications that are correct, consistent, clear, complete, and concise.

Outcomes
Upon completion of the course, participants will be able to:

• Explain the purposes of a specification.
• Explain how specifications are used to assign risk and influence the behavior of different parties, within a given scenario.
• Compare the functions of Standard and Supplemental Specifications with the functions of Special Provisions.
• Explain how the “order of precedence” affects writing specifications and preparing plans.
• Describe the purpose of the General Provisions.
• Explain how a consistent writing style can affect the interpretation of specifications.
• Complete a checklist of the information needed before writing or revising a specification.
• Explain the potential benefits of writing in the active voice.
• Rewrite passive voice sentences into the active voice.
• Evaluate specifications to determine the need for imperative or indicative mood.
• State the five Cs used in specification writing. (Note: the five Cs include: correct; consistent; clear; complete; concise.)
• Explain each element of the AASHTO five-part format.
• Identify potential ambiguities in the wording, given a sample specification.
• Identify the potential benefits of each of the five Cs, given a sample specification.
• Apply the five Cs and the host agency’s preferred format to revise the specification, given a sample specification.
• Write a new specification to a given set of criteria using the five Cs and the host agency’s preferred format, given a sample specification.
• Compare method versus end-result specifications.
• Relate the type of specification to the allocation of risk.
• Write an end-result specification to replace a method specification, given an excerpt from a method specification.

Target Audience
This course is designed primarily for individuals who write, review, and implement an agency’s contract specifications. Participants might represent Federal, State, and local transportation agencies; other public agencies; contractors; and consultant firms. Individuals who do not write specifications but may contribute to their development, as well as those who use specifications, could also benefit from this course and the interaction with their classmates. Such participants might include personnel from environmental, materials, or construction sections or units; legal departments; work zone and safety professionals; contractor personnel; and any others involved with the design and construction of transportation facilities.
TRAINING LEVEL: Intermediate

FEE: 2022: $550 Per Person; 2023: $800 Per Person

LENGTH: 2 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134001T

COURSE TITLE
Principles and Applications of Highway Construction Specifications (EXAM ONLY FOR 134001V)

THIS IS THE EXAM ONLY AND CEUs WILL BE AWARDED FOR 134001V.

Well-written highway construction specifications are those that can be interpreted accurately to minimize confusion and reduce owner-contractor disputes. Across the country, current practices, standards, and requirements for writing specifications are changing. Agencies also are using effective specifications to manage risk and support alternative contracting methods.

NHI 134001 Principles of Writing Highway Construction Specifications is a highly engaging, two-day, instructor-led training session. It includes content that highlights the role of specifications as contract documents and tools for assigning risk. Course participants engage in lessons and practice sessions to identify types of specifications, select the most appropriate type for a given project, and generate an original, effective highway construction specification.

This is not a grammar course; however, adequate course content emphasizes the use of basic grammar and writing style so that the learners can generate specifications that are correct, consistent, clear, complete, and concise.

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain the purposes of a specification.
• Explain how specifications are used to assign risk and influence the behavior of different parties, within a given a scenario.
• Compare the functions of Standard and Supplemental Specifications with the functions of Special Provisions.
• Explain how the “order of precedence” affects writing specifications and preparing plans.
• Describe the purpose of the General Provisions.
• Explain how a consistent writing style can affect the interpretation of specifications.
• Complete a checklist of the information needed before writing or revising a specification.
• Explain the potential benefits of writing in the active voice.
• Rewrite passive voice sentences into the active voice.
• Evaluate specifications to determine the need for imperative or indicative mood.
• State the five Cs used in specification writing. (Note: the five Cs include: correct; consistent; clear; complete; concise.)
• Explain each element of the AASHTO five-part format.
• Identify potential ambiguities in the wording, given a sample specification.
• Identify the potential benefits of each of the five Cs, given a sample specification.
• Apply the five Cs and the host agency’s preferred format to revise the specification, given a sample specification.
• Write a new specification to a given set of criteria using the five Cs and the host agency’s preferred format, given a sample specification.
• Compare method versus end-result specifications.
• Relate the type of specification to the allocation of risk.
• Write an end-result specification to replace a method specification, given an excerpt from a method specification.

TARGET AUDIENCE
This course is designed primarily for individuals who write, review, and implement an agency’s contract specifications. Participants might represent Federal, State, and local transportation agencies; other public agencies; contractors; and consultant firms. Individuals who do not write specifications but may contribute to their development, as well as those who use specifications, could also benefit from this course and the interaction with their classmates. Such participants might include personnel from environmental, materials, or construction sections or units; legal departments; work
zone and safety professionals; contractor personnel; and any others involved with the design and construction of transportation facilities.

**TRAINING LEVEL:** Intermediate

**FEE:**
- 2022: $0 Per Person; 2023: N/A

**LENGTH:** 1 HOURS (CEU: 0 UNITS)

**CLASS SIZE:**
- MINIMUM: 20; MAXIMUM: 30

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134001V

COURSE TITLE
Principles and Applications of Highway Construction Specifications (Virtual Delivery of 134001)

Well-written highway construction specifications are those that can be interpreted accurately to minimize confusion and reduce owner-contractor disputes. Across the country, current practices, standards, and requirements for writing specifications are changing. Agencies also are using effective specifications to manage risk and support alternative contracting methods.

NHI 134001V - Principles of Writing Highway Construction Specifications is now offered on-line as a virtual course. A virtual instructor-led training provides 100% remote learning while ensuring participants have access to expert instructors, workshop activities, and engaging peer-to-peer discussions. Sessions are typically held as half-day events over four days.

It includes content that highlights the role of specifications as contract documents and tools for assigning risk. Course participants engage in lessons and practice sessions to identify types of specifications, select the most appropriate type for a given project, and generate an original, effective highway construction specification.

Course content emphasizes the use of effective grammar and writing style so learners can generate specifications that are correct, consistent, clear, complete, and concise.

Register today to experience a highly engaging, online instructor-led training session from the convenience of your home and/or office anywhere in the country, remotely.

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain the purposes of a specification.
• Explain how specifications are used to assign risk and influence the behavior of different parties, within a given scenario.
• Compare the functions of Standard and Supplemental Specifications with the functions of Special Provisions.
• Explain how the “order of precedence” affects writing specifications and preparing plans.
• Describe the purpose of the General Provisions.
• Explain how a consistent writing style can affect the interpretation of specifications.
• Complete a checklist of the information needed before writing or revising a specification.
• Explain the potential benefits of writing in the active voice.
• Rewrite passive voice sentences into the active voice.
• Evaluate specifications to determine the need for imperative or indicative mood.
• State the five Cs used in specification writing. (Note: the five Cs include: correct; consistent; clear; complete; concise.)
• Explain each element of the AASHTO five-part format.
• Identify potential ambiguities in the wording, given a sample specification.
• Identify the potential benefits of each of the five Cs, given a sample specification.
• Apply the five Cs and the host agency’s preferred format to revise the specification, given a sample specification.
• Write a new specification to a given set of criteria using the five Cs and the host agency’s preferred format, given a sample specification.
• Compare method versus end-result specifications.
• Relate the type of specification to the allocation of risk.
• Write an end-result specification to replace a method specification, given an excerpt from a method specification.

TARGET AUDIENCE
This course is designed primarily for individuals who write, review, and implement an agency’s contract specifications.
Participants might represent Federal, State, and local transportation agencies; other public agencies; contractors; and consultant firms. Individuals who do not write specifications but may contribute to their development, as well as those who use specifications, could also benefit from this course and the interaction with their classmates. Such participants might include personnel from environmental, materials, or construction sections or units; legal departments; work zone and safety professionals; contractor personnel; and any others involved with the design and construction of transportation facilities.

**TRAINING LEVEL:** Intermediate

**FEE:** 2022: $550 Per Person; 2023: $650 Per Person

**LENGTH:** 12 HOURS (CEU: 1.2 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134097

Course Title
Fresh Concrete Properties

This training is provided by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to review integrated materials and construction practices for concrete pavement. The training was developed by the National Concrete Pavement Technology Center at Iowa State University. This training is recommended for the Transportation Curriculum Coordination Council levels III and IV. This course is primarily intended for inspectors and technicians.

This module covers the properties of fresh concrete needed to produce high-quality, long-lasting pavements and how to monitor these properties.

This module is part of a curriculum from the “Integrated Materials and Construction Practices for Concrete Pavement” manual developed through the National Concrete Pavement Technology Center at Iowa State University. The other Web-based training modules include:

- FHWA-NHI-134075 TCCC Hardened Concrete Properties - Durability
- FHWA-NHI-134084 TCCC Fundamentals of Materials Used for Concrete Pavements
- FHWA-NHI-134085 TCCC Incompatibility in Concrete Pavement Systems
- FHWA-NHI-134087 TCCC Mix Design Principles
- FHWA-NHI-134095 TCCC Early Age Cracking
- FHWA-NHI-134096 TCCC Basics of Cement Hydration
- FHWA-NHI-134098 TCCC Construction of Concrete Pavements
- FHWA-NHI-134100 TCCC QCQA for Concrete Pavements
- FHWA-NHI-134101 TCCC Design of Pavement
- FHWA-NHI-134102 TCCC Troubleshooting for Concrete Pavements

Outcomes
Upon completion of the course, participants will be able to:

- List the main properties of fresh concrete
- Describe what affects each property
- Recognize how to monitor these properties through concrete testing

Target Audience
This training is designed for FHWA, State, and local agencies and their industry counterparts involved in the process to assure that the properties of a concrete mixture provide ease in placement, ease of consolidation, and long-lasting pavement. It is applicable to anyone desiring a better understanding of the properties of Portland cement concrete.

Training Level: Intermediate

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 1 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134101

Course Title
Design of Pavement

This training is provided by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to review integrated materials and construction practices for concrete pavement. The training was developed by the National Concrete Pavement Technology Center at Iowa State University. This training is recommended for the Transportation Curriculum Coordination Council levels III and IV. This course is primarily for inspectors and technicians.

This module covers pavement design and subgrade concepts as they relate to materials and construction. It does not provide sufficient detail to actually design or evaluate a design. It covers the primary goal of pavement design, which is to provide a pavement with the following characteristics: safe, long lasting, cost effective, low maintenance, and constructible.

This module is part of a curriculum from the “Integrated Materials and Construction Practices for Concrete Pavement” manual developed through the National Concrete Pavement Technology Center at Iowa State University. The other Web-based training modules include:

FHWA-NHI-134075 TCCC Hardened Concrete Properties - Durability
FHWA-NHI-134084 TCCC Fundamentals of Materials Used for Concrete Pavements
FHWA-NHI-134085 TCCC Incompatibility in Concrete Pavement Systems
FHWA-NHI-134087 TCCC Mix Design Principles
FHWA-NHI-134095 TCCC Early Age Cracking
FHWA-NHI-134096 TCCC Basics of Cement Hydration
FHWA-NHI-134097 TCCC Fresh Concrete Properties
FHWA-NHI-134098 TCCC Construction of Concrete Pavements
FHWA-NHI-134100 TCCC QCQA for Concrete Pavements
FHWA-NHI-134102 TCCC Troubleshooting for Concrete Pavements

Outcomes

Upon completion of the course, participants will be able to:

• Identify pavement types and design features
• Recognize what design variables are controlled by field operations
• Discuss the two primary types of pavement distresses (performance measures)
• Recognize how subgrades and bases affect construction operations and long-term pavement performance

Target Audience

This training is designed for FHWA, State, and local agencies and their industry counterparts involved in designing, constructing, and inspecting Portland cement concrete pavements.

Training Level: Intermediate

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 1 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134109B

COURSE TITLE
Maintenance Training Series: Shaping and Shoulders

Shoulders play an important role in both pavement performance and roadway safety. Maintaining shoulders in a proper and timely manner is a primary goal of transportation agencies. In an effort to assist agencies in meeting this goal, the Shaping and Shoulders training provides information on the maintenance of both paved and unpaved shoulders, including specific details on the maintenance of gravel shoulders. This course is primarily intended for inspectors and technicians.

In addition to a discussion of the various types of shoulders, project selection considerations, and key maintenance issues, this training places shoulders and shaping into the context of an overall maintenance and pavement preservation program.

This training was developed as part of the Maintenance Training Series. To access all the trainings in the series, enroll in the 134109 course.

OUTCOMES
Upon completion of the course, participants will be able to:

• Identify desirable characteristics of various types of shoulders
• Identify project selection considerations for shaping and shoulders
• Describe shoulder shaping and blading activities, including equipment requirements and construction activities
• Describe how a shoulder and ditching program forms the core of the overall maintenance and pavement preservation program

TARGET AUDIENCE
This course is designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

TRAINING LEVEL: Basic

FEE: 2022: $25 Per Person; 2023: $0 Per Person

LENGTH: 1.5 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134109C

Course Title
Maintenance Training Series: Thin HMA Overlays and Leveling

Thin HMA overlays and leveling are common pavement treatments and can be a central part of a maintenance crew’s activities. During the Thin HMA Overlays and Leveling training, participants will be introduced to the characteristics and purposes of thin HMA overlays as well as the placement of leveling courses. Each of these techniques is capable of improving the functionality of an otherwise structurally sound pavement.

The training also covers information on the materials, personnel, and equipment needed for thin HMA overlays; items that should be considered when making project selection decisions; and guidance on proper mixture compaction. This information is designed to help participants improve project planning and execution for thin HMA overlays and leveling treatments.

This training was developed as part of the Maintenance Training Series. To access all the courses in the series, enroll in the 134109 course.

Outcomes
Upon completion of the course, participants will be able to:

• Determine the purpose of thin HMA overlays and leveling courses
• Identify material components of HMA overlays
• Identify personnel and equipment needed for HMA overlays and leveling construction
• Identify project selection considerations for thin HMA overlays and leveling
• Identify how this treatment can be incorporated into an overall system preservation program

Target Audience
This course is designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 1.5 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134109D

Course Title
Maintenance Training Series: Base and Subbase Stabilization and Repair

Before preservation treatments can be applied, localized repairs may be necessary for a pavement’s base or subbase. The Base and Subbase Stabilization and Repair course gives participants the knowledge they need to determine if the base or subbase must be stabilized or repaired, to select the appropriate stabilization and repair methods for a given project, and to ensure the repair is performed properly.

This training reviews the failures and distresses that indicate structural deterioration exists in a roadway. The course also covers project selection and trade-off considerations through example roadway projects that give participants the opportunity to evaluate a roadway and determine if it is a candidate for reconstruction or repair. Participants can use this information, as well as guidance on design and construction, to make sound project planning decisions.

This training was developed as part of the Maintenance Training Series. To access all the courses in the series, enroll in the 134109 course.

Outcomes
Upon completion of the course, participants will be able to:

• Identify the symptoms of a localized base or subbase problem, which require greater depth of stabilization and repair than a hot-mix asphalt (HMA) or portland cement concrete (PCC) surface repair patch
• Determine when it is appropriate to employ base or subbase repair on a preventive maintenance project
• Identify the most appropriate repair methods if base or subbase failures are identified in a project

Target Audience
This course is designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 1 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134109E

Course Title
Maintenance Training Series: Roadway Drainage

Shoulder, ditch, and pipe or culvert maintenance activities are performed frequently throughout the year. These activities are critical for avoiding hazardous roadway conditions and extending the life of pavements by controlling water flow along maintainable pathways. This course, Roadway Drainage, provides information on the purpose, function, and components of roadway drainage systems.

This course reviews the components of shoulders and ditches, the purpose of a roadway drainage inventory, and the permits used in roadway drainage maintenance. Examples of existing drainage inventories are provided. In addition, the benefits of proper water removal are discussed through examples of drainage system issues, such as ponding and washouts, in order to emphasize the connection between good drainage and roadway safety.

This training was developed as part of the Maintenance Training Series. To access all the courses in the series, enroll in the 134109 course.

Outcomes
Upon completion of the course, participants will be able to:

- Identify the purpose and function of roadway drainage systems
- Identify eight components of roadway drainage systems
- Identify the purpose of a roadway drainage inventory
- Identify the purpose of permits in roadway drainage maintenance
- Identify the components of shoulders and ditches

Target Audience
This course is designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 1 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Probabilistic Risk-Based Estimating for Highway Project Cost and Schedule

This course is an interactive eBook that provides you an awareness of concepts and processes utilized to successfully implement probabilistic risk-based estimating (PRBE). Participants will use the eBook as a reference to understand basic terminology and recognize good practices when structuring a project for risk assessment. This interactive eBook allows participants to relate basic concepts and processes to real-world examples, case studies and challenges.

The purpose of this course is to help participants acquire knowledge to improve timely project delivery and limit the costs and delays associated with inaccurate cost and schedule estimation, as well as to help participants realize the potential benefits of a well-constructed, thoroughly reviewed, and properly communicated PRBE estimate.

Participants will understand the need for PRBE, recognize how to conduct a successful PRBE risk workshop to support risk analysis, and use results to enhance project delivery by reducing risks to project cost and schedule objectives.

By acquiring new skills, the participants will improve their ability to manage project cost and schedule.

Examples of these capabilities include:

Understanding the need for PRBE.

Using PRBE results to enhance project delivery.

Properly setting up and structuring a cost estimate for risk analysis.

Utilize risk assessment to develop reliability estimates of cost and schedule and identify significant project risks.

Presenting risk workshop results to leadership for improved decision-making.

Recognizing how to set up a successful risk workshop for input to risk assessment.

After completing the self-paced eBook, participants return to their NHI My Training page to complete the exam and receive a certificate of completion and CEUs.

OUTCOMES

Upon completion of the course, participants will be able to:

1. Describe the relationship between project management, risk management, and PRBE.
2. Compare traditional and risk-based estimating.
3. Describe how PRBE results can be used to effectively manage a project.
4. Identify key benefits of PRBE to agency leadership and the public.
5. Explain the benefits of using PRBE results.
6. Compare traditional estimating to PRBE.
7. Describe the four basic components of uncertainty.
8. Define risk, likelihood, and impact.
9. Describe the difference between dependency and correlation.
10. Differentiate the approaches to “minor” and “significant” risk.
11. Describe how uncertainty is expressed through base estimate.
12. Explain the purpose of the forecast chart.
13. Describe the types of risks appropriate for the risk register and how they may be assessed.
14. Describe at least three types of risk response.
15. Provide an example of criteria used to accept risk.
16. Describe a method used to prioritize risk.
17. Describe what is meant by “basis of estimate.”
18. Define base estimate.
• 3.3 Evaluate a given project delivery schedule and define the different cost phases (design, right-of-way (ROW), and construction) and segments for analysis.
• 3.4 Describe two significant components of base uncertainty.
• 3.5 Compare top-down versus bottom-up base variability.
• 3.6 Differentiate the modeling approach to market conditions and inflation.
• 3.7 Identify three methods of risk identification.
• 3.8 Identify at least four types of bias.
• 3.9 Evaluate PRBE results to enhance project delivery.
• 3.10 Describe how significant risks are represented in risk-based results.
• 3.11 Compare low-probability and high-impact risk versus high-probability and high-impact risk.
• 3.12 List common PRBE outputs.
• 4.1 Describe the elements of an effective risk workshop.
• 4.2 Apply scalability factors for a given workshop scenario.
• 4.3 Explain how PRBE results can be used to treat risk.
• 4.4 Identify key participants in a risk workshop and describe their responsibilities.
• 4.5 Describe how the impact of uncertainty can be assessed by subject matter experts.
• 4.6 Explain what is meant by “conditioning” workshop participants.
• 4.7 Verify risk workshop results.
• 4.8 Identify the components of an effective PRBE presentation

TARGET AUDIENCE
The target audience includes DOTs and FHWA Division Offices. The primary target audience for this eBook includes DOT and FHWA staff, including planners, project managers, and cost-estimate staff, as well as Headquarters’ engineers and region- or district-level engineers. Secondary target audiences may include State subject matter experts in the areas of real estate, environment, construction, and geo-technology. Additionally, large local agencies and consultants working for contractors or the agency as part of the project delivery team could benefit from this eBook.

TRAINING LEVEL: Intermediate

FEE: 2022: $50 Per Person; 2023: $0 Per Person

LENGTH: 10 HOURS (CEU: 1 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
How to Construct Durable Full-Depth Repairs in Concrete Pavements

Full-depth repairs are used to restore localized areas of slab damage that extend beyond the upper one-third of slab depth or originate from the slab bottom.

This course provides a comprehensive guide for performing full-depth repairs—from planning for, preparing, and evaluating the repair through testing and quality assurance after construction is complete. In the Web-based training you will find detailed, how-to instruction that covers the full scope of tasks involved in successfully completing a full-depth repair project. Instructional methods include short, focused, and task-based lessons, visual aids, and assignments that are directly applicable to work in the field.

OUTCOMES

Upon completion of the course, participants will be able to:

• Explain the purpose of full-depth repairs
• Identify pavement problems that full-depth concrete pavement repairs can and cannot address
• Describe proper project review and material checks for a preservation job involving full-depth repair
• Explain the proper safety and personal protective equipment you will need when performing full-depth repair projects
• Describe the criteria for selecting repair locations and boundaries
• Explain what to do if you think the boundaries are marked incorrectly
• Explain how patching materials are selected for full-depth repair
• Describe the patch material mixing and handling factors that impact the quality of the repair
• Describe the different types of perimeter joint faces for transverse and longitudinal joints
• List important considerations for sawing perimeter joints
• Explain how deteriorated concrete can be removed from the repair area
• List the steps you can take to minimize damage to surrounding pavement when removing concrete
• Describe how to prepare the repair area for new concrete
• Define load transfer
• Describe important considerations for installing dowel bars for full-depth repairs
• List the three ways to connect longitudinal steel for CRCP full-depth repairs
• Explain how to handle the longitudinal joints in longer and shorter patches
• Explain the steps required to place, finish, and cure the concrete for a full-depth repair
• Describe the texturing methods used to match the patch texture with the surrounding pavement
• Explain the steps for sealing the patch perimeter joints
• Explain the difference between quality control and acceptance, including who is responsible
• Describe the tests that may be used for acceptance and opening to traffic

TARGET AUDIENCE

This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. This training is ideal for construction foremen, workers, technicians, agency inspectors, construction managers, and engineers.
**Training Level:** Basic

**Fee:** 2022: $25 Per Person; 2023: $0 Per Person

**Length:** 3 Hours (CEU: 0 Units)

**Class Size:** Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134207B

Course Title
How to Construct Durable Partial-Depth Repairs in Concrete Pavements

This course provides a comprehensive guide for performing partial-depth repairs—from planning for, preparing, and evaluating the patch through testing and quality assurance after construction is complete. Partial-depth repairs are defined as the removal and replacement of small areas of deteriorated (or spalled) concrete pavement. Partial-depth repairs are an alternative to full-depth repairs in areas where slab deterioration is located primarily in the upper one-third to upper one-half of the slab and the existing load transfer devices (if any) are still functional.

This important preservation technique can slow or eliminate the spread of spalling distresses that tend to occur under repeated thermal stresses, freezing and thawing, and traffic loading. The information in this course covers all of the considerations for partial-depth repairs including patch materials and construction techniques to produce patches that are cost-effective and can last 10 to 15 years or longer.

You will discover detailed, how-to instruction that covers the full scope of tasks involved in successfully completing a full-depth repair project. The instructional methods in this Web-based training include short, focused, and task-based lessons, visual aids, and assignments that are directly applicable to work in the field.

Outcomes
Upon completion of the course, participants will be able to:

• Explain what a partial-depth repair is, and why it is used
• Identify the types of distresses that partial-depth repair can and cannot address
• Describe the three types of partial-depth repairs used to replace deteriorated concrete
• Describe proper project review and material checks for a preservation job involving partial-depth repair
• Explain worker safety, health, and personal protective device considerations for partial-depth repair projects
• Describe the criteria for selecting repair locations and boundaries
• Explain what to do if you think the boundaries are marked incorrectly
• Describe the methods for removing deteriorated concrete in preparation for a partial-depth repair
• Identify which methods are appropriate for the different types of partial-depth repairs
• Describe how to prepare the existing slab for repair material
• Identify the materials used in a partial-depth repair
• List the factors that influence repair mixture selection
• Identify when compression relief is necessary for a partial-depth repair project
• Describe how to reestablish a joint or crack by installing joint or crack compression relief material or by sawing
• List the four major steps for properly placing the patching material
• Explain the process for completing the patch
• Explain the difference between quality control and acceptance, including who is responsible
• Describe the tests that may be used for acceptance and opening to traffic

Target Audience
This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. This training is ideal for construction foremen, workers, technicians, agency inspectors, construction managers, and engineers.
TRAINING LEVEL: Basic

FEE: 2022: $25 Per Person; 2023: $0 Per Person

LENGTH: 2.5 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134207C

Course Title
Proper Diamond Grinding Techniques for Pavement Preservation

This course provides how-to instruction covering the scope of tasks and considerations involved in performing diamond grinding, diamond grooving, and next generation concrete surfacing (NGCS) operations.

Diamond grinding and grooving are surface restoration procedures used to correct concrete pavement surface distresses or deficiencies. They are often used in conjunction with other pavement preservation techniques (e.g., dowel bar retrofit, partial-depth repairs, full-depth repairs) as part of a comprehensive pavement preservation program. Each technique addresses a specific pavement shortcoming. In some situations, it may be justified to use diamond grinding or diamond grooving as the sole preservation technique. However, this depends on the conditions and characteristics of the specific project.

You will benefit from short, focused, and task-based lessons and visual aids that reinforce content by showing its relevance to work in the field.

Outcomes
Upon completion of the course, participants will be able to:

• Explain what diamond grinding is, and why it is used
• Explain how diamond grinding equipment works
• Describe the steps to take to prepare for diamond grinding on a project
• List the components of the cutting head
• Describe how blade selection impacts grinding success
• Explain basic procedures for safely operating diamond grinding equipment
• Determine when specialized equipment may be necessary
• Explain how to measure head wear
• Define slurry
• Describe how slurry is picked up and disposed of during diamond grinding operations
• Name the diamond grinding machine’s systems and their components
• Identify the system to which each part of the diamond grinding machine belongs
• Describe the function of each part or system on a diamond grinding machine
• Describe how diamond grinding is used to affect road smoothness, noise, and friction
• Explain what Next Generation Concrete Surfacing (NGCS) is, and when it is used
• List considerations for grinding on city streets
• Identify quality issues that can occur during diamond grinding
• Explain how diamond grinding quality issues can be prevented or addressed
• Identify issues that cannot be controlled by the contractor and require owner consideration and input
• Describe the equipment used in diamond grooving operations
• Explain how the diamond grooving texture is achieved

Target Audience
This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. This training is ideal for construction foremen, workers, technicians, agency inspectors, construction managers, and engineers.
**TRAINING LEVEL:** Basic

**FEE:** 2022: $25 Per Person; 2023: $0 Per Person

**LENGTH:** 2 HOURS (CEU: 0 UNITS)

**CLASS SIZE:** MINIMUM: 0; MAXIMUM: 0

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Proper Construction Techniques for Dowel Bar Retrofit (DBR) and Cross-Stitching

This course provides how-to instruction that covers the scope of tasks and considerations involved in performing dowel bar retrofit and cross-stitching operations.

DBR is the installation of dowel bars at existing transverse joints or cracks in order to effectively transfer wheel loads across slabs and reduce deflections. Dowel bars are retrofitted into the joints of existing concrete pavements, which either do not have load transfer devices, or in which the existing devices are no longer functional.

Cross-stitching is a preservation method designed for longitudinal joints or cracks that are in relatively good condition, but that need to be tied stronger together.

This course contains short, focused lessons that are task-based, and contain detailed visual aids and videos, reinforcing content so that it can be directly applied to work in the field.

OUTCOMES

Upon completion of the course, participants will be able to:

- Explain what dowel bar retrofitting and cross-stitching are, and why they are used
- Define load transfer
- Describe the steps you should take to prepare for a project involving DBR or cross-stitching
- Explain the basic components of DBR and cross-stitching projects
- Describe how to determine the size of the components for both DBR and cross-stitching
- Determine the proper locations to use DBR and cross-stitching for different pavement distresses
- Identify the materials used in DBR and cross-stitching operations
- List the important factors in selecting materials for DBR and cross-stitching
- Explain how slots are created and prepared for a DBR project
- Describe how dowel bars should be placed in the slot
- Explain how the backfill material is placed and finished
- Explain how to drill and clean holes for cross-stitching
- Describe the process for installing tie bars
- Explain the procedures for finishing the cross-stitching project
- Describe aspects of DBR and cross-stitching projects that are tested or inspected for quality or acceptance
- List important quality considerations for DBR and cross-stitching projects

TARGET AUDIENCE

This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. This training is ideal for construction foremen, workers, technicians, agency inspectors, construction managers, and engineers.

TRAINING LEVEL: Basic

FEE: 2022: $25 Per Person; 2023: $0 Per Person

LENGTH: 2 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134207E

Course Title
Proper Joint Sealing Techniques for Pavement Preservation

In this course you will find detailed, “how-to” instruction that covers the scope of tasks and considerations involved in performing joint sealing or resealing pavement joints and cracks. Short, focused lessons are task-based in nature and contain detailed visual aids and videos that reinforce content so you can apply new knowledge directly to your work in the field.

Sawed joints are sealed to prevent the intrusion of water, deicing chemicals, and incompressible materials into the pavement structure which can reduce the pavement’s acceptable performance life. Joint sealing is shown to prevent several types of distresses, including joint associated distress, weakening of the base and subgrade supporting structure, blow ups, and voids beneath the joints and subsequent pavement faulting or pumping. It has also been shown recently that when wide joints are used, sealing joints can reduce the overall tire-pavement interaction noise.

Take this course to learn how to employ successful practices and techniques. Specifically, you will learn the answers to these questions:

1. Why is the technique an important part of concrete pavement preservation?
2. What options are available and which options provide the best opportunities for success?
3. What materials are involved in the techniques?
4. What are the specific, sequential tasks required to properly perform joint sealing?

Outcomes
Upon completion of the course, participants will be able to:

• Describe what joint sealing is
• Explain why joints are sealed
• List considerations for preparing for and keeping safe on a joint sealing project
• Describe the materials used in a joint or crack sealing project and their differences
• Describe the standard details used for joint or crack sealing installations
• Identify equipment used for sawing and sealing or resealing joints and cracks
• Describe the purpose of each piece of equipment and how it works
• Explain how a joint or crack is prepared for sealing
• Describe the process for installing the backer rod (if it is used)
• Explain how the sealant or seal is installed
• Describe procedures for applying a penetrating concrete sealer
• Describe procedures for repairing hairline, minor random, and wide cracks
• List important quality considerations for joint sealing projects
• Describe quality control methods you can use to make sure a sealant reservoir is ready for sealant installation and the sealant is installed properly
• Describe how sealant installations are inspected for quality assurance and acceptance
• Identify the distresses or problems that occur with joint sealants and seals
• Explain the steps to take during formed-in-place sealant or compression seal installation

Target Audience
This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. Participants may have some awareness and past involvement with paving processes, but the training is appropriate for learners regardless of experience level with the techniques. The primary audience is contractors. This course will appeal to individuals in the following roles: construction supervisors, workers, and...
technicians; agency inspectors and construction managers; and engineers.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $25 Per Person; 2023: $0 Per Person

**LENGTH:** 4 HOURS (CEU: 0 UNITS)

**CLASS SIZE:** MINIMUM: 0; MAXIMUM: 0

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134207F

Course Title
How to Construct Durable Full-Depth Repairs in Concrete Pavements (Spanish)

This course is in Spanish.

Full-depth repairs are used to restore localized areas of slab damage that extend beyond the upper one-third of slab depth or originate from the slab bottom.

This course, presented in Spanish, provides a comprehensive guide for performing full-depth repairs—from planning for, preparing, and evaluating the repair through testing and quality assurance after construction is complete. In the web-based training you will find detailed, how-to instruction that covers the full scope of tasks involved in successfully completing a full-depth repair project. Instructional methods include short, focused, and task-based lessons, visual aids, and assignments that are directly applicable to work in the field.

Outcomes
Upon completion of the course, participants will be able to:

• Explain the purpose of full-depth repairs
• Identify pavement problems that full-depth concrete pavement repairs can and cannot address
• Describe proper project review and material checks for a preservation job involving full-depth repair
• Explain the proper safety and personal protective equipment you will need when performing full-depth repair projects
• Describe the criteria for selecting repair locations and boundaries
• Explain what to do if you think the boundaries are marked incorrectly
• Explain how patching materials are selected for full-depth repair
• Describe the patch material mixing and handling factors that impact the quality of the repair
• Describe the different types of perimeter joint faces for transverse and longitudinal joints
• List important considerations for sawing perimeter joints
• Explain how deteriorated concrete can be removed from the repair area
• List the steps you can take to minimize damage to surrounding pavement when removing concrete
• Describe how to prepare the repair area for new concrete
• Define load transfer
• Describe important considerations for installing dowel bars for full-depth repairs
• List the three ways to connect longitudinal steel for CRCP full-depth repairs
• Explain how to handle the longitudinal joints in longer and shorter patches
• Explain the steps required to place, finish, and cure the concrete for a full-depth repair
• Describe the texturing methods used to match the patch texture with the surrounding pavement
• Explain the steps for sealing the patch perimeter joints
• Explain the difference between quality control and acceptance including who is responsible
• Describe the tests that may be used for acceptance and opening to traffic

Target Audience
This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. This training is ideal for construction foreman, workers, and technicians; agency inspectors and construction managers; and engineers.
**TRAINING LEVEL:** Basic

**FEE:** 2022: $0 Per Person; 2023: $0 Per Person

**LENGTH:** 3 HOURS (CEU: 0 UNITS)

**CLASS SIZE:** MINIMUM: 0; MAXIMUM: 0

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134207G

Course Title
How to Construct Durable Partial-Depth Repairs in Concrete Pavements (Spanish)

This course is in Spanish.

In this course, presented in Spanish, you will find a comprehensive guide for performing partial-depth repairs from planning, preparing, and evaluating the patch through testing and quality assurance after construction is complete.

Partial-depth repairs are defined as the removal and replacement of small areas of deteriorated, or spalled, concrete pavement. Partial-depth repairs are an alternative to full-depth repairs in areas where slab deterioration is located primarily in the upper one-third to upper one-half of the slab and the existing load transfer devices (if any) are still functional. The technique is an important preservation technique to slow or eliminate the spread of spalling distresses that tend to occur under repeated thermal stresses, freezing and thawing, and traffic loading. The information in this course will cover all of the considerations, including patch materials and construction techniques to produce patches that are cost-effective and can last 10 to 15 years or longer.

Specifically, you’ll learn how to employ successful practices and techniques on concrete pavement preservation projects. The following questions are answered in this course:

Why is the technique an important part of concrete pavement preservation?
What options are available for performing the construction processes and procedures?
Which options provide the best opportunities for success?
What materials are involved in the techniques?
What are the proper techniques for mixing, placing, and curing?

Outcomes
Upon completion of the course, participants will be able to:

• Explain what a partial-depth repair is and why it is used
• Identify the types of distresses that partial-depth repair can and cannot address
• Describe the three types of partial-depth repairs used to replace deteriorated concrete
• Describe proper project review and material checks for a preservation job involving partial-depth repair
• Explain worker safety, health, and personal protective device considerations for partial-depth repair projects
• Describe the criteria for selecting repair locations and boundaries
• Explain what to do if you think the boundaries are marked incorrectly
• Describe the methods for removing deteriorated concrete in preparation for a partial-depth repair
• Identify which methods are appropriate for the different types of partial-depth repairs
• Describe how to prepare the existing slab for repairs
• Identify the materials used in a partial-depth repair
• List the factors that influence repair mixture selection
• Identify when compression relief is necessary for a partial-depth repair project
• Describe how to reestablish a joint or crack by installing joint or crack compression relief material or by sawing
• List the four major steps for properly placing the patching material
• Explain the process for completing the patch
• Explain the difference between quality control and acceptance, including who is responsible
• Describe the tests that may be used for acceptance and opening to traffic

Target Audience
This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. This training is ideal for construction foreman, workers, and technicians; agency inspectors and construction managers; and engineers.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $25 Per Person; 2023: $0 Per Person

**LENGTH:** 3 HOURS (CEU: 0 UNITS)

**CLASS SIZE:** MINIMUM: 0; MAXIMUM: 0

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Proper Diamond Grinding Techniques for Pavement Preservation (Spanish)

This course is in Spanish.

In this course, presented in Spanish, you will find “how-to” instruction covering the scope of tasks and considerations involved in performing diamond grinding, diamond grooving, and next generation concrete surfacing (NGCS) operations. Diamond grinding and grooving are surface restoration procedures used to correct concrete pavement surface distresses or deficiencies. They are often used in conjunction with other pavement preservation techniques (e.g., dowel bar retrofit, partial-depth repairs, full-depth repairs) as part of a comprehensive pavement preservation program. Each technique addresses a specific pavement shortcoming. In some situations, it may be justified to use diamond grinding or diamond grooving as the sole preservation technique; however, this depends on the conditions and characteristics of the specific project.

This course contains short, focused, task-based lessons that include detailed visual aids and videos, which reinforce the content so you can apply new knowledge directly to your work in the field.

Learn how to employ successful practices and techniques on concrete pavement preservation projects. Specifically, you will explore these questions:

- Why is the technique an important part of concrete pavement preservation?
- What options are available for performing the construction processes and procedures?
- Which options provide the best opportunities for success?
- What materials are involved in the techniques?
- What are the proper techniques for mixing, placing, and curing?
- What are the specific, sequential tasks required to properly perform each of the techniques?

OUTCOMES

Upon completion of the course, participants will be able to:

- Explain what diamond grinding is and why it is used
- Explain how diamond grinding equipment works
- Describe the steps to take to prepare for diamond grinding on a project
- List the components of the cutting head
- Describe how blade selection impacts grinding success
- Explain basic procedures for safely operating diamond grinding equipment
- Determine when specialized equipment may be necessary
- Explain how to measure head wear
- Define slurry
- Describe how slurry is picked up and disposed of during diamond grinding operations
- Name the diamond grinding machine’s systems and their components
- Identify the system to which each part of the diamond grinding machine belongs
- Describe the function of each part or system on a diamond grinding machine
- Describe how diamond grinding is used to affect road smoothness, noise, and friction
- Explain what Next Generation Concrete Surfacing (NGCS) is and when it is used;
- List considerations for grinding on city streets
- Identify quality issues that can occur during diamond grinding
- Explain how diamond grinding quality issues can be prevented or addressed
- Identify issues that cannot be controlled by the contractor and require owner consideration and input
• Describe the equipment used in diamond grooving operations
• Explain how the diamond grooving texture is achieved

TARGET AUDIENCE
This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. This training is ideal for construction foreman, workers, and technicians; agency inspectors and construction managers; and engineers.

TRAINING LEVEL: Basic

FEE: 2022: $25 Per Person; 2023: $0 Per Person

LENGTH: 3 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134207I

Course Title
Proper Construction Techniques for Dowel Bar Retrofit (DBR) and Cross-Stitching (Spanish)

This course is in Spanish.

This course provides “how-to” instruction in Spanish that covers the scope of tasks and considerations involved in performing dowel bar retrofit and cross-stitching operations.

DBR is the installation of dowel bars at existing transverse joints or cracks to effectively transfer wheel loads across slabs and reduce deflections. Dowel bars are retrofitted into the joints of existing concrete pavements, which either do not have load transfer devices or in which the existing devices are no longer functional.

Cross-stitching is a preservation method designed for longitudinal joints or cracks that are in relatively good condition, but that need to be tied stronger together.

This course contains short, focused lessons that include detailed instructions along with visual aids and videos that reinforce the content so you can apply it directly to your work in the field. Take this course to find answers to these questions:

Why is the technique an important part of concrete pavement preservation?
What options are available for performing the construction processes and procedures?
Which options provide the best opportunities for success?
What materials are involved in the techniques?
What are the proper techniques for mixing, placing, and curing?
What are the specific, sequential tasks required to properly perform each of the techniques?

Outcomes
Upon completion of the course, participants will be able to:
- Explain what dowel bar retrofitting and cross-stitching are, and why they are used
- Define load transfer
- Describe the steps you should take to prepare for a project involving DBR or cross-stitching
- Explain the basic components of DBR and cross-stitching projects
- Describe how to determine the size of the components for both DBR and cross-stitching
- Determine the proper locations to use DBR and cross-stitching for different pavement distresses
- Identify the materials used in DBR and cross-stitching operations
- List the important factors in selecting materials for DBR and cross-stitching
- Explain how slots are created and prepared for a DBR project
- Describe how dowel bars should be placed in the slot
- Explain how the backfill material is placed and finished
- Explain how to drill and clean holes for cross-stitching
- Describe the process for installing tie bars
- Explain the procedures for finishing the cross-stitching project
- Describe aspects of DBR and cross-stitching projects that are tested or inspected for quality or acceptance
- List important quality considerations for DBR and cross-stitching projects

Target Audience
This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. This training is ideal for construction foreman, workers, and technicians; agency inspectors and...
construction managers; and engineers.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $0 Per Person; 2023: $0 Per Person

**LENGTH:** 3 HOURS (CEU: 0 UNITS)

**CLASS SIZE:** MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134207J

Course Title
Proper Joint Sealing Techniques for Pavement Preservation (Spanish)
This course is in Spanish.

In this course you will find detailed, “how-to” instruction in Spanish that covers the scope of tasks and considerations involved in performing joint sealing or resealing pavement joints and cracks. Short, focused lessons contain detailed visual aids and videos that reinforce content so you can apply new knowledge directly to your work in the field.

Sawed joints are sealed to prevent the intrusion of water, deicing chemicals, and incompressible materials into the pavement structure which can reduce the pavement’s acceptable performance life. Joint sealing is shown to prevent several types of distresses, including joint associated distress, weakening of the base and subgrade supporting structure, blow ups, and voids beneath the joints and subsequent pavement faulting or pumping. It has also been shown recently that when wide joints are used, sealing joints can reduce the overall tire-pavement interaction noise.

Take this course to learn how to employ successful practices and techniques. Specifically, you will learn the answers to these questions:

Why is the technique an important part of concrete pavement preservation?
What options are available and which options provide the best opportunities for success?
What materials are involved in the techniques?
What are the specific, sequential tasks required to properly perform joint sealing?

Outcomes
Upon completion of the course, participants will be able to:

• Explain what joint or crack sealing is, and when it should be performed;
• List important safety considerations when working on joint sealing projects;
• Explain how to prepare for joint sealing;
• Describe recommended materials and equipment used in joint sealing;
• Describe recommended construction procedures and process steps for joint sealing;
• Describe recommend procedures for repairing cracks;
• List the criteria for determining whether joint sealing results are of sufficient quality; and
• Identify typical problems encountered and how to avoid or resolve these issues.

Target Audience
This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. This training is ideal for construction foreman, workers, and technicians; agency inspectors and construction managers; and engineers.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 3 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-138008

Course Title
Transportation Performance Management (TPM) for Bridges

Starting in 2019, this course will be delivered for free to Metropolitan Planning Organizations and State DOTs. The reduced price is being provided by the FHWA Office of Infrastructure. YOU CAN PREVIEW A SUMMARY OF THIS COURSE BY COPYING AND PASTING THE FOLLOWING URL: https://connectdot.connectsolutions.com/nhi138008executivesummary/

‘Transportation Performance Management for Bridges’ is a one-day Instructor-led Training course offered by NHI, the authoritative source in transportation training.

Moving Ahead for Progress in the 21st Century Act (MAP-21) established, and Fixing America’s Surface Transportation (FAST) continued, new requirements for reporting on national performance measures and making progress toward targets in several national goal areas, including the condition of the bridges on the National Highway System (NHS). This course helps agencies apply Transportation Performance Management (TPM) concepts to implement the bridge-related TPM requirements.

The course begins with an overview of key performance management concepts. It then reviews performance measures defined for assessing and reporting bridge performance. Finally, the course details how to set and report bridge performance targets and assess performance against agency targets.

The main goals of the course are to provide agency staff with the skills and abilities to use the national bridge performance management measures to assess bridge condition, establish bridge performance targets, report bridge performance, and assess progress toward achieving bridge performance targets in compliance with the TPM requirements in 23 CFR 490.

The course is organized in the following lessons:
+ TPM Overview
+ Bridge Performance Management and Related Rules
+ Bridge Performance Data
+ Setting Bridge Performance Targets
+ Reporting, Accountability, and Transparency

The course includes a written assessment. The course was launched in May 2018.

YOU CAN PREVIEW A SUMMARY OF THIS COURSE BY COPYING AND PASTING THE FOLLOWING URL: https://connectdot.connectsolutions.com/nhi138008executivesummary/

To enroll in this Instructor-led Training course, select the ‘View Sessions’ button and select ‘Add To Cart’ next to your session choice. If there are no upcoming sessions, select ‘Sign Up for Session Alerts.’

Any organization can host this course. To host this course and bring training to your organization, click the ‘Host this Course’ button.

Outcomes
Upon completion of the course, participants will be able to:
• Describe the transportation performance management (TPM) requirements related to bridge performance
• Describe the performance-based planning and programming process and asset management process as they apply to bridges
• Identify required bridge performance measures, as well as other common bridge performance measures
• Use and interpret bridge performance data
• Identify key supporting business practices for establishing and assessing progress toward achieving targets
• Establish bridge performance targets using data on existing performance and predicted future funds, deterioration, and investment strategies
• Explain common challenges in establishing bridge performance targets and approaches that can be used to address them
• Describe required process for bridge performance measurement, reporting, and assessment
TARGET AUDIENCE
The target audience for this Instructor-led Training course consists primarily of professionals responsible for collecting, analyzing, and reporting bridge performance data; managing bridge inventories; recommending bridge investment strategies; and setting bridge performance targets. This audience includes bridge managers, asset managers, planners, performance management, and programming staff of State and local agencies, consultants, and FHWA.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 DAYS (CEU: .6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-132010A

COURSE TITLE
Earthquake Engineering Fundamentals (Web-based)

This 4-hour NHI training course 132010A entitled “Earthquake Engineering Fundamentals” is a Web-Based pre-requisite to the 2-day 132094A “LRFD Seismic Analysis and Design of Transportation Geotechnical Features” and 132094B “LRFD Seismic Analysis and Design of Structural Foundations and Earth Retaining Structures” courses. The participants will generally be notified to take the WBT course about 1 month before the ILT sessions and must complete this course before the start of the 132094A or 132094B course. The course consists of 6 lessons including: Earthquake Fundamentals (L1); Intro to LRFD Seismic Design (L2); Earthquake Ground Motions (L3); Seismic Hazard Analysis (L4); AASHTO Design Ground Motion Characterization (L5); and Intro to Geotechnical Hazards (L6).

OUTCOMES
Upon completion of the course, participants will be able to:
- Describe basic earthquake concepts
- Explain basic concepts of LRFD Seismic Design
- Describe earthquake ground motions
- Describe aspects of seismic hazard analysis
- Explain AASHTO design ground motion characterization
- Describe basic aspects of geotechnical hazards

TARGET AUDIENCE
This course is intended to engage a target audience of bridge and geotechnical engineers with zero and up to 20 years of experience that are preparing to attend the 132094A and 132094B Instructor-Led Training courses.

TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 4 HOURS (CEU: .4 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-132010B

COURSE TITLE
Introduction to LRFD for Foundation Design

NHI-132010B Introduction to LRFD for Foundation and Substructure Design is a web-based training (WBT) course covering fundamental and basic principles related to Load and Resistance Factor Design (LRFD) for Highway Bridge Foundations. The course is developed to assist engineers in understanding the transition from Allowable Stress Design (ASD) to LRFD for structural foundations. Topics in this course include basic elements of LRFD development and implementation, principles of limit state design, loads and load combinations, soil and rock properties, and shallow and deep foundation design.

This WBT is designed to be both a stand-alone course that provides introductory information on LRFD for bridge foundations, and a prerequisite for attending NHI-132082 LRFD for Highway Bridge Substructure, a 4 day instructor-led course. NHI-132010B is a recommended prerequisite to NHI-132082 as well as other foundation design courses in the geotechnical curriculum.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the development of LRFD and relationship to AASHTO.
• Identify the LRFD equation, limit states, LRFD design objectives, and foundation materials associated with LRFD.
• List loads, load combinations, and load factors associated with LRFD.
• Categorize soil and rock properties to provide a basis for determination of geotechnical resistance of soil and rock.
• Recognize shallow and deep foundation design by LRFD.

TARGET AUDIENCE
The target audience for NHI-132010B Introduction to LRFD for Foundation Design is individuals responsible for, or involved with, the design and construction of bridge substructures on surface transportation projects. Typically, the individuals will include an audience that is novice to LRFD, but has a background in bridge foundation design on surface transportation facilities such as geotechnical engineers, bridge and transportation engineers, geologists, and managers. This course is intended for those with general knowledge and/or skills with the bridge and/or geotechnical foundation and substructure design who desire to become familiar with LRFD.

TRAINING LEVEL: Basic
FEES: 2022: $50 Per Person; 2023: $0 Per Person
LENGTH: 8 HOURS (CEU: .8 UNITS)
CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132012

Course Title
Soils and Foundations Workshop

This course is geared toward practicing design and construction engineers who routinely deal with soil and foundation problems but have little theoretical background in soil mechanics or foundation engineering. The course takes a project-oriented approach whereby the soils input to a bridge project is followed from conception to completion. In each phase of the project, the soil concepts will be developed into specific foundation designs and recommendations. The classroom presentation includes a variety of exercises to verify achievement of learning objectives. Each participant will take away a comprehensive reference manual on soils and foundations and a participant workbook containing a copy of all slides presented and completed exercises.

NOTE TO PARTICIPANT: All participants should bring calculators that perform trigonometric calculations, a note pad, and a pencil.

NOTE TO HOST: In addition to the typical host requirements of NHI courses, for this course the host is asked to arrange for the state's geotechnical engineering group to conduct a short presentation (usually on the second day of the course) summarizing the administrative and technical procedures followed by the host state.

Outcomes
Upon completion of the course, participants will be able to:

• Identifying the minimum level of geotechnical input in various project phases of a highway project
• Recalling the equipment and procedures used to implement a subsurface investigation of soil and rock conditions
• Demonstrating basic skills in visual description of soils native to the host state
• Recalling geotechnical facilities and personnel in the host state
• Recalling the basic soil test procedures and how the results of the various soil tests are applied results to highway projects
• Listing procedures used for both settlement and stability analysis, and recalling design solutions to stability and settlement problems for approach roadway embankments
• Listing procedures used for determining bearing capacity and settlement of shallow foundations such as spread footings
• Identifying the basic skills needed in the design and construction management of driven pile and drilled shaft foundations
• Recalling the driven pile and drilled shaft foundation construction equipment and construction inspection procedures
• Description static load testing and recalling the basic skills needed to interpret static load test results
• Recalling the basic skills needed in the design and construction of earth retaining structures
• Discussing the format and minimum content of an adequate foundation report

Target Audience
Personnel from the following units at the transportation agency could benefit from this workshop: geotechnical, bridge design, roadway design, materials, construction, and maintenance. The personnel who will benefit the most are the first-line supervisors involved in the design of highway structures and embankments. The greatest impact will be achieved by convincing structural, design, and construction engineers to use procedures from this course as a guide for routine geotechnical work. All attendees should be encouraged to attend the entire course, not just sections that are in their specialty. One of the major benefits of this course is to give engineers an appreciation of activities outside their specialties that influence, or are influenced by, the work of the geotechnical engineer.
**TRAINING LEVEL:** Basic

**FEE:** 2022: $1100 Per Person; 2023: N/A

**LENGTH:** 4 DAYS (CEU: 2.4 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Drilled Shafts

Drilled shafts are an alternate type of deep foundation that may be more cost effective and perform better than other types of deep foundations in bridge piers at river crossings and in retrofit operations, high-mast lighting, earth retaining structures, single-column piers, and similar applications. This course provides participants with specific technical guidance on all aspects of designing, installing, and monitoring the construction of drilled shafts. The lessons address the following topics: applications, advantages, and disadvantages of drilled shafts for transportation structure foundations; general requirements for subsurface investigations; construction methods; construction case histories; construction specifications; principles of designing drilled shafts for axial and lateral loading; expansive soils, downdrag, and similar effects; load testing; inspection; integrity testing; repair and retrofit of defective shafts; and cost estimation. The participants will receive a comprehensive reference manual on drilled shaft construction and design used by engineers who perform detailed designs of drilled shafts, write construction specifications, and evaluate the performance of contractors through a comprehensive inspection program.

Outcomes

Upon completion of the course, participants will be able to:

• Describe the various drilling rigs and tools that are available to construct drilled shafts under varied subsurface soil and rock conditions
• Recognize the basic features of drilling aids, such as casings and drilling slurries, and the reasons for certain fundamental requirements for these aids
• Design drilled shafts for axial loading in simple soil and rock profiles
• Demonstrate a general understanding of the elements of designing drilled shafts for lateral loads
• Demonstrate an understanding of the need for load tests and available methods for performing the tests
• Formulate the basic elements of construction specifications for drilled shafts
• Demonstrate an understanding of integrity testing, repair, and retrofit of defective shafts
• Estimate costs for drilled shafts

Target Audience

The target audience for this course includes geotechnical engineers, bridge designers, and resident engineers. The course embraces both construction and design, and it is important that all participants attend all lessons, not just those in their immediate areas of interest. A key issue is how the details of construction affect the way in which a drilled shaft should be designed and how the intent of the design affects inspection. Participants are expected to have a degree in engineering for which they have passed an undergraduate course in soil mechanics and/or have successfully completed NHI course FHWA-NHI-132012 Soils and Foundations Workshop.

Training Level: Intermediate

Fee: 2022: $950 Per Person; 2023: $980 Per Person

Length: 3 DAYS (CEU: 1.6 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-132033

COURSE TITLE
Soil Slope and Embankment Design and Construction

This course covers important aspects associated with the design and construction of soil slopes and embankments. It is intended to provide transportation earthwork professionals with knowledge to recognize potential problems with soil slope/embankment stability and deformation in transportation projects. Participants will develop the skills necessary to design and evaluate soil slopes and embankments and learn about the implications for construction and inspections. The course embraces both design and construction.

Participants will receive a comprehensive reference manual, used by practicing highway and geotechnical engineers covering investigation, design, construction, and mitigation of soil slopes and embankments. The participant workbook contains copies of visual aids and student exercises that closely follow the PowerPoint slide presentations. The participant exercises promote interaction in the classroom and illustrate the basic principles and analyses.

OUTCOMES
Upon completion of the course, participants will be able to:

• Recognize potential failure modes or deformation types for soil slopes and embankments
• Identify the potential failure modes for soil slopes and the type of analysis required to evaluate stability of the slope
• Determine the stability of a slope using slope stability charts
• Recognize the major design consideration for embankments constructed using earth fill, rock fill, and lightweight fill
• List the steps necessary for designing an embankment over compressible foundation soil
• List the common causes/triggering mechanisms for landslides/slope instabilities
• List appropriate stabilization methods

TARGET AUDIENCE
The target audience is bridge, geotechnical, or transportation engineers with 0 to 20 years of experience and responsible for the design, analysis, and construction maintenance or remediation of soil slopes and embankments on surface transportation facilities.

TRAINING LEVEL: Intermediate

FEE: 2022: $800 Per Person; 2023: $850 Per Person
LENGTH: 2.5 DAYS (CEU: 1.5 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132034

Course Title
Ground Modification Methods

Ground Modification Methods is a practical training course that provides participants the knowledge and ability to effectively implement the latest ground modification methods and procedures used in connection with transportation related construction.

The course content includes information on the description, history, functions, and categories of ground modification methods; a description of the web-based GeoTechTools technology selection and guidance system, and geotechnology catalog; and a series of stand-alone technical chapters on ground modification method categories. Each category chapter contains lessons that outline the current practice in design, construction methods and materials, design concepts, costs, and contracting methods and specifications.

The overall goal of Ground Modification Methods is to introduce agencies to state of the practice design tools and construction methods on available ground modification methods to design specialists, generalists, and construction engineers involved in projects with problematic site conditions.

Outcomes
Upon completion of the course, participants will be able to:

• List the categories and functions of ground modification methods and techniques.
• Locate criteria to determine the applicability of each ground modification method discussed for a specific project under consideration.
• Describe advantages, disadvantages, and limitations for each ground modification method discussed.
• Describe how GeoTechTools can be used to identify potential applications for ground modification methods for use in transportation facilities.
• Locate and identify required soil and rock properties necessary to perform preliminary design.
• Prepare conceptual and basic designs, and evaluate contractor submitted designs.
• Identify appropriate quality assurance methods for various ground modification methods.
• Summarize key elements of a preferred contracting method.

Target Audience
The primary target audience is agency and consultant bridge/structures, geotechnical, and roadway design engineers; engineering geologists; and consultant review specialists. Additionally, management, specification and contracting specialists, and construction engineers interested in the design and contracting of ground modification methods are encouraged to attend. All attendees should have a basic knowledge of geotechnical engineering. Attainment of an undergraduate degree in civil engineering, geology, or equivalent engineering experience in the highway/transportation field is preferred.

Training Level: Intermediate

Fee: 2022: $1050 Per Person; 2023: $1050 Per Person

Length: 3.5 Days (CEU: 2.1 Units)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-132035

COURSE TITLE
Rock Slopes

This course presents geological investigation techniques, shear strength theories for determining rock strength, and design methods for rock slopes with different failure mechanisms. Other topics include rock blasting, rock slope stabilization methods, and contracting issues. Classroom instruction includes the discussion of sample problems and case histories involving rock slope analyses and designs.

Participants will receive a comprehensive reference manual (FHWA-NHI-99-007) and the accompanying exercises (FHWA-NHI-99-036). The reference manual covers investigation, design, and construction of rock slopes for highway/geotechnical engineers. It is geared towards practicing engineers who are involved with rock slope design and stabilization, but may not have the complete theoretical background. The exercises (FHWA-NHI-99-036) are designed to promote interaction in the classroom and to illustrate the basic principles and analyses. Solutions are included with each exercise.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the basic principles of rock slope design
• Plan and execute a geological investigation, including geologic mapping
• Perform appropriate in situ and laboratory strength tests
• Determine rational design parameters by proper evaluation of in situ and laboratory test data along with appropriate rock strength correlations
• Identify the failure mechanisms associated with rock slopes and apply appropriate design methodologies
• Design effective rockfall protection and slope stabilization measures
• Design a monitoring program for cut slopes

TARGET AUDIENCE
The target audience for this course includes FHWA, State, and local highway agency employees; college and university faculty; and consultant engineers/geologists who are or will be involved in the design, excavation, and stabilization of rock slopes. An undergraduate degree in geology, engineering geology, civil engineering, or equivalent engineering experience in the highway/transportation field is desirable.

TRAINING LEVEL: Intermediate

FEE: 2022: $725 Per Person; 2023: $725 Per Person

LENGTH: 2 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-132036

COURSE TITLE
Earth Retaining Structures

The goal of this course is to provide agencies with state-of-the-practice design tools and construction techniques to expand implementation of safe and cost-effective earth retention technologies. This course addresses the selection, design, construction, and performance of earth retaining structures used for support of fills and excavations or cut slopes. Instructors cover factors that affect wall selection, including contracting approaches with an emphasis on required bidding documents for each approach. Class discussions will include design procedures and case histories, demonstrating the selection, design, and performance of various earth retaining structures. Detailed information on subsurface investigation, soil and rock property design parameter selection, lateral earth pressures for wall system design, and load and resistance factor design (LRFD) for retaining walls are provided.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe potential applications for Earth Retaining Structures (ERS)
• Select a technically appropriate and cost-effective ERS
• Select appropriate material properties, soil design parameters, and earth pressure diagrams
• Perform design analysis and prepare conceptual designs
• Review contractor submitted documents
• Discuss contracting methods
• Describe construction and inspection activities for ERS

TARGET AUDIENCE
The primary audience for this course is agency and consultant bridge/structures, geotechnical, and roadway design engineers; engineering geologists; and consultant review specialists. In addition, management, specification, and contracting specialists and construction engineers involved in design and contracting aspects of retaining structures are encouraged to attend. Attendees should have a basic knowledge of soil mechanics and structural engineering, including some understanding of LRFD concepts.

TRAINING LEVEL: Intermediate

FEE: 2022: $950 Per Person; 2023: $950 Per Person
LENGTH: 3 DAYS (CEU: 1.8 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132040

Course Title
Geotechnical Aspects of Pavements

This course covers the latest methods and procedures to address the geotechnical issues in pavement design, construction, and performance for new construction, reconstruction, and rehabilitation pavement projects. The course content includes geotechnical exploration and characterization of in-place and constructed subgrades; design and construction of subgrades and unbound layers for paved and unpaved roads, with emphasis on the American Association of State Highway Transportation Officials (AASHTO) 1993 empirical design procedure and on the new Mechanistic-Empirical Pavement Design Guide (MEPDG); drainage of bases, subbases, and subgrades and its impact on providing safe, cost-effective, and durable pavements; problematic soils, soil improvement, stabilization, and other detailed geotechnical issues in pavement design and construction; and construction methods, specifications, and QC/QA (quality control/quality assurance) inspection for pavement projects.

The goal of the course is for each participant to recognize the importance of the geotechnical aspects relevant to the design, construction, and performance of a pavement system. Participants will develop an appreciation for the importance of adequate subsurface exploration and laboratory characterization of subgrade soils as well as the requisite pavement design parameters for subgrades, unbound base and subbase layers, including drainage features. The course is designed to elicit maximum input from participants, particularly regarding an understanding of the impact of geotechnical features on the long-term performance of pavement systems.

NOTE TO PARTICIPANT: Please bring a calculator that can perform trigonometric, log, and other engineering calculations, a note pad, and a pencil.

NOTE TO HOST: For this course, the host is asked to identify a state speaker to conduct a host state presentation. The presentation is usually on the first day of the class and lasts approximately 25 minutes with an additional 15 minutes of discussion. The objective of the presentation is to communicate the state’s current practices and experience to the course participants. The state representative should have experience in geotechnical pavement activities. A detailed list of issues to be addressed in the host presentation will be provided. Also for this course, the host is asked to secure at least 6 laptop computers to be used during team exercises. The host can request that at least 6 participants bring their laptops to the course. The machines must have Microsoft Excel (Office 97 or later) and the optional Solver add-in tool installed. Lastly, the host state is asked to complete a “Questionnaire on Geotechnical Practices in Pavement Design” and provide policies and special provisions for (1) obtaining subsurface information and laboratory testing in relation to pavement design, (2) pavement design along with any agency design guides, (3) field construction monitoring for subgrade approval and pavement component approval as well as contractors QC requirements for pavement component construction.

Outcomes

Upon completion of the course, participants will be able to:

• Explain the geotechnical parameters of interest in pavement design and their effects on the performance of different types of pavements
• Explain the influence of climate, moisture, and drainage on pavement performance
• Identify and explain the impact of unsuitable subgrades on pavement performance
• Determine the geotechnical inputs needed for design of pavements, both for the AASHTO 93 empirical design procedure and the new MEPDG
• Evaluate and select appropriate remediation measures for pavement subgrades
• Explain the geotechnical aspects of construction specifications and inspection requirements
• Identify subgrade problems during construction and develop recommended solutions

Target Audience

Many groups within an agency are involved with different aspects of definition, design, use, and construction verification of pavement geomaterials. These groups include pavement design engineers, geotechnical engineers, materials engineers, specification writers, and construction engineers who are or will be involved in the design, evaluation, and construction (or reconstruction or rehabilitation) of pavements. This course was developed as a forum for these various personnel to work together to enhance current procedures for building and maintaining more cost-efficient pavement.
structures.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $950 Per Person; 2023: $950 Per Person

**LENGTH:** 3 DAYS (CEU: 1.8 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132042

Course Title
Design of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes

Mechanically stabilized earth walls (MSEWs) are commonly used on roadway projects and are typically cost effective and aesthetically pleasing. The basic concept behind MSEWs is to combine soil, reinforcing materials made of steel or polymers, and appropriate facing to produce a composite system with engineering properties that are ideal for most roadway applications. Reinforced soil slopes (RSS) utilize the same types of reinforcement for the construction of steep embankments. Both MSEWs and RSS structures can provide substantial savings in construction time and costs when compared with other types of earth retaining systems.

The goal of the course is to educate agencies about state-of-the-practice design tools. This includes comprehensive instruction on the design of MSEWs using load resistance factor design (LRFD). The course also presents construction practices to promote implementation of mechanically stabilized earth technology in cost effective earth retention structures. This course would most benefit persons who are involved in the design and construction of earth retention structures for surface transportation projects.

NOTE TO PARTICIPANT: Please bring a calculator that performs trigonometric calculations, a note pad, and a pencil.

NOTE TO HOST: In addition to the typical host requirements of NHI courses, for this course the host state technical contact is asked to bring 30 copies of the standard MSE wall and the RSS specifications (or special provisions), a complete set of applicable state DOT state construction specifications, standard plates, standard details, inspection guidelines, etc. pertaining to earth retaining structures. Copies should be forwarded to the instructors a month before the course. The host agency is also asked to provide approximately 20-25 pounds of dry sand. About 1/2 bag of “play” sand from a hardware store will suffice.

Outcomes
Upon completion of the course, participants will be able to:

• Recognize potential applications for MSEWs and RSS structures in transportation facilities
• Prepare conceptual and basic (i.e., for simple geometry) designs, and be able to check contractor-submitted designs for walls and slopes
• Examine and select appropriate material properties and parameters used in design
• Calculate the cost of conceptual MSEWs and RSS structures and determine if construction is a cost-effective option
• Select appropriate specification/contracting method(s) and prepare detailed specifications for materials and methods of construction
• Define and communicate major components of construction inspection of MSEWs and RSS structures to confirm compliance with design

Target Audience
The primary audience for this course is agency and consultant bridge/structures, geotechnical, and roadway design engineers; engineering geologists; and consultant review specialists. In addition, management, specification and contracting specialists, and construction engineers interested in design and contracting aspects of MSEWs and RSS structures are encouraged to attend. Attendees should have a basic knowledge of soil mechanics and structural engineering. (Note that NHI offers a 1-day course, FHWA-NHI-132043 Construction of MSEW and RSS.)

Training Level: Intermediate

Fee: 2022: $950 Per Person; 2023: $1050 Per Person

Length: 3 DAYS (CEU: 1.8 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-132043

COURSE TITLE
Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes

This course presents the concepts of mechanically stabilized earth wall (MSEW) and reinforced soil slope (RSS) systems and their application to roadways. The construction materials for both systems are described and guidance on acceptance for use is given. MSEW and RSS system construction steps are taught and typical construction practices and techniques are presented.

OUTCOMES
Upon completion of the course, participants will be able to:

• Recognize potential applications for MSEWs and RSS structures in transportation facilities
• Recognize differences between available systems and their components
• Understand the intent of specification/contracting method(s)
• Define and communicate major components of construction inspection of MSEWs and RSS structures to confirm compliance with design
• Understand the steps for MSEW and RSS construction and the corresponding points for inspection

TARGET AUDIENCE
The primary audience for this course is agency and consultant construction engineers, inspectors, and technicians. In addition, management; specification and contracting specialists; bridge/structures, geotechnical, and roadway design engineers; and engineering geologists interested in construction aspects of MSEWs and RSS structures are encouraged to attend. Attendees should have a basic knowledge of soil mechanics and structural engineering. (Note that NHI offers a 3-day course, FHWA-NHI-132042 Design of MSEWs and RSSs and a 3-day course, FHWA-NHI-132080 Inspection of MSEWs and RSSs.)

TRAINING LEVEL: Intermediate

FEE: 2022: $500 Per Person; 2023: $500 Per Person

LENGTH: 1 DAYS (CEU: .6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 35

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132069

Course Title
Driven Pile Foundation Inspection

This course provides Federal, State, and local inspectors with practical knowledge and standard industry practices for inspecting pile-driving operations at transportation construction sites.

To establish a national standard for transportation personnel, NHI developed the course based on a number of Federal and State sources: the course materials from the Florida Department of Transportation's Pile Driving Inspector's Qualification test, AASHTO's 2000 Bridge Construction Specifications, and the NHI courses Driven Pile Foundations - Design and Construction (FHWA-NHI-132021) and Driven Pile Foundations - Construction Monitoring (FHWA-NHI-132022). However, the local specifications, inspection reports, and plan sheets available from the hosting agency also will be discussed. The course includes a 3-hour qualification examination.

Outcomes
Upon completion of the course, participants will be able to:

• Explain the inspector’s role, duties, and responsibilities
• Describe the pile-driving system components
• Recognize key inspection elements of the contract documents
• Identify proper communication and coordination with the engineer and contractor
• Identify the key elements of a pile installation plan
• Recognize and identify pile-driving system components and tools
• Verify tip elevations, cutoff elevations, pile penetration, and length driven for vertical and battered piles
• Perform inspection of pile-driving operations and verify compliance with construction tolerances
• Recognize when to stop driving based upon provided driving criteria, minimum tip or penetration, and refusal guidelines.
• Verify pile condition, labeling, and marking for compliance
• Recognize and explain the difference between test piles and production piles and the various types of pile testing
• Identify “driving” irregularities
• Identify and document pay quantities
• Interpret and apply applicable AASHTO specifications relating to foundation acceptance
• List potential problems and safety issues

Target Audience
The target audience for this course includes those who inspect pile-driving operations during construction of foundations and major structures. In addition, project management and construction engineers in charge of pile-driving construction inspections are encouraged to attend. Attendees should have completed courses in basic courses in reading construction plans as well as construction math and high school algebra.

Training Level: Intermediate

Fee: 2022: $800 Per Person; 2023: $850 Per Person

Length: 2.5 DAYS (CEU: 1.5 UNITS)

Class Size: Minimum: 20; Maximum: 35

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132070

Course Title
Drilled Shaft Foundation Inspection

Drilled Shaft Foundation Inspection is a stand-alone course developed to provide a basis for local, regional, or national qualification of drilled shaft foundation inspectors. The goal of this course is to provide inspectors with practical knowledge and standard industry practices for the inspection of drilled shaft foundation construction. A 2-hour qualification exam is administered on the third day of the course.

The course follows recommended FHWA specifications and practices for drilled shaft construction but may be modified to follow local agency specifications and practices.

NOTE TO PARTICIPANT: All participants should be advised by the local coordinator/session host that they are encouraged to complete NHI 132070B Drilled Shaft Inspector Tutorial (WBT). All participants should also be advised to bring a calculator that performs basic math, in particular works with negative numbers, a built in Pi function, and square root functions.

NOTE TO HOST: This course requires participation of a host agency technical representative. The objective of the host agency technical representative is to communicate the state’s or region’s current practices and experience to the course participants. The technical representative is asked to provide the instructor with a complete set of applicable state DOT construction specifications, standard plates, standard details, set of typical plans including boring sheets, a technical special provision, inspection guidelines and state standard Drilled Shaft Inspection Reporting and Recording forms. Also, the host agency is asked to provide seven duplicate sets of local soil and rock samples, one rock core, one set of rock cuttings, a full set of slurry testing equipment, a variety of spacers and standoffs used locally, and thirty sets of typical plans.

Outcomes
Upon completion of the course, participants will be able to:

• Identify and understand the role and duties of the inspector
• Recognize key inspection elements of the contract documents
• Identify proper communication and coordination with the engineer and contractor
• Interpret and verify contractor compliance with items in the drilled shaft installation plan
• Recognize and identify drilled shaft construction equipment and tools
• Perform visual field verification of soil/rock material for comparison to supplied soil boring data/logs
• Calculate percent recovery and rock quality designation (RQD)
• Recognize and identify the various types of drilled shaft construction
• Perform inspection of drilled shaft excavations for compliance with plans, construction tolerances, and cleanliness
• Verify reinforcing cage construction compliance including side spacers and cross-hole sonic logging (CSL) tubes
• Determine concrete volumes for theoretical shafts and develop concrete curves
• Identify shaft “concreting” irregularities
• Perform calculations for volume, area, circumference, and elevation
• Locate, explain, and apply applicable FHWA, AASHTO, and State DOT specifications relating to compliance

Target Audience
The target audience for this course includes agency and consultant personnel who inspect foundations or major structures. In addition, project management and construction engineers in charge of drilled shaft construction inspection are encouraged to attend. This course is designed to be most beneficial to foundation inspectors who are responsible for inspecting drilled shafts during construction.
Training Level: Intermediate

Fee: 2022: $900 Per Person; 2023: $900 Per Person

Length: 2.5 Days (CEU: 1.5 Units)

Class Size: Minimum: 20; Maximum: 35

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132070B

Course Title
Drilled Shaft Inspector Tutorial - WEB-BASED

This training is a prerequisite of another NHI training and is offered at no cost.

132070B Drilled Shaft Inspector Tutorial provides training on the fundamental concepts of drilled shafts construction for those involved in the inspection of drilled shafts. This 4-hour Web-based training (WBT) includes the following topics related to drilled shafts: foundations drilled shaft types, methods of construction, construction equipment, and tools. 132070B was developed as a companion training aid for the Instructor-led training 132070 Drilled Shaft Foundation Inspection course. This course replaces 132070A and it is recommended that this WBT be completed prior to attending 132070 Drilled Shaft Foundation Inspection.

This course details the work of the inspector prior, during and after completion of the drilled shaft construction process. Areas of focus include: the inspector's roles, functions, responsibilities, and levels of involvement at different phases of construction. The drilled shaft construction process is covered from the inspector's viewpoint with regards to the documents and tools required for inspection, including equipment and site required checks. Also highlighted is the inspector's role during the drilled shaft excavation process; the rebar cage fabrication and positioning process; and during the placement of concrete. Theoretical and actual drilled shaft concrete volumes calculation, post installation, load, and integrity tests, and other types of tests are also addressed in this course. 132070B details the steps in the drilled shaft construction process and identifies specific responsibilities and methods that will assist inspectors in safely achieving project goals.

Outcomes
Upon completion of the course, participants will be able to:

• Describe the inspector's duties and responsibilities during drilled shaft construction
• Explain the inspector's role in the drilled shaft construction process
• Identify different construction methods
• List equipment and tools used by the inspector and at a drilled shaft construction site
• List the steps in the drilled shaft construction process
• Identify specific responsibilities and methods to assist the inspector in achieving their goal

Target Audience
Federal, State, and local highway agency employees and consultant personnel who inspect foundations or major structures, as well as project managers and construction engineers responsible for drilled shaft construction inspection may benefit from this course.

Training Level: Intermediate

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 4 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-132078

COURSE TITLE
Micropile Design and Construction

The primary goal of this course is to provide the target audience with guidance on when and where it is appropriate to use micropiles, and educate engineers about the state of the practice in the design and construction of micropiles. The course covers stepwise procedures for the design of micropiles for structural support and for slope stability applications. Construction, inspection and integrity-testing aspects and issues are discussed as well. Classroom presentations include exercises that will lead participants through the technical and cost feasibility aspects of structural support and slope stability design with micropiles. Each participant will receive a workbook and reference manual containing detailed micropile design examples for various applications.

FHWA-NHI-132012 Soils and Foundations course is a recommended prerequisite.

OUTCOMES
Upon completion of the course, participants will be able to:

- Briefly describe the history and current status of the micropile industry
- Identify potential micropile applications
- Explain construction constraints, techniques, and performance
- Assess feasibility of micropiles for a given application
- Prepare conceptual and basic designs, and evaluate contractor-submitted designs
- Select appropriate specification/contracting method(s) and prepare contract documents
- Describe construction monitoring and inspection requirements

TARGET AUDIENCE
This course is directed toward practicing geotechnical, foundation, construction and bridge/structural engineers who have knowledge and experience in the design and construction of driven piles and drilled shaft foundations. Engineers involved with the design and construction of structure foundations will all benefit from this training, which builds upon the basic concepts presented in NHI courses FHWA-NHI-132012, FHWA-NHI-132014, and FHWA-NHI-132021.

TRAINING LEVEL: Intermediate

FEE: 2022: $750 Per Person; 2023: $750 Per Person

LENGTH: 2 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-132079

COURSE TITLE
Subsurface Investigation Qualification

This course is part of a series to develop a training and qualification/certification program for geotechnical inspectors and field personnel. The course follows FHWA guidelines and practices for subsurface investigations. Topics addressed in the course include exploration equipment and methods, safety, borehole sealing, drilling and sampling requirements and criteria, proper visual classification and description of soils and rocks, common drilling errors, and dealing with difficult subsurface site conditions. A 2-hour qualification exam is administered at the end of the course.

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain the investigation specialist's general role and duties, as well as the importance of coordination and communication with the field personnel and engineers
• Explain the purpose of geotechnical subsurface investigations and why adequate, consistent, and quality investigations are essential
• Identify the major components of the typical subsurface investigation plan
• Identify common drilling rigs, uses, and components
• Explain the importance of accurate borehole logging and documentation
• Describe the importance of accurate groundwater investigations
• Discuss safety issues involving operation of a drill rig

TARGET AUDIENCE
The target audience for this course includes drillers, drilling inspectors, engineers, geologists, and technicians involved in field data collection and quality assurance of subsurface investigations.

TRAINING LEVEL: Intermediate

FEE: 2022: $950 Per Person; 2023: $975 Per Person

LENGTH: 3 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 35

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-132081

COURSE TITLE
Highway Slope Maintenance and Slide Restoration

As focus changes toward the asset management of our existing infrastructure, the value of maintaining and managing our embankment and cut slopes becomes more apparent. This course provides the essentials to slope maintenance and slide restoration for transportation field personnel with an asset management perspective. This course is not meant to be highly technical, and explains, conceptually and in layman’s terms, the conditions and factors affecting slope movement, stability and deterioration, and the cost considerations of maintenance, stabilization and of slope failures. The course also provides the fundamental aspects of slope management systems and discusses the rationale of slope management considering the legal implications of slope failures and rock fall.

OUTCOMES
Upon completion of the course, participants will be able to:
- Discuss common soil and rock slope movement and instability
- Describe common factors and conditions under which slopes deteriorate and become less stable
- Describe the affects of earth material properties on slope stability
- Discuss the influences of water on slope stability
- Identify failure-prone conditions
- Describe the importance of necessary communication and coordination with geotechnical specialists
- Discuss best maintenance practices
- Discuss methods of slope monitoring
- Describe key components of slope management systems
- Recognize common soil and rock slope stabilization techniques
- Compare cost differences between preventative measures for slope maintenance and slide restoration and costs associated with slope failures
- Discuss legal implications of slope failures, rock fall and management systems

TARGET AUDIENCE
The target audience for this course includes a wide range of transportation personnel consisting of Federal, State and local maintenance, geotechnical, operations and asset management engineers, geologists, managers, supervisors and personnel involved in assessing, maintaining, managing and repairing cut-slopes, fill-slopes and associated features. Although the potential audience of this course is wide-ranging, the course is primarily provided for the State maintenance specialists.

TRAINING LEVEL: Basic

FEE: 2022: $700 Per Person; 2023: $850 Per Person

LENGTH: 2.5 DAYS (CEU: 1.5 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 35

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-132084

COURSE TITLE
Geotechnical Subsurface Exploration - WEB-BASED

The Subsurface Explorations Web-based Training course will provide transportation engineers with a basic knowledge and understanding of subsurface exploration programs for design and construction of structure foundations, walls, and other geotechnical features. Properly conducted subsurface exploration programs are an essential part of geotechnical engineering, and are a critical step in understanding soil and rock properties necessary for design.

The course covers a range of topics related to subsurface exploration programs including earth materials, subsurface conditions, geophysical methods, drilling methods and equipment, soil and rock sampling methods, in-situ testing, and groundwater investigation. Upon completion of this course, participants will be able to apply basic geotechnical engineering principles and sound geotechnical methods to transportation projects.

OUTCOMES
Upon completion of the course, participants will be able to:
• Identify the key geotechnical considerations associated with typical transportation projects
• Describe the recommended process for characterizing subsurface conditions
• Identify the primary types of geophysical methods
• Identify types of drilling methods and equipment
• Identify types of soil and rock sampling methods
• Explain the purpose of in-situ tests and energy-efficiency parameters
• Explain the purpose of doing a groundwater investigation
• Describe minimum guidelines for the geotechnical investigation of both roadway and structure sites

TARGET AUDIENCE
The course is intended for transportation engineers and geotechnical specialists who are involved with the planning, design, and construction of surface transportation facilities. The course will be oriented toward those professionals who routinely deal with soils and foundations issues but who may have little theoretical background in soil mechanics or foundation engineering.

TRAINING LEVEL: Basic

FEE: 2022: $50 Per Person; 2023: $0 Per Person

LENGTH: 6 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132085

Course Title
Soil Nail Walls

Soil Nail Walls is a practical training course that provides civil engineers with the knowledge and ability to utilize design tools and construction methods for the safe and cost effective design of soil nail walls. The lessons present information on the analysis, design, and construction of permanent soil nail walls in highway applications, and introduces a framework that takes into account factors of safety in ASD while integrating LRFD principles. The goal of the course is to provide participants with state of the practice methods and guidelines to expand implementation of safe and cost effective soil nail technology and to help Owners identify and manage the risks associated with soil nail wall projects. The course provides technical guidance on applications and feasibility, construction materials and methods, information required for design, analysis and design of soil nail walls, corrosion protection, and contracting and specifications. Instruction is interactive, with participants actively involved in the learning experience.

Outcomes

Upon completion of the course, participants will be able to:

• Identify potential applications for Soil Nail Walls (SNWs) for use in transportation facilities.
• Describe the load transfer mechanisms for SNWs.
• Select appropriate material properties and nail bond strength parameters used in design.
• Apply LRFD concepts to design of SNWs.
• Prepare conceptual and basic (i.e., simple geometries) designs.
• Compare and contrast state SNW application to the standard of practice.
• Define major components of construction quality assurance (QA), requirements for SNWs, to confirm compliance with design and confirm performance.

Target Audience

The primary target audience is agency and consultant bridge/structures, geotechnical, and roadway design engineers; engineering geologists; and consultant review specialists. Additionally, management, specification and contracting specialists, and construction engineers interested in design and contracting of Soil Nail Walls are encouraged to attend. All attendees should have a basic knowledge of soil mechanics and structural engineering.

Training Level: Intermediate

Fee: 2022: $800 Per Person; 2023: $800 Per Person

Length: 2 DAYS (CEU: 1.2 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132091

Course Title
Earthwork Series: Grades and Grading - WEB-BASED

This course is designed to prepare technical front-line workers for what they can expect to see during actual project inspection. Topics covered include an overview of the plans that pertain to earthwork and earthwork quantities, grade stakes that will be encountered and their meanings, how Global Positioning System (GPS) works and its functions in the field, and verifying and documenting grade information. This course is primarily intended for inspectors and technicians.

The introductory lesson covers an overview of the plan sheets that deal with earthwork and earthwork quantities, topographical images and their meaning, stationing and control points, and profile/section sheets. The second section covers the typical grade stakes used throughout a project and their meaning. The GPS section discusses the history of GPS in construction and how it relates to current projects. And the final section covers how to verify the grade and what information is needed in the documentation from the inspector.

This course provides the front-line technical inspector with the proper tools to assure that the project is built on a stable platform.

Outcomes
Upon completion of the course, participants will be able to:
• Describe the process of plan reading
• Identify the purpose of grade stakes
• Explain how Global Positioning System (GPS) works
• Describe requirements for grade verification and documentation

Target Audience
This training is designed for intermediate to advanced technicians who perform site preparation inspection on earthwork projects. The training was developed by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI and is recommended for TCCC levels II through IV.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 3.5 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132092

Course Title
Earthwork Series: Excavation - WEB-BASED

Excavations of soil and rock are an integral part of highway construction due to the associated costs, safety concerns, engineering considerations, and short and long-term performance expectations. The Earthwork Series: Excavation course is an overview of the basic principles related to the requirements for proper excavation during a project.

This training consists of four modules, which cover the equipment used to excavate soils, and the procedures, requirements, and special considerations for mass excavation, permanent cut slopes, and temporary trench excavations. The course also covers some common problems and safety concerns associated with excavation.

Outcomes
Upon completion of the course, participants will be able to:
• Explain considerations and requirements for excavation
• Recall excavation safety procedures
• Relate common issues and solutions associated with excavation

Target Audience
This training is designed for state and local government employees, as well as private industry technicians and inspectors who work within or around excavations, are responsible for documenting excavation operations, or are responsible for verifying foundation materials and proper earthwork construction on highway projects. The course is a beneficial overview for all those working on an earthwork project, but intermediate and advanced technicians and inspectors are the primary target audience. This training was developed by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI and is recommended for TCCC Levels II through IV.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 4.5 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132093

Course Title
Earthwork Series: Fill Placement - WEB-BASED

Embankment construction; structural and utility bedding and backfilling; and the construction of drainage and filter systems are fundamental examples of highway earthwork - where the control of the material and how it is placed significantly influences engineering performance. The Earthwork Series: Fill Placement course is an overview of the basic applications where fill materials are to be used, and some common problems and safety considerations that you will need to know.

This training consists of four modules which cover culvert bedding and backfill, drainage filters and fabrics, embankment construction, key-ways, and benching. The course discusses material and placement requirements, methods used to control and assure placement, special construction considerations, common problems, and safety related issues.

Outcomes
Upon completion of the course, participants will be able to:
• Explain fill placement;
• Recall fill placement safety procedures; and
• Identify steps for addressing obstacles associated with fill placement.

Target Audience
This training is designed for State and local government employees as well as private industry technicians and inspectors who provide quality control/quality assurance testing, document fill placement activities, verify that earthwork has been constructed according to contract documents, or inspect earthwork activities on highway projects. The course is a beneficial overview for all those working on an earthwork project, but intermediate and advanced technicians and inspectors are the primary target audience. This training was developed by the Transportation Curriculum Coordination Council (TCCC) in partnership with AASHTO NHI and is recommended for TCCC Levels II through IV.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 5.5 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132094

Course Title
LRFD Seismic Analysis and Design of Transportation Structures, Features, and Foundations

This course is a comprehensive and practical training course for analysis and design of transportation geotechnical features including soil and rock slopes, earth embankments, retaining walls, MSE walls, and buried structures; and bridge structural foundations including shallow and deep foundations, and abutment walls. It is developed in consideration of the requirements and recommendations of the seismic provisions in both the 2009 AASHTO LRFD Bridge Design Specifications and the AASHTO Guide Specifications for LRFD Seismic Bridge Design, the Final Report from NCHRP Project 12-70 “Seismic Analysis and Design of Retaining Walls, Buried Structures, Slopes, and Embankments”, and 2006 FHWA Seismic Retrofitting Manual for Highway Structures.

In addition, the course reviews the fundamental principles including engineering seismology, earthquake hazard analysis, site characterization, ground motion characterization, and site response analysis, and highlight updated topics such as the 1000-yr USGS hazard map; updated AASHTO site classes/factors and spectral shapes; the “3-Point” Design Spectrum Construction method; derivation of the relative displacement spectrum; and regional differences in ground motion characteristics (i.e. western US (WUS) characteristics versus central and eastern US (CEUS). It addresses geotechnical hazards which can adversely impact bridges and other transportation structures and features during seismic event including slope instability, soil liquefaction, ground settlement, and fault Rupture. Liquefaction-induced lateral spread failures are also addressed.

Outcomes
Upon completion of the course, participants will be able to:

• Recognize sources of primary and secondary damage due to earthquakes
• Describe the AASHTO seismic design philosophy
• Describe the input for a seismic hazard analysis and interpret the output for a bedrock site condition
• Develop an AASHTO acceleration response spectra and adjust it for local site conditions
• Estimate the residual undrained shearing resistance of liquefied sand
• Develop the input for an equivalent linear seismic site response analysis
• Determine the appropriate seismic coefficient for a pseudo static slope stability analysis and calculate the permanent seismic displacement of an unstable soil slope
• Evaluate the potential for liquefaction triggering and consequences
• Identify potential mitigation measures for slope instability, liquefaction and lateral spreading
• Evaluate external stability of gravity and semi-gravity walls subject to seismic loading
• Discuss types of soil-foundation-structure interaction and how its effects are modeled
• Evaluate the geotechnical and structural capacity of a spread footing
• Identify the primary capacity considerations for deep foundations under seismic loading
• Develop the abutment spring stiffness relationship

Target Audience
This course is intended to engage a target audience of bridge and geotechnical engineers with zero and up to 20 years of experience through instructor-led presentations, discussions, Q&A, group activities, walkthrough examples, hands-on student exercises, and demonstrations.
Training Level: Basic

Fee: 2022: $1350 Per Person; 2023: N/A

Length: 5 DAYS (CEU: 3 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-132094A

COURSE TITLE
LRFD Seismic Analysis and Design of Transportation Geotechnical Features

The Instructor-Led 132094A Course has a prerequisite Web-Based Training (WBT), NHI-132010A Earthquake Engineering Fundamentals, that participants must complete before the start of the 132094A course. The WBT prerequisite course consists of 6 lessons including: Earthquake Fundamentals (L1); Intro to LRFD Seismic Design (L2); Earthquake Ground Motions (L3); Seismic Hazard Analysis (L4); AASHTO Design Ground Motion Characterization (L5); and Intro to Geotechnical Hazards (L6).

This 2-day NHI training course 132094A entitled “LRFD Seismic Analysis and Design of Transportation Geotechnical Features” is a shortened version of the NHI training course 132094 “LRFD Seismic Design of Transportation Geotechnical Features and Structural Foundations” focusing specifically on the geotechnical earthquake engineering aspects. It is a comprehensive and practical training course that addresses seismic analysis and design of transportation geotechnical features including ground motion characterization, development of the AASHTO acceleration response spectrum for structural design using the 1000-yr USGS hazard map for reference site conditions, and evaluation of AASHTO site class and application of AASHTO soil factors to account for local soil conditions; site characterization for geotechnical seismic analysis, equivalent linear site response analysis; identification of geotechnical seismic hazards; seismic stability and deformation analysis of embankments and slopes; analysis procedures for liquefaction and liquefaction-induced lateral spread or flow failures; seismic settlement analysis; and geotechnical hazard mitigation measures. The 132094A course also focuses on interactions between the geotechnical specialist and the bridge design engineer in the seismic design process.

OUTCOMES
Upon completion of the course, participants will be able to:

- Describe the AASHTO seismic design performance criteria and develop an AASHTO acceleration response spectra for reference site (weak rock) conditions.
- Calculate fundamental period of the site and peak ground velocity from a spectral acceleration.
- Identify key soil properties necessary for seismic analysis and methods for evaluating them.
- Identify conditions warranting, establish input parameters, and conduct a one-dimensional equivalent linear site response analysis.
- Assess seismic slope stability and deformation potential in accordance with the AASHTO specifications and national state of art analysis and design guidance.
- Evaluate the potential for earthquake-induced liquefaction and its impacts on geotechnical transportation features in accordance with AASHTO specifications and national state-of-practice analysis and design guidance.
- Identify common mitigation methods for geotechnical seismic hazards.

TARGET AUDIENCE
This course is intended to engage a target audience of bridge and geotechnical engineers with zero and up to 20 years of experience, through instructor-led presentations, discussions, Q&A, group activities, walkthrough examples, and hands-on student exercises. At the end of design lessons, participants will have the opportunity to undertake a group design exercise to reinforce learning and enhance the transfer of new skills and knowledge to the workplace.

TRAINING LEVEL: Intermediate

FEE: 2022: $800 Per Person; 2023: $800 Per Person

LENGTH: 2 DAYS (CEU: 1.4 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132094B

Course Title
LRFD Seismic Analysis and Design of Structural Foundations and Earth Retaining Structures

This 2-day NHI training course 132094B entitled “LRFD Seismic Analysis and Design of Structural Foundations and Earth Retaining Structures” is a shortened version of the NHI training course 132094 “LRFD Seismic Design of Transportation Geotechnical Features and Structural Foundations” focusing specifically on the seismic design of retaining wall and structural foundations aspects. It is a comprehensive and practical training course that addresses seismic analysis and design of transportation geotechnical features including ground motion characterization using the AASHTO acceleration response spectrum developed based upon the AASHTO or USGS hazard maps adjusted for local site conditions using AASHTO soil site factors to account for local soil conditions or upon a site specific analysis; identification and evaluation of geotechnical seismic hazards; soil-foundation-structure interaction; shallow foundation design; deep foundation design; and design or earth retaining structures, including free standing retaining walls and abutment walls. It is developed generally in consideration of the requirements and recommendations of the seismic provisions in both the AASHTO LRFD Bridge Design Specifications and the AASHTO Guide Specifications for LRFD Seismic Bridge Design, the Final Report from NCHRP Project 12-70 “Seismic Analysis and Design of Retaining Walls, Buried Structures, Slopes, and Embankments”, and 2006 FHWA Seismic Retrofitting Manual for Highway Structures. The 132094B course also focuses on interactions between the geotechnical specialist and the bridge design engineer in the seismic design process.

Outcomes
Upon completion of the course, participants will be able to:

• Describe the AASHTO seismic design performance criteria and develop an AASHTO acceleration response spectra for reference site (weak rock) conditions.
• Calculate peak ground velocity and relative displacement from spectral acceleration.
• Identify the potential impacts of geotechnical hazards on foundations and earth retaining structures.
• Describe the two types of SFSI and recognize the importance of the interaction between structural designers and geotechnical engineers in the bridge design process.
• Evaluate the seismic capacity and stiffness of a shallow foundation.
• Evaluate the seismic capacity and stiffness of a deep foundation.
• Evaluate global and internal stability of earth retaining systems.
• Calculate bi-linear force-deformation relationship for seismic design and analysis of bridge abutment-backfill interaction.

Target Audience
This course is intended to engage a target audience of bridge and geotechnical engineers with zero and up to 20 years of experience, through instructor-led presentations, discussions, Q&A, group activities, walkthrough examples, and hands-on student exercises. At the end of design lessons, participants will have the opportunity to undertake a group design exercise to reinforce learning and enhance the transfer of new skills and knowledge to the workplace.

Training Level: Intermediate

Fee: 2022: $900 Per Person; 2023: $900 Per Person

Length: 2 DAYS (CEU: 1.3 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Prior to beginning the training, it is highly recommended that you download a copy of, “Incorporation of Foundation Movements in AASHTO LRFD Bridge Design Process, Second Edition”, also referred to as the “White Paper”. This White Paper will be referenced throughout the training and can be accessed by copying and pasting the following URL into your web browser address bar: http://shrp2.transportation.org/Documents/Renewal/R19B_Incorporation%20of%20Foundation%20Movements%20in%AASHTO%20LRFD%20Bridge%20Design%20Process%20V2.pdf

Calibration at the Service Limit State, Incorporation of Foundation Movements in Structure Design is a 4-hour web-based training course offered by NHI, the authoritative source in transportation training.

Foundation movements cause many undesirable consequences, some of which include induced force effects which can lead to cracking or stress and differential movement which can lead to breaks in the grade causing rideability and/or drainage issues. These undesirable consequences often result in decreased structure life and increased maintenance costs.

Taking this course will help designers better understand calibrations for foundation movements, increasing their ability to mitigate undesirable consequences of foundation movements when designing structures. This course equips designers with the tools needed to rationally compare foundation alternatives and select the most appropriate foundation type, rather than arbitrarily using costly deep foundations.

The course consists of the following five modules covering the following topics:

1. Background and identification of key references
2. Identification of foundation movements, limit states, and terminology
3. Discussion of calibration concepts and demonstration of calibration process
4. Application of calibrated foundation movements
5. Summary and wrap-up

Note: There is no assessment for this course.

To enroll in this Web-based Training course, click “Add To Cart.”
(Launched Fall 2019)

OUTCOMES

Upon completion of the course, participants will be able to:

• Recognize the undesirable consequences due to foundation movements.
• Calibrate foundation movements using principles of limit state design.

TARGET AUDIENCE

The target audience for this web-based training is individuals responsible for, or involved with, the design and construction of bridge foundations on surface transportation projects. Typically, the individuals will include an audience that have a working knowledge of load and resistance factor design (LRFD), and a background in bridge foundation design on surface transportation facilities. This audience includes geotechnical engineers, bridge and transportation engineers, geologists, and managers. This course is intended for those with general knowledge and/or skills with the development of load and resistance factors for design of bridges and structures who desire to become familiar with calibrations for incorporation of foundation movements in structure design.
Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 4 Hours (CEU: 0 Units)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134204

Course Title
Construction of Mechanically Stabilized Earth (MSE) Walls

This training was developed by the Transportation Curriculum Coordination Council (TCCC) in partnership with AASHTO and NHI.

This training contains a collection of best practices from various agencies, including FHWA training rules, laws, policies, and procedures.

This Web-based training course begins with an overview of MSE walls: why we use them; how they work; and how they are constructed. The course emphasizes the need for inspection and explores practices to help improve inspection techniques. Participants examine the roles of the inspector, engineer, and contractor and study relevant safety procedures. The course materials present considerations for design and information contained in a geotechnical report. This course also familiarizes participants with typical project drawings and typical specifications.

The course duration is approximately 5 hours. The ten individual modules do not need to be completed at one time.

Outcomes
Upon completion of the course, participants will be able to:
- Identify the four major components of a MSE wall
- Describe the basic construction sequence for MSE
- Describe why MSE wall construction inspection is needed
- Describe the appropriate applications of MSE walls
- Describe the advantages and limitations of MSE walls
- Describe the basic design concepts used during construction
- Describe the failure modes analyzed during design
- Describe the key sections of the geotechnical report
- Describe how the geotechnical report can help familiarize the MSE wall inspector with site conditions
- Describe how reviewing the geotechnical report can help mitigate construction problems and delays
- Describe the difference between plan, elevation, and cross-section view drawings
- Describe the differences between, and the details included within, shop and contract drawings
- Identify how each type of drawing illustrates where and how MSE walls, and associated or adjacent parts, are constructed
- Describe construction inspectors’ responsibilities before and during excavation
- Describe foundation preparation techniques necessary for addressing field conditions
- Identify the components of a welded wire faced MSE wall
- Describe the construction steps for a welded wire faced MSE wall
- Describe equipment and procedures necessary to prepare concrete panels for construction of a MSE wall
- Describe the steps in constructing MSE walls with concrete panel facing
- Describe the sections within the specifications document
- Identify the relevant information contained within each specification section

Target Audience
This training is ideal for highway construction teams, specifically the highway workers and inspectors involved in the construction of MSE walls. This training is recommended for the Transportation Curriculum Coordination Council levels II, III, and IV.
**Training Level:** Basic

**Fee:** 2022: $50 Per Person; 2023: $0 Per Person

**Length:** 5 HOURS (CEU: 0 Units)

**Class Size:** Minimum: 1; Maximum: 500

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135046

COURSE TITLE
Stream Stability and Scour at Highway Bridges

Please Note: NHI offers a virtual alternative to the ILT Course 135046. To register for the virtual option, search the Course Number “135046V”.

The National Highway Institute’s (NHI) 3-day Stream Stability and Scour at Highway Bridges course provides participants with comprehensive training in the prevention of hydraulic-related bridge failures. Course participants will receive training in conducting a stream stability classification and qualitative analysis of stream response and make estimates of scour at a bridge opening.

Material for the course comes primarily from two Hydraulic Engineering Circulars (HEC), “Evaluating Scour at Bridges” (HEC-18), 5th Edition (2012), and “Stream Stability at Highway Structures” (HEC-20), 4th Edition (2012). The effects of stream instability, scour, erosion, and stream aggradation and degradation are covered. Quantitative techniques are provided for estimating long-term degradation and for calculating the magnitude of contraction scour in a bridge opening. Procedures for estimating local scour at bridge piers and abutments for simple and complex substructures are also provided. A comprehensive workshop integrates qualitative analysis and analytical techniques to determine the need for a Scour Plan of Action for correcting stream instability and scour problems. For this 3-day course, the host agency will need to select 3 optional topics (out of 8 possible topics). Course instructors will contact the host prior to the course to complete a pre-course questionnaire, determine optional topics to be taught, and discuss the course schedule.

This comprehensive training provides preventive techniques for identifying, analyzing, and calculating various hydraulic factors that impact bridge stability. Public and private sector engineers responsible for maintaining the integrity of highway bridges will find it invaluable.

Prior to the beginning of the course, participants are strongly encouraged to enroll in the following Web-based training (WBT) courses: 135091 Basic Hydraulic Principles Review, 135086 Stream Stability Factors and Concepts, and 135087 Scour at Highway Bridges: Concepts and Definitions. Mastery of the concepts covered in these WBTs will enhance participation in the Instructor-led training.

OUTCOMES
Upon completion of the course, participants will be able to:

• Identify indicators of stream instability that can threaten bridges
• Identify stream types and their potential for instability problems
• Describe open-channel hydraulics concepts in bridge scour and stream instability analyses
• Define types of scour that can occur at bridge crossings
• Describe aggradation, degradation, and contraction scour
• Calculate contraction scour for live bed and clear water conditions
• Describe factors that influence scour at piers
• Calculate pier scour for three typical case studies
• Describe the factors that influence scour at abutments
• Describe how HEC-18, HEC-20, and HEC-23 provide analysis procedures for stream instability and bridge scour
• Perform Level I and II analyses
• Classify a stream using two different classification systems
• Conduct a qualitative analysis of stream responses
• Apply the HEC-18 scour equations to determine total scour at a bridge
• Determine the need for a Scour Plan of Action at a scour-critical bridge

TARGET AUDIENCE
Federal, State, and local highway hydraulic, structural, and geotechnical engineers as well as bridge inspectors responsible for maintaining the integrity of highway bridges against possible hydraulic-related problems. Consultants
who perform bridge engineering work are encouraged to attend.

**TRAINING LEVEL:** Intermediate

**FEE:** 2022: $800 Per Person; 2023: $800 Per Person

**LENGTH:** 3 DAYS (CEU: 2 UNITS)

**CLASS SIZE:** MINIMUM: 20; maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135046V

COURSE TITLE
Stream Stability and Scour at Highway Bridges (VILT)

This comprehensive online training provides preventive techniques for identifying, analyzing, and calculating various hydraulic factors that impact bridge stability. Public and private sector engineers responsible for maintaining the integrity of highway bridges will find it invaluable.

Prior to the beginning of the online course, participants are strongly encouraged to enroll in the following Web-based training (WBT) courses: 135091 Basic Hydraulic Principles Review, 135086 Stream Stability Factors and Concepts, and 135087 Scour at Highway Bridges: Concepts and Definitions. Mastery of the concepts covered in these WBTs will enhance participation in the Virtual Instructor-led training.

OUTCOMES
Upon completion of the course, participants will be able to:
• Identify indicators of stream instability that can threaten bridges
• Identify stream types and their potential for instability problems
• Describe open-channel hydraulics concepts in bridge scour and stream instability analyses
• Define types of scour that can occur at bridge crossings
• Describe aggradation, degradation, and contraction scour
• Calculate contraction scour for live bed and clear water conditions
• Describe factors that influence scour at piers
• Calculate pier scour for three typical case studies
• Describe the factors that influence scour at abutments
• Describe how HEC-18, HEC-20, and HEC-23 provide analysis procedures for stream instability and bridge scour
• Perform Level I and II analyses
• Classify a stream using two different classification systems
• Conduct a qualitative analysis of stream responses
• Apply the HEC-18 scour equations to determine total scour at a bridge
• Determine the need for a Scour Plan of Action at a scour-critical bridge

TARGET AUDIENCE
Federal, State, and local highway hydraulic, structural, and geotechnical engineers as well as bridge inspectors responsible for maintaining the integrity of highway bridges against possible hydraulic-related problems. Consultants who perform bridge engineering work are encouraged to attend.

TRAINING LEVEL: Intermediate

FEE: 2022: $800 Per Person; 2023: $800 Per Person

LENGTH: 4 DAYS (CEU: 2 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
**COURSE NUMBER**

FHWA-NHI-135048

**COURSE TITLE**

Countermeasure Design for Bridge Scour and Stream Instability (2.5-Day)

Please Note: NHI offers a virtual alternative to the ILT Course 135048. To register for the virtual option, search the Course Number “135048V”.

This course provides an overview of countermeasures to highway related failures from the effects of stream instability, scour, erosion, and stream aggradation and degradation problems. Material for the 2.5-day course comes primarily from Hydraulic Engineering Circular (HEC) “Bridge Scour and Stream Instability Countermeasures - Experience, Selection, and Design Guidance” (HEC-23).

Given a stream instability and scour problem, participants will select appropriate countermeasures to correct the problem. The course provides training in recommended strategies for developing a plan that includes appropriate countermeasures, including alternatives to conventional riprap and filter design.

Participants will apply hydraulics analysis techniques to countermeasure design for seven design guideline workshops. The course provides an introduction to fixed and portable instrumentation for scour monitoring using slides and video demonstrations. Participants will receive training in designing a monitoring program to reduce the risk from scour.

NHI Course 135046 provides training in identifying and analyzing stream instability and scour problems at highway bridges and is recommended as a prerequisite for this course.

NHI Courses #135086 and #135087 are Web-based training module and are prerequisites for NHI Hydraulics courses 135047 and 135048.

**OUTCOMES**

Upon completion of the course, participants will be able to:

- Develop a plan of action for a scour critical bridge
- Propose countermeasures for stream instability and scour problems
- Identify countermeasures for bridge scour and stream instability using the HEC-23 countermeasures matrix
- Design selected countermeasures with HEC-23 design guidelines

**TARGET AUDIENCE**

Federal, State, and local highway hydraulic, structural, and geotechnical engineers and bridge inspectors responsible for maintaining the integrity of highway bridges against possible hydraulic-related problems. Consultants who do bridge engineering work are also encouraged to attend.

**TRAINING LEVEL:** Intermediate

**FEE:** 2022: $800 Per Person; 2023: $800 Per Person

**LENGTH:** 2.5 DAYS (CEU: 1.5 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135048V

COURSE TITLE
Countermeasure Design for Bridge Scour and Stream Instability (VILT)

This 4-day online virtual course provides an overview of countermeasures to highway related failures from the effects of stream instability, scour, erosion, and stream aggradation and degradation problems. Material for the 4-day online virtual course comes primarily from Hydraulic Engineering Circular (HEC) “Bridge Scour and Stream Instability Countermeasures - Experience, Selection, and Design Guidance” (HEC-23).

Given a stream instability and scour problem, participants will select appropriate countermeasures to correct the problem. The 4-day online virtual course provides training in recommended strategies for developing a plan that includes appropriate countermeasures, including alternatives to conventional riprap and filter design.

Participants will apply hydraulics analysis techniques to countermeasure design for seven design guideline workshops. The 4-day online virtual course provides an introduction to fixed and portable instrumentation for scour monitoring using slides and video demonstrations. Participants will receive online virtual training in designing a monitoring program to reduce the risk from scour.

NHI Course 135046 provides training in identifying and analyzing stream instability and scour problems at highway bridges and is recommended as a prerequisite for this 4-day online virtual course.

NHI Courses #135086 and #135087 are Web-based training module and are prerequisites for NHI Hydraulics courses 135047 and 135048.

OUTCOMES
Upon completion of the course, participants will be able to:
• Develop a plan of action for a scour critical bridge
• Propose countermeasures for stream instability and scour problems
• Identify countermeasures for bridge scour and stream instability using the HEC-23 countermeasures matrix
• Design selected countermeasures with HEC-23 design guidelines

TARGET AUDIENCE
Federal, State, and local highway hydraulic, structural, and geotechnical engineers and bridge inspectors responsible for maintaining the integrity of highway bridges against possible hydraulic-related problems. Consultants who do bridge engineering work are also encouraged to attend.

TRAINING LEVEL: Intermediate

FEE: 2022: $800 Per Person; 2023: $800 Per Person

LENGTH: 22 HOURS (CEU: 2.2 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
**COURSE NUMBER**

FHWA-NHI-133078

**COURSE TITLE**

Access Management: Fundamental Principles and Application

This two-day course is designed to provide those who plan, operate, design, construct, or administer surface transportation or land use systems with a basic understanding of access management concepts and tools (e.g., permits, governance, practicality) available to them, the benefits of successful access management, and the costs, consequences, and even potential liabilities of unsuccessful access management.

**OUTCOMES**

Upon completion of the course, participants will be able to:

- Define key concepts of access management and understand the symbiotic relationship of driveways, local streets, collectors, arterials and highways.
- List the benefits of good access management. Understand the consequences of poor access management.
- State the impacts of either favoring access or through traffic on the safety, operations, and sustainability of surface transportation systems for all users.
- Explain the importance of access management to complete streets and transportation (all modes) systems.
- Describe access-related challenges as they pertain to public rights-of-way and private property.
- Choose access management techniques or combinations of techniques that meet intended precepts to move traffic, or provide access, with attention to enhancing safety and operations for all users.
- Identify and address legal, political, and jurisdictional challenges to implementation of access management.

**TARGET AUDIENCE**

This course is intended for both technical and non-technical professionals working in, or having a strong interest in, transportation or land use planning, operations, design, maintenance, and development review in the public and private sectors.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $700 Per Person; 2023: $900 Per Person

**LENGTH:** 2 DAYS (CEU: 1.2 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-133078A

Course Title
Access Management: Fundamental Principles, Application and Computation

This course is designed to provide those who plan, operate, design, construct, or administer surface transportation or land use systems with a basic understanding of the concepts and tools available to them, the benefits of successful access management, and the costs of unsuccessful access management.

This three-day course provides more in-depth content targeted for technical professionals. This course is intended to attract participants beyond traditional state and local agency technical staff, including planners, engineers, permit specialists, legal counsel, and project managers associated with transportation planning, operations, design, maintenance, and development review. The third day of this three-day class is designed to provide additional and more advanced instruction to participants than the FHWA-NHI133078 (two-day) course and is for those who desire to deepen their understanding of access management through more computationally-driven applications of the course materials.

Outcomes
Upon completion of the course, participants will be able to:

- Determine the impacts of signalized and unsignalized access connections on a given corridor in terms of safety, capacity, and business market area
- Describe optimum connectivity for a given land use
- Calculate needed turn lane lengths, given a set of data
- Describe the interactions of access management treatments with both motorized and non-motorized users
- Select appropriate median access management techniques for a given application
- Select appropriate margin access management techniques for a given application

Target Audience
Technical professionals who are responsible for the engineering and planning applications necessary to support the development and administration of policies, planning, and design of transportation facilities and programs regarding access management.

Training Level: Intermediate

Fee: 2022: $800 Per Person; 2023: $1025 Per Person

Length: 3 DAYS (CEU: 1.8 UNITS)

Class Size: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-133078V

COURSE TITLE
Access Management: Fundamental Principles, Application and Computation (Virtual Delivery)

This course is designed to provide those who plan, operate, design, construct, or administer surface transportation or land use systems with a basic understanding of the concepts and tools available to them, the benefits of successful access management, and the costs of unsuccessful access management.

This four-day course provides more in-depth content targeted for technical professionals. This course is intended to attract participants beyond traditional state and local agency technical staff, including: planners, engineers, permit specialists, legal counsel, and project managers associated with transportation planning, operations, design, maintenance, and development review. The third day of this three-day class is designed to provide additional and more advanced instruction to participants than the FHWA-NHI133078 (two-day) course and is for those who desire to deepen their understanding of access management through more computationally-driven applications of the course materials.

OUTCOMES
Upon completion of the course, participants will be able to:

• Determine the impacts of signalized and unsignalized access connections on a given corridor in terms of safety, capacity, and business market area
• Describe optimum connectivity for a given land use
• Calculate needed turn lane lengths, given a set of data
• Describe the interactions of access management treatments with both motorized and non-motorized users
• Select appropriate median access management techniques for a given application
• Select appropriate margin access management techniques for a given application

TARGET AUDIENCE
Technical professionals who are responsible for the engineering and planning applications necessary to support the development and administration of policies, planning, and design of transportation facilities and programs regarding access management.

TRAINING LEVEL: Basic

FEE: 2022: $700 Per Person; 2023: $700 Per Person

LENGTH: 18 HOURS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 25

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-133107

COURSE TITLE
Principles of Evacuation Planning Tutorial (Web-Based)

Principles of Evacuation Planning Tutorial (133107) is a Web-based asynchronous/independent training that provides an introductory overview of evacuation planning topics and common considerations. It covers the roles and responsibilities of local, regional, and state agencies involved in the evacuation process, while highlighting the importance of collaboration.

This course also presents current and emerging evacuation planning tools, methodologies, and trends, and offers insight into special considerations that evacuation planning stakeholders should take into account when designing, reviewing, or contributing to evacuation planning efforts. Emphasis is placed on multi-agency/jurisdictional planning as part of identifying effective practices used in the U.S.

This training was developed at the request of the FHWA Transportation Pooled Fund Study Security and Emergency Management Update and Request. The pooled fund study states are California, Florida, Georgia, Kansas, Mississippi, Montana, New York, Texas, and Wisconsin. In addition, the TSA is a member of the pooled fund study.

OUTCOMES
Upon completion of the course, participants will be able to:

• Define evacuation planning from a transportation standpoint
• Describe how evacuation planning impacts local and state emergency management transportation operations
• Define the roles and responsibilities of local, regional, and state agencies
• List the benefits of working across agencies and localities to maximize the effectiveness of emergency planning efforts
• List evacuation planning considerations specific to Notice and No-Notice evacuations
• Describe other special considerations that evacuation planning stakeholders should take into account when executing evacuation plans
• Identify tools and methods for coordination and collaboration
• Identify current and emerging evacuation planning practices
• Describe effective emergency evacuation planning practices
• Explain the value of engaging other organizations and jurisdictions
• Identify resources available to emergency evacuation planning stakeholders and how to access them for further study

TARGET AUDIENCE
The Principles of Evacuation Planning Tutorial (133107) is designed for transportation and emergency planning stakeholders along with local leadership (e.g. local public and private emergency management stakeholders). This course also will be made available to a variety of other professionals with an interest in evacuation planning including Government jurisdictions below state level; transportation planners; metropolitan planning organizations; transportation planners (city/county); local emergency managers; transportation management center staff; state and local police planners; metro emergency planners; public works and public schools planners; and other contributing stakeholders.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 6 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-133109

COURSE TITLE
Strategies for Developing Work Zone Traffic Analysis

Strategies for Developing Work Zone Traffic Analysis is offered as a one-day instructor-led course utilizing lecture and small-group collaborative exercises to educate participants on how to develop effective transportation modeling strategies to support work zone-related decision-making. There is no hands-on computer-based modeling work conducted in this course; rather, it deals with developing analysis plans that combine people, data, and tools to address work zone issues. The course is designed to cover:

Characterizing a work zone with respect to a prospective analysis
Classes of analytical tools and their capabilities within the context of work zones
Selecting an appropriate transportation modeling approach maximizing insight into potential impacts and mitigating technical risk

The course includes lecture, full-group interaction, and small group activities. The purpose of the course is three-fold. First, it will educate the participants regarding the constraints and opportunities of work zone analysis associated with available transportation modeling tools. Second, it will build familiarity for the participants with the various work zone factors influencing the development of a transportation analysis plan. Third, it will provide the participants with practical experience in developing analysis plans in a collaborative process considering issues ranging from work zone characteristics, performance measurement, technical risk assessment and resource constraints.

OUTCOMES
Upon completion of the course, participants will be able to:
• Define the need, scope, and role of work zone modeling and analysis
• Describe the work zone analysis decision-making engine and the interactions among scheduling, application, and transportation management plan decisions
• Explain how to characterize a work zone
• Identify the transportation modeling approaches available for work zone analysis
• Discuss how a transportation modeling approach can be used given a set of work zone characteristics
• Justify the selection of transportation modeling approach

TARGET AUDIENCE
A mix of experience with traffic analysis tools and work zone planning among participants is preferred. No prior experience with traffic analysis tools is required. The course is designed to promote interactions between participants. Therefore, the group is likely to benefit from a variety of viewpoints if participants have varied levels of analytical experience and diverse agency affiliations. The group may include: State Department of Transportation Staff (District Engineers, Corridor Planners, Project Eng., Traffic Eng., Work Zone Planners) FHWA staff (Division Staff, Transportation Engineers, Traffic Staff, Planners) Metropolitan Planning Organization Staff (Planners) Consultants

TRAINING LEVEL: Basic

FEE: 2022: $400 Per Person; 2023: $500 Per Person

LENGTH: 1 DAYS (CEU: .6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-133110

Course Title
Strategies for Developing Work Zone Traffic Analyses (Web-Based)

Strategies for Developing Work Zone Traffic Analyses is an interactive Web-based training course that provides an overview of how traffic analysis tools can be applied specifically to work zone analysis problems. Traffic analysis tools represent various transportation modeling approaches such as sketch planning, travel demand modeling, and traffic simulation (microscopic, mesoscopic, and simulation approaches).

The purpose of this course is three-fold. First, it will educate the participants regarding the constraints and opportunities of work zone analysis associated with available transportation modeling approaches. Second, it will build familiarity with the various work zone factors influencing the selection of a transportation modeling approach. Third, it will provide the participants with practical experience in developing a transportation modeling approach in a collaborative process that considers issues ranging from work zone characteristics, performance measurement, technical risk assessment, and resource constraints. In conclusion, participants will be able to characterize a work zone and select and justify a transportation modeling approach based upon the work zone characterization.

Outcomes
Upon completion of the course, participants will be able to:

• Define a role for work zone modeling
• Describe the work zone analysis decision-making engine
• Explain how to characterize a work zone
• Identify transportation modeling approaches
• Describe alternative transportation modeling approaches
• Justify selection of a transportation modeling approach

Target Audience
The Strategies for Developing Work Zone Traffic Analyses (WBT) is designed for professionals employed by State DOTs (district engineers, corridor planners, project engineers, traffic engineers, and work zone planners), FHWA Division Offices Staff, transportation engineers, traffic staff, planners, MPOs, and consultants.

Training Level: Basic

Fee: 2022: $50 Per Person; 2023: $0 Per Person

Length: 4 HOURS (CEU: .4 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-133116

Course Title
Maintenance of Traffic for Technicians - WEB BASED

The Maintenance of Traffic for Technicians Web-based training presents information about the placement of, field maintenance required for, and inspection of traffic control devices. In addition, drafting work zone traffic control plans and flagging are discussed.

We've broken this training into five modules:

1. General Terms and Procedures
2. Traffic Channelizing and Control Devices
3. Traffic Control Zones
4. Flagger Operations
5. Traffic Control Zone Operations

Outcomes
Upon completion of the course, participants will be able to:
• Identify the correct placement of work zone traffic control devices
• Perform field maintenance of work zone traffic control devices
• Inspect placement or operational functions of work zone traffic control devices
• Generate work zone traffic control plans
• Explain the basics of flagging

Target Audience
This training is designed for all persons with duties that include: Direct responsibility for placement of work zone traffic control devices; Direct responsibility for field maintenance of work zone traffic control devices; Inspection of the placement or operational function of work zone traffic control devices; and Drafting or electronic generation of work zone traffic control plans. The target audience could be geographically dispersed, in need of immediate training or information, or not have access to travel funds.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 5 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-133117

COURSE TITLE
Maintenance of Traffic for Supervisors - WEB BASED

The Maintenance of Traffic for Supervisors Web-based training presents information about the placement of, field maintenance required for, and inspection of traffic control devices. In addition, drafting work zone traffic control plans and flagging are discussed. This training focuses on the design of a traffic control plan, and how and why one needs to operate and implement traffic control in the work zone.

We've broken this training into five modules:
1. Fundamental Principles of Temporary Traffic Control Zones
2. Temporary Traffic Control Devices
3. Traffic Control Zones
4. Transportation Management Plans
5. Flagger Operations

OUTCOMES
Upon completion of the course, participants will be able to:
- Describe how to create clear, organized traffic control plans
- Identify acceptable temporary traffic control devices
- Determine good and bad flagging techniques

TARGET AUDIENCE
This training is designed for personnel with responsibility or authority to decide on the specific maintenance of traffic requirements to be implemented. These positions include engineers responsible for work zone traffic control development and work site traffic supervisors. The target audience could be geographically dispersed, in need of immediate training or information, or not have access to travel funds.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 5 HOURS (CEU: .5 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-133118

COURSE TITLE
Flagger Training - WEB-BASED

Being a flagger is the most important job on the work site. Careless use of the sign or distraction from duty could cause serious injury to workers or the motoring public. Performing flagger duties diligently can prevent traffic incidents in the work area.

This is a basic training in the area of flagger training. It has been designed for someone learning the first steps in performing flagger duties. This training would be useful as a refresher course for all employees involved with work zone traffic control where flaggers are utilized.

This training does not go into individual state flagger training or certification requirements. For more information on flagger training requirements contact your State's safety office.

OUTCOMES
Upon completion of the course, participants will be able to:
• Identify the responsibilities of a flagger
• Describe the proper ways to place signs
• Describe the proper position for flagging
• Define the flagging procedures for stop, slow, and proceed
• Identify the correct procedures for various flagging situations
• Describe the proper conduct in flagging

TARGET AUDIENCE
This training is intended for individuals that will be performing or are engaging in flagger duties on construction/maintenance projects. The course will assist them in better understanding the importance and duties involved with flagging on a project. It would be beneficial to the entry level employee as well as the experienced flagger.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-133119

COURSE TITLE
Safe and Effective Use of Law Enforcement Personnel in Work Zones - WEB-BASED

NHI training 133119 Safe and Effective Use of Law Enforcement Personnel in Work Zones is an interactive Web-based training (WBT) course that provides law enforcement agencies with the practices and procedures to improve traffic safety in work zones. Work zone law enforcement is highly effective in reducing speeding, speed variability, and undesirable driving behaviors such as tailgating and unsafe lane changes, which improves both traffic and worker safety. The presence of work zone enforcement is also believed to raise driver awareness and overall alertness, further improving work zone safety.

The purpose of this course is to provide basic knowledge to help save lives, avoid work zone crashes, and improve safety when working in a work zone. This course will provide tips for safe practices for law enforcement officers (LEO’s) in work zones as well as providing for a safer work zone environment. This Web-based training will educate participants on the standards and guidelines related to temporary traffic control in work zones; the role of LEO’s in work zones; the components of a typical work zone; and the proper practices and procedures related to the use of law enforcement officers in work zones.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the role of LEO’s in work zones
• Explain proper practices and procedures related to the use of LEO’s in work zones
• Explain safe operating practices of LEO’s working in a Temporary Traffic Control (TTC) zone

TARGET AUDIENCE
133119 Safe and Effective User of Law Enforcement Personnel in Work Zones is a Web-based training course designed for LEO’s. Specifically, this course targets state troopers, state, county, municipal officers, and highway patrol officers who will participate in work zone activities.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 2 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-133121

Course Title
Traffic Signal Design and Operation
There is a need to understand that the congestion and delays that exist on our streets and roadways can be better managed with a thorough understanding of effective traffic signal timing and optimization. Well-developed, designed, implemented, maintained, and operated traffic signal control projects are essential to this process. Engineering tools are available to design, optimize, analyze, and simulate traffic flow. This course addresses the application of the “Manual of Uniform Traffic Control Devices” (MUTCD) to intersection displays, as well as signal timing, computerized traffic signal systems, control strategies, integrated systems, traffic control simulation, and optimization software. The course is divided into two primary parts: Traffic Signal Timing and Design, and Traffic Signal Systems.

Outcomes
Upon completion of the course, participants will be able to:

• List the steps required to plan, design, and implement a signalized intersection
• Devise an appropriate data collection plan for planning, designing, and operating a signalized intersection
• Perform a warrant analysis using the MUTCD warrants, including local policies
• Design basic phasing of the intersection - which movements will get a separate phase, and how they are numbered
• Calculate signal timing at the design stage for both actuated and coordinated operational strategies, including pedestrian clearance intervals
• Determine location of signal displays
• Select signal-related signs and pavement markings, including turning-movement signs and advance warning signs

Target Audience
Traffic engineering personnel from State, Federal, and local agencies involved in planning, design, operation or maintenance of traffic signals or traffic signal systems. The course will not assume any prior knowledge of computers and thus will describe the theory of operation and the manner in which it can be applied to traffic signal controls.

Training Level: Basic

Fee: 2022: $550 Per Person; 2023: $550 Per Person

Length: 2 DAYS (CEU: 1.1 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-133121V

COURSE TITLE
Traffic Signal Design and Operation (Virtual Delivery)

Traffic Signal Design and Operation is offered as an online virtual course. A virtual instructor-led training provides 100% remote learning while ensuring participants have access to expert instructors, workshop activities, and engaging peer-to-peer discussions. Register today and learn in the convenience of your home and/or office anywhere in the country, remotely. FHWA Subject Matter Experts are only available on the dates identified below during the 2022 calendar year. If these dates are not compatible with desired delivery dates, consider scheduling an in-person offering of NHI#133121. Virtual delivery on other dates will be considered on a case-by-case basis.

There is a need to understand that the congestion and delays that exist on our streets and roadways can be better managed with a thorough understanding of effective traffic signal timing and optimization. Well-developed, designed, implemented, maintained, and operated traffic signal control projects are essential to this process. Engineering tools are available to design, optimize, analyze, and simulate traffic flow. This course addresses the application of the “Manual of Uniform Traffic Control Devices” (MUTCD) to intersection displays, as well as signal timing, computerized traffic signal systems, control strategies, integrated systems, traffic control simulation, and optimization software. The course is divided into two primary parts: Traffic Signal Timing and Design, and Traffic Signal Systems.

OUTCOMES
Upon completion of the course, participants will be able to:

- List the steps required to plan, design, and implement a signalized intersection
- Devise an appropriate data collection plan for planning, designing, and operating a signalized intersection
- Perform a warrant analysis using the MUTCD warrants, including local policies
- Design basic phasing of the intersection - which movements will get a separate phase, and how they are numbered
- Calculate signal timing at the design stage for both actuated and coordinated operational strategies, including pedestrian clearance intervals
- Determine location of signal displays
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TARGET AUDIENCE
Traffic engineering personnel from State, Federal, and local agencies involved in planning, design, operation or maintenance of traffic signals or traffic signal systems. The course will not assume any prior knowledge of computers and thus will describe the theory of operation and the manner in which it can be applied to traffic signal controls.

TRAINING LEVEL: Basic

FEE: 2022: $550 Per Person; 2023: $550 Per Person

LENGTH: 17 HOURS (CEU: 1.1 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-133122

Course Title
Traffic Signal Timing Concepts

Traffic Signal Timing Concepts is a two-day course to assist in building technical expertise in signal timing by focusing on the relationship between network context and operational objectives to inform the design of signal timing parameters. The course will expand on the traditional signal timing process by incorporating an objectives and performance driven approach that leads to selection of appropriate computational methods for design and operation of traffic signal timing.

For many agencies, the design of signal timing parameters is an exercise in data collection and software driven optimization in response to citizen complaints. An ad-hoc complaint-driven processes with little documentation and infrequent attempts to quantify performance or improvements is not likely to lead to a well-managed, objective driven process for the timing and retiming of traffic signals, nor does it typically provide agencies with a good feel for the overall performance of their system. What is needed is an objective-driven, performance-oriented approach to traffic signal timing.

This course is very interactive and includes many exercises. Participants calculate various timing parameters by hand so they should bring a calculator to the course.

Completion of NHI #133121 is recommended but not required.

Outcomes
Upon completion of the course, participants will be able to:

• Discuss an objectives-based signal timing process
• Describe operations objectives in the context of network configuration and traffic conditions
• Review phasing and timing
• Design cycle lengths
• Design green time and fixed intervals
• Design phase sequence and offsets
• Develop operational mode parameters
• Evaluate signal timing outcomes

Target Audience
Traffic Signal Timing Concepts is a two-day course for practitioners involved in or responsible for design, operations, or management of traffic signals including State/MPOs/Local Government personnel and consultants and contractors.

Training Level: Intermediate

Fee: 2022: $650 Per Person; 2023: $550 Per Person

Length: 2 DAYS (CEU: 1.2 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-133122V

COURSE TITLE
Traffic Signal Timing Concepts (Virtual Delivery)

Traffic Signal Timing Concepts is now offered online as a virtual course. A virtual instructor-led training provides 100% remote learning while ensuring participants have access to expert instructors, workshop activities, and engaging peer-to-peer discussions. Register today and learn in the convenience of your home and/or office anywhere in the country, remotely. FHWA Subject Matter Experts are only available on the dates identified below during the 2022 calendar year. If these dates are not compatible with desired delivery dates, consider scheduling an in-person offering of NHI#133122. Virtual delivery on other dates will be considered on a case-by-case basis.

Traffic Signal Timing Concepts is a two-day course to assist in building technical expertise in signal timing by focusing on the relationship between network context and operational objectives to inform the design of signal timing parameters. The course will expand on the traditional signal timing process by incorporating an objectives and performance driven approach that leads to selection of appropriate computational methods for design and operation of traffic signal timing.

For many agencies, the design of signal timing parameters is an exercise in data collection and software driven optimization in response to citizen complaints. An ad-hoc complaint-driven processes with little documentation and infrequent attempts to quantify performance or improvements is not likely to lead to a well-managed, objective driven process for the timing and retiming of traffic signals, nor does it typically provide agencies with a good feel for the overall performance of their system. What is needed is an objective-driven, performance-oriented approach to traffic signal timing.

This course is very interactive and includes many exercises. Participants calculate various timing parameters by hand so they should bring a calculator to the course.

Completion of NHI #133121 is recommended but not required.

OUTCOMES
Upon completion of the course, participants will be able to:
• Discuss an objectives-based signal timing process
• Describe operations objectives in the context of network configuration and traffic conditions
• Review phasing and timing
• Design cycle lengths
• Design green time and fixed intervals
• Design phase sequence and offsets
• Develop operational mode parameters
• Evaluate signal timing outcomes

TARGET AUDIENCE
Traffic Signal Timing Concepts is a two-day course for practitioners involved in or responsible for design, operations, or management of traffic signals including State/MPOs/Local Government personnel and consultants and contractors.

TRAINING LEVEL: Intermediate

FEE: 2022: $650 Per Person; 2023: $650 Per Person

LENGTH: 17 HOURS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-133123

COURSE TITLE
Systems Engineering for Signal Systems Including Adaptive Control

Systems Engineering for Signal Systems Including Adaptive Control is a two-day course aimed to assist transportation professionals to identify the needs for improved traffic operations and utilize systems engineering principles for the implementation of traffic signal operational improvements. This course will provide traffic operations managers and personnel a comprehensive view of what is required before, during, and after the implementation of a new traffic control system. Adaptive signal control is used as the example throughout the course.

The overall goal of this course is to assist traffic operations staff in identifying traffic control system objectives and needs to facilitate planning, designing and implementing a new traffic control system. The FHWA document, Model Systems Engineering Documents for Adaptive Signal Control Technology (ASCT) Systems, (FHWA-HOP-11-027) is used for the exercises of this course.

OUTCOMES
Upon completion of the course, participants will be able to:
• Engage stakeholders
• Gather information needed for systems engineering process
• Evaluate and resolve constraints
• Assemble a concept of operations
• Extract requirements
• Document verification and validation process
• Develop a procurement strategy
• Assemble a systems engineering analysis
• Describe the systems engineering process

TARGET AUDIENCE
Professionals responsible for the planning, design, management or operation of traffic signal systems. This includes engineers, and technicians (advanced) of state/local agencies, consultants, and FHWA Operations staff.

TRAINING LEVEL: Basic

FEE: 2022: $600 Per Person; 2023: N/A

LENGTH: 2 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Successful Traffic Signal Management: The Basic Service Approach

Successful Traffic Signal Management: The Basic Service Approach is a two-day course aimed at helping agencies ensure that their limited resources are directed towards meeting the needs of the agencies most important stakeholders. A Traffic Signal Management Plan (TSMP) is a tool that documents and aligns an agency’s traffic signal design, operation and maintenance strategies to achieve basic service objectives. The application of systematic business processes is integral to maintaining the resources and workforce capability that is necessary to sustain the operation and maintenance of traffic signal systems over long periods of time. Agencies that clearly articulate their operational objectives and meaningfully measure performance tend to operate and maintain traffic signal systems more effectively than agencies that fail to document this information.

The purpose of this course will be to describe and expand on the Basic Service Concept for use in developing an agency’s Traffic Signal Management Plan. Emphasis will be placed on an agency developing a simply stated goal and then developing objectives, strategies and tactics enabling them to accomplish their stated goal. Each element of the traffic signal management plan will be thoroughly covered, resulting in a guideline that agencies can follow to develop their own TSMP.

OUTCOMES
Upon completion of the course, participants will be able to:

• Formulate clear objectives
• Select appropriate standards of performance
• Identify performance measures
• Relate organizational capabilities and resource allocation to objectives
• Assess infrastructure reliability
• Identify signal timing strategies
• Document communication policies
• Apply effective design strategies
• Develop a traffic signal management plan

TARGET AUDIENCE
Professionals involved in the design, management, operation or maintenance of traffic signal systems. This includes design engineers, operations engineers and technicians (advanced) of state/local agencies, consultants, and FHWA Operations staff.

TRAINING LEVEL: Basic

FEE: 2022: $700 Per Person; 2023: $650 Per Person

LENGTH: 2 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-133126A

Course Title
National Traffic Incident Management Responder Training - Web-Based

This training was developed under the second Strategic Highway Research Program (SHRP2), and is being provided to you by the FHWA Office of Operations.

Three injury crashes occur every minute in the United States, putting nearly 39,000 incident responders potentially in harm’s way every day. Congestion from these incidents often generates secondary crashes, further increasing traveler delay and frustration. The longer incident responders remain at the scene, the greater the risk they, and the traveling public, face. A cadre of well-trained responders helps improve traffic incident response. Better incident response improves the safety of responders and drivers, reduces crashes that occur because of incident-related congestion, decreases traffic delays caused by incidents, and can cut incident response time.

The National Traffic Incident Management Responder Training was created by responders for responders. This course provides first responders a shared understanding of the requirements for safe, quick clearance of traffic incident scenes; prompt, reliable and open communication; and motorist and responder safeguards. First responders learn how to operate more efficiently and collectively.

This training covers many TIM recommended procedures and techniques, including:
- TIM Fundamentals and Terminology
- Notification and Scene Size-Up
- Safe Vehicle Positioning
- Scene Safety
- Command Responsibilities
- Traffic Management
- Special Circumstances
- Clearance and Termination

Prerequisite Note:
It is recommended that you take the following courses offered by FEMA:
IS 700 - National Management System (NIMS), An Introduction
ICS 100 - Introduction to Incident Command System (ICS)
ICS 200 - ICS for Single Resources and Initial Action Incidents

This training was developed through the second Strategic Highway Research Program (SHRP2).

Outcomes
Upon completion of the course, participants will be able to:
- Use a common set of practices and advance standards across all responder disciplines.
- The National Traffic Incident Management Training Program equips responders with a common set of core competencies and assists them in achieving the TIM National Unified Goal of strengthening TIM programs in the areas of: Responder safety; Safe, quick clearance; and Prompt, reliable, and interoperable communications.

Target Audience
The target audience for the training is individuals from all TIM responder disciplines, including: Law Enforcement, Fire/Rescue, Emergency Medical Service, Towing and Recovery, Emergency Management, Communications, Highway/Transportation and Dispatch within States, regions and localities.
**Training Level:** Basic

**Fee:** 2022: $0 Per Person; 2023: $0 Per Person

**Length:** 4.1 Hours (CEU: .4 Units)

**Class Size:** Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-133128

COURSE TITLE
Making the Business Case for Institutional, Organizational, and Procedural Changes for TSMO

This course is designed to teach state and local Transportation Systems Management and Operations (TSMO) champions how and why they need to make a business case for TSMO implementation. The course teaches the basic concepts presented in the online manual Advancing TSMO: Making the Business Case for Institutional, Organizational, and Procedural Changes.

The goal of this course is to provide an overview of the importance and benefits of making changes to agency institutional, organizational, and procedural changes to support more effective TSMO practices and equip agencies with a business case framework for successful TSMO implementation throughout their organization.

OUTCOMES
Upon completion of the course, participants will be able to:
• Identify the benefits and considerations for implementing TSMO practices
• Discover why a TSMO business case and associated business case customizations are essential to adopting and implementing TSMO practices
• Identify the recommended TSMO business case components
• Describe the role and importance of leadership in instituting TSMO practices
• List ways to customize a TSMO business case for different audiences

TARGET AUDIENCE
TSMO champions in state and local agencies seeking to make the business case to their leadership

TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: .1 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-133129

COURSE TITLE
Introduction to Automated Traffic Signal Performance Measures (ATSPM) and Application Examples

Prerequisite--NHI-133122: Traffic Signal Timing Concepts or equivalent knowledge/experience is required.

ATSPMs are defined as a suite of performance measures, data collection, and data analysis tools to support objectives and performance-based approaches to traffic signal operations, maintenance, management, and design. In this course, participants review the fundamental concepts of ATSPM including the ATSPM data application hierarchy, the transition from traditional to objectives-based signal maintenance and operations processes, how signal performance measures are generated, common performance measures and how they link to objectives, and ATSPM hardware and software configurations and how those setups impact the types of ATSPMs a system can support. Participants also explore real-world applications of ATSPM to learn about the benefits their peers have realized through the implementation and application of ATSPMs.

This course provides participants with a detailed explanation of ATSPMs and explores ways they can be integrated into agency practices to achieve an objective-driven, performance-oriented process for maintaining and operating traffic signals.

OUTCOMES
Upon completion of the course, participants will be able to:

• Discuss how ATSPMs can improve an agency’s traffic signals operations and maintenance practices for all users;
• Describe the relationship between high-resolution data, enumerations, and signal performance measures;
• Explain how key performance measures can be used for evaluating the maintenance and operations of traffic signals to meet agency objectives;
• Describe the core components of an ATSPM system; and
• Compare traditional and objectives-based signal operations and maintenance processes.

TARGET AUDIENCE
The target audience is signal engineers and operators who work with or for agencies that have implemented ATSPM technology and are working to integrate performance-based management into their day-to-day signal operations and maintenance. The secondary audience includes signal engineers, operators, and decision makers who are considering implementing ATSPM technology.

TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 2.5 HOURS (CEU: .3 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-133130

Course Title
Advanced Use of Automated Traffic Signal Performance Measures (ATSPM) and Integration into Practice

Prerequisite: NHI-133129 WBT

ATSPMs are defined as a suite of performance measures, data collection, and data analysis tools to support objectives and performance-based approaches to traffic signal operations, maintenance, management, and design. In this course, participants focus on applying what they have learned about ATSPMs in the web-based portion to different scenarios and situations.

In this course, participants will discuss how ATSPMs can be integrated into agency practices to achieve an objective-driven, performance-oriented process for maintaining and operating traffic signals. Participants will learn how to integrate ATSPM into the day-to-day management and operation of traffic signal systems, understand ATSPM charts, and validate the attainment of operational objectives.

Outcomes
Upon completion of the course, participants will be able to:

• Explain recommended signal modifications given an objective;
• Use intersection plan and signal timing sheets to diagram a detector configuration;
• Use ATSPMs to evaluate corridor performance; and
• Explain how the use of tools can help integrate ATSPM.

Target Audience
The target audience is signal engineers and operators that have implemented ATSPM technology and are working to integrate performance-based management into the day-to-day signal operations and maintenance of the host agency.

Training Level: Intermediate

Fee: 2022: $0 Per Person; 2023: N/A

Length: 11 HOURS (CEU: 1.1 UNITS)

Class Size: Minimum: 15; Maximum: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-133131

COURSE TITLE
Planning for TSMO - Introduction

This is the pilot session for web-based training course NHI-133131 Planning for TSMO - Introduction.

This introductory course focuses on planning for TSMO and ways to effectively integrate TSMO into the transportation planning process. It is a web-based self-paced training course and takes approximately 2 hours to complete. It includes an introduction to planning for TSMO, an overview of the process of planning for TSMO (an objectives-driven performance-based approach), the need and methods of collaboration, and ways to promote institutionalizing of planning for TSMO.

It includes three modules:
1. Overview and Value of Planning for TSMO
2. Incorporating Planning for TSMO into the Transportation Planning Process
3. Creating a Foundation to Plan for TSMO

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe planning for TSMO and its purpose in transportation decision making.
• Describe the features of an objectives-driven performance-based approach to planning for operations, including its relationships to other planning requirements and its applicability at various levels and contexts.
• Describe why collaboration is necessary to support planning for operations and identify the elements that create a foundation to plan for TSMO.

TARGET AUDIENCE
This course is ideal for transportation planners and operations staff who want to understand more about planning for TSMO.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: N/A

LENGTH: 2 HOURS (CEU: .2 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-133132

Course Title
Planning for TSMO - Concepts and Applications

This is the pilot session for web-based training course NHI-133132 Planning for TSMO - Concepts and Applications.

This web-based self-paced training course builds upon Course 1 (NHI-133131 Planning for TSMO - Introduction) and takes approximately 6 hours to complete and includes an examination of the steps to integrate TSMO into the transportation planning process, how TSMO strategies can enhance planning, programming, and project development outcomes, and how to implement and evaluate the effectiveness of an objectives-driven performance-based approach.

The course includes seven modules:
Course 1 Review
Goals, Objectives, and Performance Measures
Identifying, Evaluating, and Selecting TSMO Strategies
Programming
Project Development
Monitoring, Evaluating, and Reporting
Creating and Maintaining a Foundation to Plan for TSMO

Outcomes

Upon completion of the course, participants will be able to:
• Describe the importance of creating planning goals and objectives that consider reliability and performance measures to achieve desired outcomes.
• Describe the steps of the planning process for identifying and evaluating needs and selecting an appropriate TSMO strategy to solve the problem.
• Distinguish ways that TSMO strategies can be utilized in programming.
• Distinguish ways that TSMO strategies can be utilized in project development situations.
• Describe approaches to monitor and evaluate TSMO strategy effectiveness.
• Determine the partnerships and capabilities necessary to support ongoing implementation and collaboration of planning for operations in a variety of contexts.

Target Audience

This course will appeal to transportation planning and operations staff who have some experience with TSMO strategies and want to understand how to integrate TSMO into their agency processes.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: N/A

Length: 6 HOURS (CEU: .6 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-133133

COURSE TITLE
Planning for TSMO - Putting Concepts into Action

This is the pilot session for web-conference training FHWA-NHI-133133 Planning for TSMO - Putting Concepts into Action.

This web conference training session is facilitated by an instructor and can be offered as two 3-hour sessions or three 2-hour sessions. The optimal course size for this type of training is 15 people.

This interactive course will use activities that engage participants in discussion and application of knowledge to a scenario to bring the concepts of planning for TSMO to life. The course will be conducted by a “host” agency, who will provide local context and perspectives. The host agency will identify and invite participants within the State or region to participate in the course. Additionally, other individual participants may sign up for the course through NHI. Learners will be able to apply concepts to their specific interests and needs when attempting to integrate TSMO into the transportation planning, programming, and project development processes.

OUTCOMES
Upon completion of the course, participants will be able to:

• Identify the components of planning for TSMO and how planning for TSMO can support state/regional/local goals.
• Describe the paradigm shift in planning for TSMO that expands the goals and solutions that TSMO offers.
• Develop goals and performance measures as part of an effort to plan for TSMO, given a specific situation.
• Determine system performance needs and develop strategies to meet those needs for a given situation.
• Explain how TSMO solutions can be prioritized for funding and how funding can be sustained; list ways to institutionalize planning for TSMO by integrating TSMO into all planning activities.
• Assess current application of planning for operations and identify opportunities to further apply the approach in the context of the existing state/region.

TARGET AUDIENCE
This interactive course provides a venue for transportation professionals to work together to practice applying the steps (or techniques) of planning for TSMO.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: N/A
LENGTH: 6 HOURS (CEU: 0 UNITS)
CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-133134

COURSE TITLE
Introduction to Systems Engineering for Signal Systems

This is the pilot session for web-based training NHI-133134 Systems Engineering for Signal Systems

While every agency in the country that has responsibility for traffic signal systems is unique, many similarities exist as well. For many, implementing a traffic signal system can be challenging. This course helps traffic operations staff prepare to acquire a traffic signal system by understanding the purpose and basic functionality of traffic signal systems and identifying who the users of a system are. The course introduces to how to reduce risk in procuring central traffic signal systems.

This course is an intermediate level course. Participants should be familiar with traffic signal systems. The course does not teach the basics of traffic signal systems but focused on how to effectively procure them.

This course is a prerequisite for NHI-133135, which assists traffic operations staff in acquiring traffic signal systems by following a systematic process to plan, design, and implement the system as defined in the “Model Systems Engineering Documents for Central Traffic Signal Systems Model Documents”.

OUTCOMES
Upon completion of the course, participants will be able to:

• State the fundamental purpose and basic functionality of traffic signal systems
• List potential users
• Identify how to reduce risk in procuring central traffic signal systems

TARGET AUDIENCE
This course is specifically designed for engineering staff responsible for the design, management, or operation of traffic signal systems. Those who will benefit from the course include design engineers, operations engineers, and technicians (advanced) of state and local agencies, consultants, and Federal Highway Administration (FHWA) Operations staff.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: N/A

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-133135

Course Title
Practical Application of Systems Engineering for Signal Systems

11/1/22-11/2/22 session is the PILOT session of this course and participation is by invite only. We thank you for your interest in this course. If you are interested in hosting a future session, please select “host this course”.

While every agency in the country that has responsibility for traffic signal systems is unique, many similarities exist as well. For many, implementing a traffic signal system can be challenging. This course will assist traffic operations staff in acquiring new traffic signal systems by following a systematic process to plan, design, and implement the new system as defined in the Model Systems Engineering Documents for Central Traffic Signal Systems - Final Draft Model Docs. The document will be provided to participants of the course and will be used for the exercises of the course.

This course is to provide agency staff with the skills and abilities to improve central traffic signal system CTSS project outcomes. The course will empower participants to engage a needs-focused, requirements-driven CTSS procurement.

Outcomes
Upon completion of the course, participants will be able to:
• Identify project team for procuring a CTSS.
• Gather the information needed for procuring a CTSS.
• Assemble traffic signal system user needs.
• Identify requirements for a traffic signal system project.
• Document testing and acceptance processes.
• Develop a procurement strategy.

Target Audience
Anyone responsible for the design, management, or operation of traffic signal systems including design engineers, operations engineers, and technicians of state and local agencies, consultants, and Federal Highway Administration (FHWA) Operations staff.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: N/A

Length: 2 DAYS (CEU: 1.2 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Value Engineering Workshop (3-day)

Value Engineering (VE) is a systematic process of review and analysis of a project during the concept and design phases. VE is conducted by a multi-disciplined team of persons not involved in the project to provide recommendations such as: a) providing the needed functions safely, reliably, and at the lowest overall cost; b) improving the value and quality of the project; and c) reducing the time to complete the project.

This course begins with a Web-based training (WBT) component that is completed prior to the first day of the class (134005A). The 3-day workshop involves training participants to be valued contributors to the Value Engineering team, conducting a Value Engineering study in a team environment. It is preferable that the host agency provides actual project(s) to be used in this course, although The National Highway Institute (NHI) can provide projects upon request. Depending on the projects selected for use in the course, and based on the request of the host agency, the 3-day classroom session can be expanded to 4 or 5 days in length (NHI-134005B and NHI-134005C).

Upon successful course completion, participants will have acquired the training necessary to successfully participate in future Value Engineering studies for their agencies.

OUTCOMES
Upon completion of the course, participants will be able to:

- Explain how Value Engineering can improve project performance, reduce costs, and enhance value.
- Acquire the necessary behaviors and skills to be an effective Value Engineering team member with the ability to: investigate the project and analyze project functions and costs; creatively speculate on alternative ways to perform the various functions; evaluate the most effective life-cycle alternatives; develop viable alternatives into fully supported recommendations; present the recommendations to stakeholders and agency management

TARGET AUDIENCE
The target audience for this course consists of FHWA and state highway agency personnel in management, administrative, and engineering disciplines who will participate as Value Engineering team members. Consultants or agency representatives of all technical disciplines associated with project design, development, construction, and maintenance can be included in order to provide the multiple perspectives needed to maximize the effectiveness of the team.

TRAINING LEVEL: Basic

FEE: 2022: $900 Per Person; 2023: $800 Per Person

LENGTH: 3 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134005A

Course Title
Introduction to Value Engineering

This training is a prerequisite of another NHI training and is offered at no cost.

Value Engineering (VE) is a systematic process of review and analysis of a project during the concept and design phases. VE is conducted by a multi-disciplined team of persons not involved in the project to provide recommendations such as:
- a) providing the needed functions safely, reliably, and at the lowest overall cost;
- b) improving the value and quality of the project;
- c) reducing the time to complete the project.

This Web-based training is intended to provide an overview of the Value Engineering process, know as the Value Engineering study. Included in the training is a discussion of the benefits of utilizing VE, the keys to completing a successful VE study, and an overview of the objectives and tasks completed by the VE team at each phase.

Participants can complete this training independently. Those who plan on attending the 3-day Value Engineering classroom training must complete this online module prior to coming to class. Course certificates should be printed out and presented to the instructor on the first day to verify completion.

Outcomes
Upon completion of the course, participants will be able to:
- Identify the purpose of Value Engineering and its benefits to a highway transportation agency.
- Identify the critical skills required to participate successfully in the VE study.
- Describe each phase of creating a Value Engineering Job Plan in terms of the objective and tasks.

Target Audience
The target audience for this course consists of FHWA and state highway agency personnel in management, administrative, and engineering disciplines who will participate as Value Engineering team members or who are interested in learning more about the process. Consultants or agency representatives of all technical disciplines associated with project design, development, construction, and maintenance who will participate in a Value Engineering study should also attend.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: .5 Hours (CEU: 0 Units)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134005B

Course Title
Value Engineering Workshop (4-day)

Value Engineering (VE) is a systematic process of review and analysis of a project during the concept and design phases. VE is conducted by a multi-disciplined team of persons not involved in the project to provide recommendations such as:
a) providing the needed functions safely, reliably, and at the lowest overall cost; b) improving the value and quality of the project; and c) reducing the time to complete the project.

This course begins with a Web-based training (WBT) component that is completed prior to the first day of the class. The 4-day workshop involves training participants to be valued contributors to the Value Engineering team, conducting a Value Engineering study in a team environment. It is preferable that the host agency provides actual project(s) to be used in this course, although The National Highway Institute (NHI) can provide projects upon request. Depending on the projects selected for use in the course, and based on the request of the host agency, the 3-day classroom session can be expanded to 3 or 5 days in length (NHI-134005 and NHI-134005C).

Upon successful course completion, participants will have acquired the training necessary to successfully participate in future Value Engineering studies for their agencies.

Outcomes
Upon completion of the course, participants will be able to:
• Explain how value engineering can improve project performance, reduce costs, and enhance value.
• Acquire the necessary behaviors and skills to be an effective Value Engineering Team member with the ability to: Investigate the project and analyze project functions and costs; Creatively speculate on alternative ways to perform the various functions; Evaluate the most effective life-cycle alternatives; Develop viable alternatives into fully supported recommendations; Present the recommendations to stakeholders and agency management

Target Audience
The target audience for this course consists of FHWA and state highway agency personnel in management, administrative, and engineering disciplines who will participate as Value Engineering team members. Consultants or agency representatives of all technical disciplines associated with project design, development, construction, and maintenance can be included in order to provide the multiple perspectives needed to maximize the effectiveness of the team.

Training Level: Basic

Fee: 2022: $1100 Per Person; 2023: $1100 Per Person

Length: 4 DAYS (CEU: 2.4 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134005C

COURSE TITLE
Value Engineering Workshop (5-day)

Value Engineering (VE) is a systematic process of review and analysis of a project during the concept and design phases. VE is conducted by a multi-disciplined team of persons not involved in the project to provide recommendations such as: a) providing the needed functions safely, reliably, and at the lowest overall cost; b) improving the value and quality of the project; and c) reducing the time to complete the project.

This course begins with a Web-based training (WBT) component that is completed prior to the first day of the class (134005A). The 3-day workshop involves training participants to be valued contributors to the Value Engineering team, conducting a Value Engineering study in a team environment. It is preferable that the host agency provides actual project(s) to be used in this course, although The National Highway Institute (NHI) can provide projects upon request. Depending on the projects selected for use in the course, and based on the request of the host agency, the 5-day classroom session can be shortened to 3 or 4 days in length (NHI-134005 and NHI-134005B).

Upon successful course completion, participants will have acquired the training necessary to successfully participate in future Value Engineering studies for their agencies.

OUTCOMES
Upon completion of the course, participants will be able to:
• Explain how value engineering can improve project performance, reduce costs, and enhance value.
• Acquire the necessary behaviors and skills to be an effective Value Engineering Team member with the ability to: Investigate the project and analyze project functions and costs; Creatively speculate on alternative ways to perform the various functions; Evaluate the most effective life-cycle alternatives; Develop viable alternatives into fully supported recommendations; Present the recommendations to stakeholders and agency management

TARGET AUDIENCE
The target audience for this course consists of FHWA and state highway agency personnel in management, administrative, and engineering disciplines who will participate as Value Engineering team members. Consultants or agency representatives of all technical disciplines associated with project design, development, construction, and maintenance can be included in order to provide the multiple perspectives needed to maximize the effectiveness of the team.

TRAINING LEVEL: Basic

FEE: 2022: $1250 Per Person; 2023: $1250 Per Person

LENGTH: 5 DAYS (CEU: 3 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Value Engineering Workshop (3-day) VIRTUAL DELIVERY of 134005

Value Engineering (VE) is a systematic process of review and analysis of a project during the concept and design phases. VE is conducted by a multi-disciplined team of persons not involved in the project to provide recommendations such as: a) providing the needed functions safely, reliably, and at the lowest overall cost; b) improving the value and quality of the project; and c) reducing the time to complete the project.

This course begins with a Web-based training (WBT) component that is completed prior to the first day of the class (134005V). The 3-day ONLINE workshop involves training participants to be valued contributors to the Value Engineering team, conducting a Value Engineering study in a team environment. It is preferable that the host agency provides actual projects to be used in this course, although The National Highway Institute (NHI) can provide projects upon request. Depending on the projects selected for use in the course, and based on the request of the host agency, the 3-day classroom session can be expanded to 4 or 5 days in length (NHI-134005B/134005W) and NHI-134005C/134005X).

Upon successful course completion, participants will have acquired the training necessary to successfully participate in future Value Engineering studies for their agencies.

OUTCOMES

Upon completion of the course, participants will be able to:

- Explain how Value Engineering can improve project performance, reduce costs, and enhance value.
- Acquire the necessary behaviors and skills to be an effective Value Engineering team member with the ability to: Investigate the project and analyze project functions and costs; Creatively speculate on alternative ways to perform the various functions; Evaluate the most effective life-cycle alternatives; Develop viable alternatives into fully supported recommendations; Present the recommendations to stakeholders and agency management.

TARGET AUDIENCE

The target audience for this course consists of FHWA and state highway agency personnel in management, administrative, and engineering disciplines who will participate as Value Engineering team members. Consultants or agency representatives of all technical disciplines associated with project design, development, construction, and maintenance can be included in order to provide the multiple perspectives needed to maximize the effectiveness of the team.

TRAINING LEVEL: Basic

FEE: 2022: $900 Per Person; 2023: $900 Per Person

LENGTH: 24 HOURS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Value Engineering Workshop (4-day) VIRTUAL DELIVERY of 134005B

Value Engineering (VE) is a systematic process of review and analysis of a project during the concept and design phases. VE is conducted by a multi-disciplined team of persons not involved in the project to provide recommendations such as: a) providing the needed functions safely, reliably, and at the lowest overall cost; b) improving the value and quality of the project; and c) reducing the time to complete the project.

This course begins with a Web-based training (WBT) component that is completed prior to the first day of the class (134005A). The 3-day workshop involves training participants to be valued contributors to the Value Engineering team, conducting a Value Engineering study in a team environment. It is preferable that the host agency provides actual project(s) to be used in this course, although The National Highway Institute (NHI) can provide projects upon request. Depending on the projects selected for use in the course, and based on the request of the host agency, the 3-day classroom session can be expanded to 4 or 5 days in length (NHI-134005B and NHI-134005C).

Upon successful course completion, participants will have acquired the training necessary to successfully participate in future Value Engineering studies for their agencies.

OUTCOMES

Upon completion of the course, participants will be able to:

• Explain how Value Engineering can improve project performance, reduce costs, and enhance value.
• Acquire the necessary behaviors and skills to be an effective Value Engineering team member with the ability to: Investigate the project and analyze project functions and costs; Creatively speculate on alternative ways to perform the various functions; Evaluate the most effective life-cycle alternatives; Develop viable alternatives into fully supported recommendations; Present the recommendations to stakeholders and agency management

TARGET AUDIENCE

The target audience for this course consists of FHWA and state highway agency personnel in management, administrative, and engineering disciplines who will participate as Value Engineering team members. Consultants or agency representatives of all technical disciplines associated with project design, development, construction, and maintenance can be included in order to provide the multiple perspectives needed to maximize the effectiveness of the team.

TRAINING LEVEL: Basic

FEE: 2022: $900 Per Person; 2023: N/A

LENGTH: 32 HOURS (CEU: 2.4 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134005X

COURSE TITLE
Value Engineering Workshop (5-day) VIRTUAL DELIVERY of 134005C

Value Engineering (VE) is a systematic process of review and analysis of a project during the concept and design phases. VE is conducted by a multi-disciplined team of persons not involved in the project to provide recommendations such as: a) providing the needed functions safely, reliably, and at the lowest overall cost; b) improving the value and quality of the project; and c) reducing the time to complete the project.

This course begins with a Web-based training (WBT) component that is completed prior to the first day of the class (134005A). The 3-day workshop involves training participants to be valued contributors to the Value Engineering team, conducting a Value Engineering study in a team environment. It is preferable that the host agency provides actual project(s) to be used in this course, although The National Highway Institute (NHI) can provide projects upon request. Depending on the projects selected for use in the course, and based on the request of the host agency, the 3-day classroom session can be expanded to 4 or 5 days in length (NHI-134005B and NHI-134005C).

Upon successful course completion, participants will have acquired the training necessary to successfully participate in future Value Engineering studies for their agencies.

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain how Value Engineering can improve project performance, reduce costs, and enhance value.
• Acquire the necessary behaviors and skills to be an effective Value Engineering team member with the ability to: Investigate the project and analyze project functions and costs; Creatively speculate on alternative ways to perform the various functions; Evaluate the most effective life-cycle alternatives; Develop viable alternatives into fully supported recommendations; Present the recommendations to stakeholders and agency management

TARGET AUDIENCE
The target audience for this course consists of FHWA and state highway agency personnel in management, administrative, and engineering disciplines who will participate as Value Engineering team members. Consultants or agency representatives of all technical disciplines associated with project design, development, construction, and maintenance can be included in order to provide the multiple perspectives needed to maximize the effectiveness of the team.

TRAINING LEVEL: Basic

FEE: 2022: $900 Per Person; 2023: N/A

LENGTH: 40 HOURS (CEU: 3 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134109I

Course Title
Maintenance Training Series: Basics of Work Zone Traffic Control

Meeting the national requirements for work zone traffic control is a critically important responsibility of maintenance personnel. The national requirements, found in Part 6 of the Manual on Uniform Traffic Control Devices (MUTCD), promote driver and worker safety during roadway maintenance projects. This training, Basics of Work Zone Traffic Control, provides an introduction to the requirements outlined in Part 6 of the 2009 MUTCD. The course also offers an overview of the manual's structure and requirements regarding traffic control devices and their applications, flagging operations and procedures, and pedestrian and worker safety.

Through a series of work zone scenarios, this training uses the MUTCD Part 6 to review fundamental concepts of setting up work zones, including proper signage, taper lengths, and flagging procedures. Participants are encouraged to compare their State's standards, if available, to the guidance established in the MUTCD and determine what additional requirements may need to be met to establish safe, compliant work zones.

This training was developed as part of the Maintenance Training Series. To access all the courses in the series, enroll in the 134109 course.

Outcomes
Upon completion of the course, participants will be able to:

• Describe the content and use of The Manual on Uniform Traffic Control Devices (MUTCD) Part 6
• Use the MUTCD to correctly answer questions about the basics of work zone traffic control
• Differentiate among standard, guidance, and option conditions in the MUTCD
• Differentiate among standard, guidance, and option conditions in the MUTCD for work zone traffic control in rural and urban areas

Target Audience
This course is designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person
Length: 1 HOURS (CEU: 0 UNITS)
Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Web site: www.nhi.fhwa.dot.gov • E-mail: nhicustomerservice@dot.gov

**Course Number**
FHWA-NHI-137072

**Course Title**
Weather Responsive Traffic Management (WRTM)

‘Weather Responsive Traffic Management (WRTM)’ is a 6-hour long web-based training offered by NHI, the authoritative source in transportation training. This course provides information and guidance to transportation system managers and operators to help them effectively manage traffic flow and operations during adverse weather conditions. Various WRTM strategies are described and case studies are presented to illustrate existing best practices. Specific guidance is provided on how to choose, design, and implement WRTM strategies that are appropriate for different roadway, traffic, and weather conditions. Training materials include information and tools for traffic modeling and analysis, types and sources of traffic and weather data needed to support WRTM strategies, guidance on integrating weather and traffic data in daily operations, and procedures for performance measurement and evaluation of WRTM strategies. At the end of this course, participants will be able to define the WRTM concepts and frameworks and to describe different strategies and types of data and analytical tools available for the management of traffic during adverse weather events.

To enroll in this web-based training course, select ‘Add to Cart.’

**Outcomes**
Upon completion of the course, participants will be able to:
- Identify and describe the range of strategies and tools offered by WRTM for effectively managing traffic operations during weather events
- Identify the benefits associated with WRTM and the situations that warrant its application
- Identify the traffic and weather data needed to support WRTM implementation, and how to obtain and use this data
- Discuss the approaches to evaluating the performance of WRTM strategies
- Describe how agencies can more proactively implement WRTM strategies as part of transportation systems management including capacity enhancement and demand management

**Target Audience**
Transportation systems managers and operators

**Training Level:** Basic

**Fee:** 2022: $0 Per Person; 2023: $0 Per Person

**Length:** 6 HOURS (CEU: .6 UNITS)

**Class Size:** MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-137074

COURSE TITLE
Road Weather Information Systems (RWIS) Equipment and Operations

‘Road Weather Information Systems (RWIS) Equipment and Operations’ is a 4-hour long web-based training offered by NHI, the authoritative source in transportation training. Adverse weather is our common enemy in road maintenance, traffic, and emergency operations. Transportation agencies are aware of the operational and logistical challenges of such weather. Many agencies are fighting this age-old battle by implementing Road Weather Information Systems (RWIS). This requires that critical personnel be well-informed of the impacts and considerations of deploying RWIS. The goal of this course is to, not only discuss RWIS initiatives and considerations, but through workshops, exercises, and self-assessments, explore individual state and local deployment challenges which will leave participants with an action plan tailored for their specific needs.

To enroll in this web-based training course, select ‘Add to Cart.’

OUTCOMES
Upon completion of the course, participants will be able to:
• Discuss the value of regional and national RWIS Initiatives
• Explain how RWIS can benefit your region
• Identify and discuss key considerations when installing a RWIS
• Develop an action plan and identify the steps to successfully integrate a RWIS into your regional operations

TARGET AUDIENCE
Transportation professionals in highway maintenance and/or highway operations

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 4 HOURS (CEU: .4 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-380078

Course Title
Signalized Intersection Guidebook Workshop

This course provides a holistic approach to signalized intersections and considers the safety and operational implications of a particular treatment on all system users, including motorists, pedestrians, bicyclists, and transit users. Using the guide, participants learn to make insightful intersection assessments, understand the tradeoffs of potential improvement measures, and apply guidebook measures and best practices to reduce the incidence of intersection crashes.

Practitioners will find the tools and information necessary to make insightful intersection assessments and to understand the impacts of potential improvement measures. The information in this guide is based on the latest research available and includes examples of novel treatments as well as best practices in use by jurisdictions across the United States and other countries. Additional resources and references are mentioned for the practitioner who wishes to learn more about a particular subject.

This guide upon which this workshop is based is not intended to replicate or replace traditional traffic engineering documents such as the Manual on Uniform Traffic Control Devices (MUTCD), the Highway Capacity Manual (HCM) 2010 or the American Association of State Highway and Transportation Officials’ (AASHTO) A Policy on Geometric Design of Highways and Streets, nor is it intended to serve as a standard or policy document. Rather, it provides a synthesis of the best practices and treatments intended to help practitioners make informed, thoughtful decisions.

Outcomes
Upon completion of the course, participants will be able to:
- Describe the process for selecting traffic signal locations
- Explain various traffic signal parameters, left turn phasing options, and detection
- Explain the relationship between safety and operations
- Identify and describe performance and safety impacts of traffic signal treatments

Target Audience
Professionals responsible for design, management, or operation of traffic signals. This includes design engineers, operations engineers and technicians (advanced) of state/local agencies, consultants, and FHWA Operations staff.

Training Level: Intermediate

Fee: 2022: $300 Per Person; 2023: $350 Per Person

Length: 1 DAYS (CEU: .6 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-380078V

Course Title
Signalized Intersection Guidebook Workshop (VIRTUAL DELIVERY)

This course provides a holistic approach to signalized intersections and considers the safety and operational implications of a particular treatment on all system users, including motorists, pedestrians, bicyclists, and transit users. Using the guide, participants learn to make insightful intersection assessments, understand the tradeoffs of potential improvement measures, and apply guidebook measures and best practices to reduce the incidence of intersection crashes.

Practitioners will find the tools and information necessary to make insightful intersection assessments and to understand the impacts of potential improvement measures. The information in this guide is based on the latest research available and includes examples of novel treatments as well as best practices in use by jurisdictions across the United States and other countries. Additional resources and references are mentioned for the practitioner who wishes to learn more about a particular subject.

This guide upon which this workshop is based is not intended to replicate or replace traditional traffic engineering documents such as the Manual on Uniform Traffic Control Devices (MUTCD), the Highway Capacity Manual (HCM) 2010 or the American Association of State Highway and Transportation Officials’ (AASHTO) A Policy on Geometric Design of Highways and Streets, nor is it intended to serve as a standard or policy document. Rather, it provides a synthesis of the best practices and treatments intended to help practitioners make informed, thoughtful decisions.

Outcomes
Upon completion of the course, participants will be able to:

- Describe the process for selecting traffic signal locations
- Explain various traffic signal parameters, left turn phasing options, and detection
- Explain the relationship between safety and operations
- Identify and describe performance and safety impacts of traffic signal treatments

Target Audience
Professionals responsible for design, management, or operation of traffic signals. This includes design engineers, operations engineers and technicians (advanced) of state/local agencies, consultants, and FHWA Operations staff.

Training Level: Intermediate

Fee: 2022: $300 Per Person; 2023: $350 Per Person

Length: 6 HOURS (CEU: .6 UNITS)

Class Size: Minimum: 15; Maximum: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-380095

Course Title
Geometric Design: Applying Flexibility and Risk Management

Highway designers often face complex trade-offs when developing projects. A “quality” design may be thought of as satisfying the needs of a wide variety of users while balancing the often competing interests of cost, safety, mobility, social and environmental impacts. Applying flexibility and risk management in highway design requires more than simply assembling geometric elements from the available tables, charts and equations of design criteria. This transportation training provides participants with knowledge of the functional basis of critical design criteria to enable informed decisions when applying engineering judgment and flexibility. The training exercises and case studies provide practical applications of current knowledge from research and experience of safety and operational effects for various design elements.

Outcomes
Upon completion of the course, participants will be able to:

• Explain the relationships and inherent flexibility among design criteria, guidelines, standards, and policies.
• Explain key concepts and assumptions of design “rules” as a basis for judging risks and making tradeoffs.
• Apply FHWA’s Controlling Criteria and justify Design Exceptions.
• Identify available tools and techniques to quantify safety and operational effects and manage risks.
• Recognize opportunities to use performance analysis in decision-making.
• Demonstrate confidence to make design choices that are flexible, for which risks are understood, leading to better outcomes in implementing projects.

Target Audience
This training targets transportation engineers responsible for selection of roadway design criteria in the development of street and highway projects. This training will be most advantageous for practicing engineers from state highway agencies, local agencies, engineering design consultants and FHWA field offices. We encourage participation from diverse agencies in this transportation training. A mixture of professional backgrounds will facilitate conversations regarding opportunities to apply design flexibilities on actual projects involving multiple stakeholders at the state and local levels.

Training Level: Accomplished

Fee: 2022: $550 Per Person; 2023: $550 Per Person

Length: 2 DAYS (CEU: 1.2 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-380100

COURSE TITLE
Using Interactive Highway Safety Design Model (IHSDM)

How do you perform design policy checks, evaluate the safety performance, and assess the economic impacts of existing or proposed roads and design alternatives? IHSDM automates these tasks and more to help you make data-driven decisions throughout all stages of the project development process.

Learn how to use the latest IHSDM software tools to evaluate highway designs, compare alternatives, and inform investment decisions. You'll start with web-based, guided training to learn the basics of IHSDM at your own pace. Then, you'll shift to live, virtual instructor-led training to apply IHSDM modules and synthesize IHSDM output to make real-world decisions. The training will empower you to make quantitative, data-driven highway design decisions to improve safety and operations.

IHSDM is a suite of software analysis tools for evaluating the safety and operational effects of geometric design decisions. Through this blended, interactive, web-based IHSDM training course, participants will have the opportunity to use the actual IHSDM software tools to evaluate and analyze real highway designs. The new format consists of a blend of web-based (self-paced) training, virtual instructor-led training, and independent work. Upon completion of the course, participants will be able to quantify and compare the safety and operational performance of their design decisions beyond a simple check against design standards.

OUTCOMES
Upon completion of the course, participants will be able to:
• Explain the purpose of each of the IHSDM modules and related tools.
• Identify the installation process, required inputs, upload sequence, and data entry methods for the Crash Prediction Module (CPM) and Economic Analysis (EA) Tool.
• Calibrate CPM output to reflect local conditions.
• Apply the Crash Prediction Module (CPM) output to evaluate the safety of non-freeway segment, intersection, freeway, and interchange designs.
• Apply the IHSDM CPM output in the Economic Analysis (EA) Tool to perform benefit-cost analysis.
• Describe the key capabilities and appropriate uses of the other IHSDM tools.
• Use IHSDM output to make real-world decisions.

TARGET AUDIENCE
This course is designed for new and experienced personnel working on highway design projects who will be directly interacting with IHSDM software tools or applying the results. The IHSDM course benefits highway design project managers, planners, designers, safety engineers, and other personnel responsible for reviewing highway operations and safety. This course will also benefit university professors and students who use IHSDM for their courses and projects. Learners will generate quantitative information from IHSDM to help make, justify, and defend geometric design decisions throughout the highway design process.

TRAINING LEVEL: Intermediate

FEE: 2022: $75 Per Person; 2023: N/A

LENGTH: 14 HOURS (CEU: 1.4 UNITS)

CLASS SIZE: MINIMUM: 10; MAXIMUM: 40

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-380118

COURSE TITLE
Signing and Markings for Complex Freeway Interchanges

Most practitioners agree, we need a well-defined process for developing an effective guide-sign design plan. This course provides a systematic approach for developing and evaluating designs that inform highway users how to safely navigate complex freeway interchanges. This course reviews applicable standards and policies, as well as relevant principles from AASHTO--A Policy on Geometric Design (Chapter 10), NCHRP 600 Series (Human Factors), Chapters 18-21, and the MUTCD (Chapters 2D & 2E and Part 3)--to illustrate and help you identify the degree of flexibility you may have in the development and design process.

This course introduces you to the three fundamental building blocks of effective guide sign designs, Sign Design Group (SDG), Sign Type (ST) and Sign Design Layouts. You will learn how lane geometry principles such as exit lane elimination, auxiliary lanes, and lane balance can impact signing and marking layouts. You will gain a better understanding of option lane signing flexibility provided by the Manual on Uniform Traffic Control Devices (MUTCD). You will interact with various complex interchanges to identify and discuss current and potential interchange guide signing and markings with the goal of consistency, maintaining motorists’ expectations, and corridor management of guide sign designs.

Before beginning this course, participants are strongly encouraged to review four 15-minute pre-recorded PowerPoint lessons covering definitions and foundations concepts. Participants will build upon these lessons during the workshop.

OUTCOMES
Upon completion of the course, participants will be able to:

• Identify key human factors that influence the effectiveness of roadway signing and markings
• Describe key geometric concepts of interchange exit, including lane configurations and elimination methods
• Summarize the resultant effects of geometric decisions upon signing and marking
• State the relationship and factors which influence Sign Design Group, Sign Type, and Sign Design Layout
• Apply the process for designing the appropriate signing and markings layouts for optimum driver understanding and action execution

TARGET AUDIENCE
Engineers, engineering practitioners, technologists, involved in freeway and expressway design, construction, and operations. The target audience for this course should also include personnel and consultants in Roadway Design, Traffic Engineering, and other state District/Division offices or anyone who is responsible for development and planning, design and review of TCDs (signing and markings).

TRAINING LEVEL: Intermediate

FEE: 2022: $400 Per Person; 2023: $450 Per Person
LENGTH: 1 DAYS (CEU: .6 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130087

COURSE TITLE
Inspection and Maintenance of Ancillary Highway Structures

This course provides training in the inspection and maintenance of ancillary structures, such as structural supports for highway signs, luminaries, and traffic signals. Its goal is to provide agencies with information to aid in establishing and conducting an inspection program in accordance with the FHWA “Guidelines for the Installation, Inspection, Maintenance, and Repair of Structural Supports for Highway Signs, Luminaries, and Traffic Signals.”

OUTCOMES
Upon completion of the course, participants will be able to:
- List and identify common visible weld defects
- Identify appropriate nondestructive testing techniques
- Identify factors that lead to corrosion and explain mitigation methods used in ancillary structures
- Define the severity of observed defects in accordance with the FHWA guidelines
- Identify defects in base/anchor rod installations
- List key issues in construction inspection of ancillary structures
- Identify repair techniques and discuss their use

TARGET AUDIENCE
Structural engineers, material engineers, traffic engineers, field inspectors, construction supervisors, maintenance personnel, and other technical personnel involved in the installation, inspection, maintenance, and repair of ancillary highway structures. This course is not a design course; however, the information should be helpful to those working in design and specification of ancillary structures.

TRAINING LEVEL: Basic

FEE: 2022: $800 Per Person; 2023: $850 Per Person

LENGTH: 2 DAYS (CEU: 1.1 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-130091B

Course Title
Underwater Bridge Repair, Rehabilitation, and Countermeasures

Underwater Bridge Repair, Rehabilitation, and Countermeasures is a two-day course that will provide training to design engineers, construction inspectors, resident engineers and inspection divers in techniques for selecting and executing repairs to below water bridge elements. The primary goal of this course is to enable design engineers to select, design, and specify appropriate and durable repairs to below water bridge elements. A secondary goal of this course is to train staff in effective construction inspection of below water repairs. This course may be presented as a follow-up to NHI Course No. 130091A, Underwater Bridge Inspections.

Outcomes

Upon completion of the course, participants will be able to:

- Determine whether below water repairs can be completed “in the wet”, or require a cofferdam (or similar).
- Describe typical environmental constraints to performing repairs below water.
- Describe three methods of achieving a dry construction site within a body of water.
- List three attributes of good concrete repair mix designs.
- Describe the differences between flexible and rigid concrete forming systems.
- Describe underwater concrete placement techniques.
- Write installation procedures for pile jackets.
- Describe three methods for repair of pier scour.
- Describe the benefits of cathodic protection for bridge substructures.
- Describe four stages of underwater repair activities for underwater construction inspection.

Target Audience

The course is intended for design engineers, construction inspectors, resident engineers and inspection divers who may be engaged in the design, specifications or inspection of repairs to bridge elements located in and below water. The course may be of interest to contract administrators responsible for bridge repair or rehabilitation projects. It is expected that participants will have a working knowledge of bridge terminology, construction materials, and traditional repair techniques. Participants may also have backgrounds in bridge maintenance, repair, or construction. The audience will include persons with a range of education and technical backgrounds.

Training Level: Basic

Fee: 2022: $750 Per Person; 2023: $800 Per Person

Length: 2 DAYS (CEU: 1.4 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Fundamentals of Bridge Maintenance WBT

Fundamentals of Bridge Maintenance (NHI-130107A) teaches the participant the fundamental aspects of an effective bridge maintenance program. Module 1 - Introduction to Bridge Maintenance explains the importance of a balanced bridge maintenance program and the organizational structure, roles, and responsibilities of a bridge maintenance unit. Module 2 - Bridge Maintenance Management provides basic information about bridge inspections, reviews the general concept of Maintenance Management Systems (MMS) and Bridge Management Systems (BMS), reviews the various steps and activities involved in the proper planning and implementation of bridge maintenance program activities, discusses commonly used contracting bridge maintenance methods, and describes the principles of quality assurance and quality control measures used in bridge maintenance. Module 3 - Bridge Anatomy introduces bridge components, associated elements, and their intended functions, and also reviews common bridge types. Module 4 - Bridge Mechanics explains the bridge mechanics as it relates to different bridge components, introduces concepts such as redundancy and fracture critical details, and reviews basic hydraulic, scour and channel erosion concepts. Module 5 - Concrete Basics addresses the basic material properties of concrete; describes proper concrete mixing and testing processes; summarizes proper concrete placement, finishing and curing processes; and reviews proper methods for locating and removing unsound concrete. Module 6 - Maintenance of Bridge Ancillary Items examines general maintenance considerations and practices related to ancillary items often attached to bridges, such as utilities, and sign and lighting structures. This web-based training serves as a prerequisite to the 4-day instructor-led training NHI-130108 Bridge Maintenance.

OUTCOMES

Upon completion of the course, participants will be able to:

- Describe common organizational structures of transportation agencies, the role of the bridge maintenance unit and where it fits within such organizations, and the various cost-effective maintenance and preservation activities that these units perform
- Review various bridge maintenance program management activities and tools used to facilitate the accomplishment of these activities
- Classify bridge components, associated elements, and their intended function for commonly used materials
- Review the fundamentals of bridge mechanics and behaviors
- Review the fundamental steps involved in using concrete as a repair material
- Describe general maintenance practices associated with bridge mounted sign and lighting structures

TARGET AUDIENCE

The target audience for course 130107A, Fundamentals of Bridge Maintenance Web-Based Training is primarily members of Federal, State, and Local Departments of Transportation, as well as those contractors that perform work on behalf of these agencies. This training is primarily geared for individuals involved in onsite bridge maintenance activities and those that supervise the activities. This training is appropriate for those with basic knowledge of bridge maintenance and repair activities.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 7 HOURS (CEU: .7 UNITS)

CLASS SIZE: MINIMUM: 500; MAXIMUM: 500

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
**COURSE NUMBER**  
FHWA-NHI-130108

**COURSE TITLE**  
Bridge Maintenance (ILT)

Replacing the original Bridge Maintenance course (FHWA-NHI-134029), this entirely new Instructor-led Training (ILT) course will provide participants with knowledge regarding common deficiencies that occur in bridges, common defects in bridge elements, preventive maintenance techniques, and protective systems intended to prevent deterioration and deficiencies in bridges. With this knowledge, this course will enable participants to investigate proper bridge maintenance procedures using bridge maintenance resources and apply these practices on-the-job.

**WEB-BASED TRAINING (WBT) PREREQUISITE:** It is strongly recommended that participants take and complete FHWA-NHI-130107A Fundamentals of Bridge Maintenance WBT prerequisite prior to taking this 4-day ILT. This prerequisite WBT is being offered free of charge to participants.

**OUTCOMES**  
Upon completion of the course, participants will be able to:

- Identify key steps involved in the development and implementation efforts of a cost-effective preservation strategy for a group of bridges.
- Identify maintenance and/or repair needs and select the best remedial strategy.
- Discuss properties and preservation options involving common bridge materials such as concrete, steel and timber.
- Describe the step-by-step tasks required to accomplish proven preservation procedures on the various bridge elements.
- Identify critical members and avoid procedures that might result in damage such as field welding repairs on fracture critical tension members.
- Recognize problems that warrant specialized expertise, for example, soliciting the involvement of a qualified structural engineer when repairing structural damage.
- Apply effective management techniques (such as planning, scheduling, monitoring and reporting) during daily bridge maintenance operations.

**TARGET AUDIENCE**  
This course is primarily for members of State and Local Departments of Transportation, as well as those contractors that perform work on behalf of these agencies. This training is primarily geared for individuals involved in on-site bridge maintenance and preservation activities and those that supervise and manage these activities. This training is appropriate for those with intermediate to advanced experience in bridge maintenance and repair activities. This training is also suitable for those with intermediate/advanced knowledge of general maintenance and repair activities that have successfully completed the prerequisite, FHWA-NHI-130107A Fundamentals of Bridge Maintenance WBT course. Those that are not involved in on-site bridge maintenance activities, such as designers and construction personnel, may also benefit from this training.

**TRAINING LEVEL:** Intermediate

**FEE:** 2022: $1050 Per Person; 2023: $1050 Per Person

**LENGTH:** 4 DAYS (CEU: 2.3 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130109A

COURSE TITLE
Bridge Management Fundamentals

When the average citizen commutes to work or runs errands, they are relying on us, public transportation agencies, to keep their bridges safe and available for use. It is their expectation that we keep their bridges serviceable and at the lowest life-cycle cost possible. Bridge management systems will help your agency to efficiently balance the various bridge needs against available resources. The Bridge Management Fundamentals course describes a bridge management system and walks through the process of selecting and implementing the right bridge management software for your agency. Throughout the course, you will learn direct from agencies with mature and successful bridge management systems about how they get the most utility from their system.

OUTCOMES
Upon completion of the course, participants will be able to:
• Explain the need for a BMS
• Describe a typical BMS organizational structure
• Describe the seven components of a BMS
• Describe tools that are used as part of the bridge management process
• Describe an implementation plan for a comprehensive BMS
• Describe effective practices when using BMSs
• Identify successful applications of BMS components by agencies
• Describe the bridge management process as it relates to an agency business model
• Describe how to address risk

TARGET AUDIENCE
The target audience includes Federal, State, and local bridge program managers; bridge management engineers; bridge management practitioners; transportation planners; and project planning and programming personnel. Additionally, transportation performance management team members, transportation asset management team members, bridge preservation and maintenance engineers, the financial management team, bridge inspectors, and bridge designers may benefit from this training. All participants should have knowledge of basic bridge terminology.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 4 HOURS (CEU: .4 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130110

COURSE TITLE
Tunnel Safety Inspection

This 5-day, Instructor-led Training (ILT) is highly interactive and builds upon participants’ prior knowledge of tunnel and/or bridge inspection. This course covers the entire breadth of knowledge necessary to manage or execute a successful tunnel inspection based on the National Tunnel Inspection Standards (NTIS), Tunnel Operations, Maintenance, Inspection and Evaluation (TOMIE) Manual and Specifications for the National Tunnel Inventory (SNTI). However, it does not replace the need for specialized experts to assist in inspections. There are nine instructional modules. Once participants display achievement of the learning outcomes of one module, the class will progress to the next module. During the course, the instructor will lead participants through a series of case studies giving them an opportunity to practice and apply their knowledge in real-life tunnel inspection situations. The capstone case study will be a virtual tunnel inspection that takes place in a computer-simulated, 3D environment. Using this tool, participants will be able to perform a tunnel inspection and demonstrate their achievement of all learning outcomes.

*Participant Prerequisite Requirement: ALL participants should successfully complete one of the following three prerequisite requirements:

- 130054 Engineering Concepts for Bridge Inspectors; or
- 130101 Introduction to Safety Inspection of In-Service Bridges; or
- 130101A Prerequisite Assessment for Safety Inspection of In-Service Bridges.

Prior to taking this course, it is strongly recommended that participants complete 130055 Safety Inspection of In-Service Bridges, 130056 Safety Inspection of In-Service Bridges for Professional Engineers, or possess equivalent field experience.

It is not required, but strongly recommended that participants possess some design or safety inspection experience of in-service tunnels or bridges.

Host Requirements: Hosts must provide a training room large enough to accommodate at least 30 participants as well as the 15 NHI virtual tunnel laptops (provided by NHI Instructors) that will be used for the virtual tunnel exercises. Additionally, the host must ensure that ALL students have successfully met the prerequisite requirement* and have a valid course completion certificate for one of the three prerequisite options.

OUTCOMES

Upon completion of the course, participants will be able to:

• Articulate the importance and purpose of tunnel inspection
• Apply the fundamentals of tunnel inspection
• Demonstrate the inspection and evaluation of tunnel structural, civil, mechanical, electrical, signage and lighting, and fire/life safety/security elements
• Use tunnel inspection references

TARGET AUDIENCE

The target audience for the Tunnel Safety Inspection ILT course is primarily members of Federal, State, local (Authority or Commission) and Tribal highway agency employees, who are involved with tunnel design, inspection and maintenance, as well as consultants involved in inspecting tunnels or in tunnel inspection management and leadership positions.
Training Level: Basic

Fee: 2022: $1400 Per Person; 2023: $1425 Per Person

Length: 5 Days (CEU: 3.2 Units)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130122

COURSE TITLE
Design and Evaluation of Bridges for Fatigue and Fracture

This two-day training course presents relevant issues related to fatigue and fracture in steel bridges, including analysis, design, evaluation, repair, and retrofit. It is based on the AASHTO LRFD Bridge Design Specifications, Eighth Edition, as well as the AASHTO Manual for Bridge Evaluation, Second Edition, with Interim Revisions through 2016. Participant Exercises, Guided Walk Throughs, and videos are included throughout the training to aid bridge engineers with the implementation of the presented information.

This course consists of three modules. The first module serves as a general introduction to the class. The second module covers fundamentals, and it includes four lessons - Introduction to Fatigue and Fracture, Crack Growth in Steel Structures, Theory, and Characterizing Fatigue and Fracture in Bridge Members. The third module covers application, and it includes five lessons - Analysis for Fatigue, AASHTO Design Approach for Fatigue, AASHTO Design Approach for Fracture, AASHTO Evaluation Approach, and Retrofit and Repair.

The curriculum materials include a comprehensive Reference Manual in CD format (FHWA Publication No. FHWA-NHI-16-016), lecture and workshop exercises intended to promote or enhance a working knowledge of AASHTO LRFD, and a participant workbook for lecture notes and exercises.

Individuals attending this course should have a minimum BSCE degree. They should also have a working knowledge of the current AASHTO LRFD Bridge Design Specifications and should have relevant design experience using this specification on at least one steel bridge superstructure.

There are no NHI prerequisites for this course. However, select topics of this course are also addressed in NHI Courses 130078 (Fracture Critical Inspection Techniques for Steel Bridges), 130081 (LRFD for Highway Bridge Superstructures), and 130095 (LRFD and Analysis of Curved Steel Highway Bridges).

OUTCOMES
Upon completion of the course, participants will be able to:
• Explain the fundamentals of fatigue and fracture on steel highway structures
• Identify the various analysis methods for determining fatigue and fracture considerations on steel highway structures
• Explain the various AASHTO methodologies as it pertains to fatigue and fracture design
• Identify the AASHTO methodology for fatigue and fracture evaluation
• Describe the various strategies for repair and retrofit of steel highway structures

TARGET AUDIENCE
The primary audience for this course includes State DOT Bridge and Structures Engineers and Practitioners responsible for steel bridge design and evaluation. The target audience includes engineers at all levels, including designers, consultants, reviewers, maintenance and management engineers, and load raters.

TRAINING LEVEL: Intermediate

FEE: 2022: $900 Per Person; 2023: $900 Per Person

LENGTH: 2 DAYS (CEU: 1.3 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130124

COURSE TITLE
Tunnel Safety Inspection Refresher WBT Prerequisite

This web-based prerequisite training provides basic concepts with regards to tunnel inspection and safety prior to taking 130125 Tunnel Safety Inspection Refresher. This course (in addition to 130125 Tunnel Safety Inspection Refresher) comprises of a total of 18 hours, and must be completed every 5 years to satisfy regulatory requirements for tunnel inspection refresher training. With recurring refresher training, these courses help maintain the consistency of the tunnel inspection program. The course is based on the FHWA National Tunnel Inspection Standards (NTIS), the FHWA Tunnel Operations, Maintenance, Inspection and Evaluation (TOMIE) manual, and the FHWA Specifications for the National Tunnel Inventory (SNTI).

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe the current overall condition and condition trends for the nation’s tunnels
• Describe the National Tunnel Inspection Standards (NTIS)
• Describe the FHWA’s “Tunnel Operations, Maintenance, Inspection and Evaluation (TOMIE) Manual”
• Describe the FHWA’s “Specifications for the National Tunnel Inventory (SNTI)”
• Identify keys to ensuring a safe work environment
• Identify tunnel inspection documentation methods
• Define a critical finding
• Identify National Tunnel Inventory (NTI) items
• Identify tunnel structural, civil, mechanical, electrical/lighting, signage, & fire/life safety/security elements

TARGET AUDIENCE
The target audience for the Tunnel Safety Inspection Refresher WBT is primarily members of Federal, State, local and Tribal highway agency employees, specifically program managers, tunnel owners, and tunnel inspectors. A secondary target audience may include maintainers, such as operations and maintenance staff, as well as designers, load rating engineers, and asset managers.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 4 HOURS (CEU: .4 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130125

COURSE TITLE
Tunnel Safety Inspection Refresher ILT

This 2.5-day, Instructor-led Training (ILT) is highly interactive and builds upon participants’ prior knowledge of bridge and/or tunnel inspection. This course covers the entire breadth of knowledge necessary to manage or execute a successful tunnel inspection. However, it does not replace the need for specialized experts to assist in inspections. There are seven course modules. During the course, the instructor will lead participants through a series of case studies giving them an opportunity to practice and apply their knowledge in real-life tunnel inspection situations. The capstone case study comprises of a tunnel inspection exercise that takes place at the end of the course.

All participants must successfully complete the following prerequisite requirements prior to taking the FHWA-NHI-130125 course:
* 130110 Tunnel Safety Inspection Training Course
* 130124 Tunnel Safety Inspection Refresher Web-based Training

It is not required, but strongly recommended that participants possess some design or safety inspection experience of in-service bridges or tunnels.

OUTCOMES
Upon completion of the course, participants will be able to:
• Explain the importance and purpose of tunnel inspection
• Apply the fundamentals of tunnel inspection
• Demonstrate the inspection and evaluation of tunnel structural, civil, mechanical, electrical, signage, lighting, and fire/life safety/security elements
• Use tunnel inspection references

TARGET AUDIENCE
The target audience for the Tunnel Safety Inspection ILT course is primarily members of Federal, State, local (Authority or Commission) and Tribal highway agency employees, who are involved with tunnel design, inspection, and maintenance, as well as consultants involved in inspecting tunnels or in tunnel inspection management and leadership positions.

TRAINING LEVEL: Basic

FEE: 2022: $1000 Per Person; 2023: $1100 Per Person

LENGTH: 2.5 DAYS (CEU: 1.7 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-131050

COURSE TITLE
Asphalt Pavement In-Place Recycling Techniques

The use of recycled materials in asphalt pavement construction is supported by the Federal Highway Administration (FHWA) and other transportation organizations for a number of reasons. First, recycling asphalt pavements is often more cost-effective than more traditional rehabilitation and reconstruction alternatives, which is important in today's economic climate. Second, when designed and constructed effectively, these pavements perform well under a range of traffic levels and environmental conditions. Finally, recycling provides sustainable, environmental benefits, e.g., a reduced carbon footprint, the preservation of natural resources, and the reuse of high-quality aggregates contained within the existing pavement.

Transportation agencies focusing on the use of sustainable, cost-effective, and environmentally friendly construction practices must consider recycling techniques as a viable alternative to the more traditional rehabilitation techniques used on asphalt-surfaced pavements. However, increased guidance is needed on selecting the appropriate recycling technique for a given set of conditions, choosing the appropriate materials for the project, developing suitable specifications, and constructing those projects effectively. This course presents the current technology available in the asphalt pavement recycling area and provides the guidance necessary for transportation agencies to use and construct those techniques effectively.

The course is taught as a 2-day instructor-led training course focusing on project and technique selection and justification, material considerations and mix design, construction specifications, and project control considerations during construction.

There is also a web-based training (WBT) independent study that serves as a prerequisite to the instructor-led course. It takes approximately 1.5-hours to complete. The WBT introduces the pavement evaluation techniques commonly used to determine the cause and extent of pavement deterioration present in a pavement section that is a candidate for asphalt recycling. The material introduces common asphalt pavement distress types and identifies methods of assessing pavement condition, i.e., pavement condition surveys, nondestructive testing, and coring. The WBT also introduces the three recycling techniques listed below and the types of equipment commonly used for each process.

Hot in-place recycling (HIR)
Cold recycling (CR)
Full depth reclamation (FDR)

The material also discusses the use of cold milling on in-place recycling projects.

OUTCOMES
Upon completion of the course, participants will be able to:

- Describe the economic, environmental, and engineered performance benefits associated with using recycling.
- Identify the key factors that contribute to the selection of appropriate asphalt recycling techniques under different traffic levels, pavement conditions, and environments.
- Identify the key requirements in developing effective recycling construction specifications including method specification, warranty, and end result or performance specifications.
- Demonstrate the ability to select the appropriate new materials, e.g., binders and aggregates, and additives needed for each of the three asphalt recycling techniques.
- List steps that can be taken to address a variety of issues that may impact the constructability of a project.
- Each lesson has enabling learning outcomes that support each terminal learning outcome.

TARGET AUDIENCE
This course is designed for state and local transportation agency engineers, e.g., pavement managers and maintenance engineers, and other agency personnel who are responsible for selecting, designing, or constructing the agency’s asphalt pavement maintenance, resurfacing, rehabilitation, and reconstruction alternatives. The course will particularly benefit individuals responsible for selecting and designing asphalt recycling projects, for writing effective specifications, or for inspecting asphalt recycling projects during their construction. Contractors, consulting engineers, and industry representatives involved in asphalt pavement recycling will also benefit from the course.
TRAINING LEVEL: Intermediate

FEE: 2022: $200 Per Person; 2023: $230 Per Person

LENGTH: 2 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131050A

Course Title
(Introduction to) Asphalt Pavement In-Place Recycling Techniques

This training is a prerequisite of another NHI training and is offered at no cost.

Transportation agencies focusing on the use of sustainable, cost-effective, and environmentally conscious construction practices often consider in-place recycling techniques as a viable alternative to the more traditional rehabilitation techniques used on asphalt-surfaced pavements. NHI training 131050 Asphalt Pavement In-place Recycling Techniques is designed to help participants acquire necessary skills for selecting the appropriate in-place recycling technique for a given set of conditions, choosing the appropriate materials for the project, developing suitable specifications, and constructing those projects effectively.

The Asphalt Pavement In-place Recycling Techniques course includes two brief Web-based training (WBT) modules, and two days of instructor-led, classroom-based training (ILT). Through independent study, classroom interaction, and workshop activities, participants explore the current technologies available in the area of asphalt pavement in-place recycling. Two WBT lessons introduce pavement evaluation techniques and the three potential recycling techniques, along with the types of equipment commonly used for each. The classroom session focuses on project and technique selection and justification, materials considerations and mix design, construction specifications, and project control considerations during construction.

Outcomes
Upon completion of the course, participants will be able to:

• Describe the economic, environmental, and engineered performance benefits associated with using in-place asphalt recycling
• Identify the key factors that contribute to the selection of appropriate in-place asphalt recycling techniques under different traffic levels, pavement conditions, and environments
• Identify the key requirements in developing effective in-place asphalt recycling construction specifications, including method specification and end-result or performance specifications
• Demonstrate the ability to select the appropriate new materials and additives needed for each of three HMA pavement in-place recycling techniques
• List steps that can be taken to address a variety of issues that may impact the constructability of a project

Target Audience
This course is intended for State and local transportation agency engineers, such as pavement managers and maintenance engineers, and other agency personnel who are responsible for selecting, designing, or constructing the agency’s asphalt pavement maintenance, resurfacing, rehabilitation, and reconstruction alternatives. The course particularly benefits those individuals responsible for selecting and designing asphalt in-place recycling projects, for writing effective specifications, or for inspecting asphalt in-place recycling projects during their construction. Contractors, consulting engineers, and industry representatives involved in asphalt pavement in-place recycling also will benefit from this course.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 2 Hours (CEU: 0 Units)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131100

Course Title
Pavement Smoothness: Use of Inertial Profiler Measurements for Construction Quality Control

Studies have shown that roughness is one of the biggest priorities of highway users. Additional studies have shown that pavements that are built smooth stay smoother longer and provide a longer pavement life. Most State highway agencies (SHAs) have some type of smoothness specification that is used to evaluate the smoothness of newly constructed or rehabilitated pavements during acceptance testing. Many agencies also have incentives or disincentives for new construction and rehabilitation, which are based on pavement smoothness.

Increasingly these agencies are turning to inertial profilers as the most reliable instrument for construction acceptance testing and verifying pavement smoothness. The intent of this course is to train inertial profiler operators in the basics of performing construction acceptance testing and to train those reviewing the data to comprehend how those data were obtained and what they represent in order to build smoother riding roadways.

The course has been developed to be delivered in a single day of instructor-led training. In order to keep the instructor-led portion of the training to a single day, the training includes two hours of independent study that should be completed prior to attending the instructor-led session.

Outcomes
Upon completion of the course, participants will be able to:

• Perform checks of the inertial profiler components to identify that the equipment is in proper working order.
• Determine the impact of current surface and environmental conditions on data collection.
• Collect profile data using appropriate operating techniques.
• Calculate a smoothness index using appropriate data processing techniques and computational procedures for use in construction quality control and specification compliance.
• Identify what features in a collected profile are manifested in a smoothness or roughness index.

Target Audience
The course was designed for an audience directly involved in the use of inertial profilers and the application of the data obtained from inertial profilers. This includes State and contractor road profiler operators who perform data collection, initial processing, and reporting of smoothness data. Paving superintendents, project engineers, pavement engineers, and inspectors who are performing data analysis, quality control, and acceptance will also benefit from this course. Ideally, each session of the course will include a mixture of State and contractor personnel, including those who collect data, those performing data processing, and those making decisions based upon data.

Training Level: Intermediate

Fee: 2022: $150 Per Person; 2023: $150 Per Person

Length: 1 DAYS (CEU:.6 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131116

Course Title
Pavement Management Fundamentals WBT

Pavement Management Fundamentals is a self-paced training that describes the basic principles and structure of a pavement management program. Specifically, the course describes the purpose of pavement management, its core components, and the critical role pavement management plays supporting other highway transportation agency functions and programs, such as planning and programming, pavement design, and asset management.

The intent of this course is not to explain how core pavement management functions are conducted. Instead, it is to explain what the functions are, the inputs upon which they rely, and the value they provide to both pavement management and other agency business processes and programs.

Outcomes
Upon completion of the course, participants will be able to:

• Describe an effective pavement management program and the value it provides to the agency.
• Describe the critical role of data and data collection in a pavement management program.
• Explain the impact of quality and quality management in a pavement management program.
• Explain how to manage pavement data so it can be used effectively.
• Describe the activities involved in setting up PMS analyses.
• Describe how PMS products are used to support agency planning and programming decisions.
• Describe effective pavement management reporting processes.

Target Audience
The course targets practitioners who manage roadways and highways with little to no experience in pavement management or those interested in refreshing their knowledge about pavement management programs or systems. This may include people assigned pavement management duties, such as Data Collectors, Data Analysts, and Pavement Managers, and those using pavement management information to complete tasks, such as Transportation Asset Management, Maintenance, Planning, or Design personnel from federal, state, local, and tribal agencies. In addition, roadway or highway agency administrators and leaders may complete the first module, Introduction to Pavement Management Concepts, to familiarize themselves with the role pavement management fills in a transportation agency.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 3 HOURS (CEU: .3 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131117

Course Title
Basic Materials for Highway and Structure Construction and Maintenance

This training is provided by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to review basic materials for highway and structure construction and maintenance. The training was prepared by State DOT personnel for State DOT personnel. It contains good practices from various agencies. Each State agency/company has its own specifications, which the viewer needs to review and follow. This course is primarily intended for inspectors and technicians.

Although there are a number of materials used in the construction and maintenance process for both highways and structures, this course is focused on the three basic materials. They are Aggregate, Portland Cement Concrete (referred to as PCC), and Hot Mix Asphalt (referred to as HMA).

This training is directed toward entry level technicians, to give them a general view of the basic materials used in construction and maintenance. The course modules will address the procedures used in the production and sampling of aggregates.

Module 1 is called Basic Aggregates and includes quarry inspection, sand operation, stockpiling, and sampling. Module 2 covers Portland Cement, including the production of Portland Cement, the hydration process, as well as other cementing materials used in concrete such as water, admixtures, and aggregates. Module 3 reviews Hot Mix Asphalt, including the asphalt binder and aggregates used in the production.

Outcomes
Upon completion of the course, participants will be able to:

- Identify aggregate production and sampling procedures
- Recognize the ingredients of PCC and the part each plays in concrete production
- Recognize the ingredients of HMA and the part each plays in hot mix asphalt production

Target Audience
This training is designed for Level I and Level II State/local public agency personnel and their industry counterparts involved in the construction, maintenance and testing process for highways and structures. Level I or Entry refers to employees/trainees with little to no experience in the subject area and perform his/her activities under direct supervision. Level II or Intermediate refers to employees that understand and demonstrate skills in one or more areas of the entry level and perform specific tasks under general supervision.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 3 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Construction of Portland Cement Concrete Pavements

Improving and maintaining the quality of concrete is an important aspect of keeping pavements safe and long-lasting. This training provides participants with an overview of the entire Portland cement concrete (PCC) paving and restoration process: setting forms, mixing, hauling, curing and applicable repair techniques. This training is presented in several modules:

1. Construction Quality
2. PCC Production Overview
3. Slipform Paving
4. Fixed Form Paving
5. Pavement Curing, Sawing, and Joint Sealing Operations
6. Concrete Pavement Restoration

This self-paced, Web-based training is designed for participants to progress at their own pace. The training focuses on the proper methods for construction of concrete paving and pavement restoration techniques with an emphasis on cause and effect.

OUTCOMES

Upon completion of the course, participants will be able to:

• Describe the differences between truck-mixed and ready-mixed concrete
• Identify factors in production and paving operations that contribute to achieving a smooth ride
• Describe the differences between slip-form and fixed-form paving
• Identify the factors that impact saw timing and crack control
• Recognize the importance and key factors in placing joint sealant materials
• Identify the components of concrete pavement restoration application and construction techniques
• Describe the purpose and appropriate use of full depth and partial depth repairs
• Identify critical factors for curing and sawing operations that affect pavement performance
• Describe the purpose of grinding and dowel bar retrofit
• Identify applicable repair techniques for concrete pavement restoration
• Describe purpose of slab stabilization and joint and crack resealing

TARGET AUDIENCE

This training is designed for contractors, technicians, and inspectors who are involved in daily pavement operations for the placement and restoration of PCC pavements. Participants should have some working knowledge of concrete pavement construction.

TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 10 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-131122

COURSE TITLE
Portland Cement Concrete Paving Inspection

This training is provided by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to review inspection practices for Portland cement concrete paving projects. The training was originally developed by the Iowa Department of Transportation and more currently updated and reviewed by the TCCC and NHI. This course is recommended for the Transportation Curriculum Coordination Council levels I and II. This course is primarily intended for inspectors and technicians.

This training course has been prepared to provide guidance and instruction to inspectors involved in the construction of Portland cement concrete (PCC) pavements. The important tasks involved in this work are explained and proper procedures are described. The material is targeted for those who have not had experience in PCC paving construction.

OUTCOMES
Upon completion of the course, participants will be able to:

- Identify the materials in a PCC mixture and the concrete properties
- Comprehend Design Project Plans and recognize the joints types and saw cuts
- Identify the safety requirements and recognize safe Traffic Control practices
- Recognize and comprehend the use of the equipment in a PCC Paving project
- Recognize various sub grade treatments
- Inspect project tasks for compliance with pre-paving requirements, i.e., survey stakes, proof rolling, subgrade, and dowel baskets
- Inspect project tasks for compliance with PCC Paving requirements, i.e., string line, place and consolidate, finish, and texture
- Perform post-construction checks

TARGET AUDIENCE
This training is designed for FHWA, State, and local agencies and their industry counterparts involved in the process of placement and inspection of Portland cement concrete paving. It is applicable to anyone desiring a better understanding of activities and inspection procedures on Portland cement concrete paving projects.

TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 5 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131126A

Course Title
Concrete Pavement Preservation Series: Pavement Preservation Concepts

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module discusses how preventative maintenance impacts pavement preservation, good candidates for preservation, and the benefits to pavement preservation.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:

- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

Outcomes

Upon completion of the course, participants will be able to:

• Define pavement preservation and preventive maintenance
• Describe characteristics of suitable pavements for preventive maintenance
• Describe the importance of selecting and placing the “right” treatment and placing it at the “right” time
• List the benefits of pavement preservation

Target Audience

The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-131126B

COURSE TITLE
Concrete Pavement Preservation Series: Concrete Pavement Evaluation

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was sponsored by the FHWA and developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module discusses how preventative maintenance impacts pavement preservation, good candidates for preservation, and the benefits to pavement preservation. This module also describes the common procedures associated with conducting thorough pavement evaluations.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:

- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe the need for a thorough pavement evaluation
• Name the common pavement evaluation components
• Describe what information is obtained from each pavement evaluation component

TARGET AUDIENCE
The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 2 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Title
Concrete Pavement Preservation Series: Slab Stabilization

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module covers the use of slab stabilization (also known as undersealing) and slab jacking of concrete pavements. Slab stabilization restores support beneath slabs where voids have been detected, and slab jacking is used to raise depressed or settled slabs.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:
- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

Outcomes
Upon completion of the course, participants will be able to:
- List benefits of slab stabilization and slab jacking
- Describe recommended materials and mixtures
- Describe recommended construction steps for both procedures
- Identify typical construction problems and remedies for slab stabilization

Target Audience
The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
TRA aurex LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131126D

Course Title
Concrete Pavement Preservation Series: Partial-depth Repairs

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module covers the procedures for partial-depth repairs (PDR) on PCC pavements. PDR is the removal and replacement of small, shallow areas of deteriorated PCC at spalled or distressed joints.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:
- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

Outcomes
Upon completion of the course, participants will be able to:
- List benefits and appropriateness of partial-depth repairs
- List the advantages and disadvantages of different available repair materials
- Describe recommended construction procedures
- Identify typical construction problems and appropriate remedies

Target Audience
The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131126F

Course Title
Concrete Pavement Preservation Series: Retrofitted Edge Drains

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module presents design and construction information on retrofitted edge drains. This treatment is not as widely used as it once was, largely because it has limited applicability. Specifically, it must be targeted to those pavements that are 1) in good structural condition and 2) have bases with some degree of permeability that would allow water to be drained from beneath the pavement and to the edge drain.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:
- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

Outcomes
Upon completion of the course, participants will be able to:
• List benefits of drainage
• List components of edge drain systems
• Describe recommended installation procedures
• Identify typical construction problems and remedies

Target Audience
The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
Training Level: Intermediate

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 1 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131126G

Course Title
Concrete Pavement Preservation Series: Dowel Bar Retrofit

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module presents design and construction information on load transfer restoration (LTR), sometimes referred to as retrofitted load transfer. In the introduction we will describe the difference between load transfer restoration (generic term) and dowel bar retrofitting (DBR) which is a specific means of achieving LTR. There are other methods available, but DBR is the most proven.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:

- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

Outcomes
Upon completion of the course, participants will be able to:

- List benefits and applications of load transfer restoration
- Describe recommended materials and mixtures
- Describe recommended construction procedures
- Identify typical construction problems and remedies

Target Audience
The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131126H

Course Title
Concrete Pavement Preservation Series: Diamond Grinding and Grooving

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module describes recommended procedures for surface restoration of Portland cement concrete (PCC) pavements, specifically diamond grinding and diamond grooving operations.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:

- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

Outcomes
Upon completion of the course, participants will be able to:

- Differentiate between diamond grinding and diamond grooving and list the benefits of each
- Identify appropriate blade spacing dimensions for grinding and grooving
- Describe recommended construction procedures
- Identify typical construction problems and remedies

Target Audience
The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
Training Level: Intermediate

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 1 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131126I

Course Title
Concrete Pavement Preservation Series: Joint Sealing and Crack Resealing

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module covers joint resealing and crack sealing for concrete pavements. Joint resealing and crack sealing is defined as placement of an approved sealant material in an existing joint or crack to reduce moisture infiltration and prevent intrusion of incompressibles.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:
- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

Outcomes
Upon completion of the course, participants will be able to:

- List the benefits of joint resealing
- Describe desirable sealant properties and characteristics
- Describe recommended installation procedures
- Identify typical construction problems and appropriate remedies

Target Audience
The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
**TRAINING LEVEL:** Intermediate

**FEE:** 2022: $0 Per Person; 2023: $0 Per Person

**LENGTH:** 1 HOURS (CEU: 0 UNITS)

**CLASS SIZE:** MINIMUM: 1; MAXIMUM: 1

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Course Number:
FHWA-NHI-131126J

Course Title:
Concrete Pavement Preservation Series: Concrete Overlays

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module provides guidance on the selection of concrete pavement preservation strategies. Based on a collective review of a number of recent published documents, this module covers the seven step process that can be used to determine the most appropriate treatment (or combination of treatments) for a PCC pavement.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:
- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

Outcomes:
Upon completion of the course, participants will be able to:
- Describe the treatment selection process
- List the components of a life-cycle cost analysis
- List other factors that may enter the selection process

Target Audience:
The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
Training Level: Intermediate

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 1 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131126K

Course Title
Concrete Pavement Preservation Series: Strategy Selection

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance on critical concrete pavement preservation issues. The training was developed by the National Concrete Pavement Technology Center at Iowa State University in cooperation with FHWA.

This module provides guidance on the selection of concrete pavement preservation strategies. Based on a collective review of a number of recent published documents, this module covers the seven step process that can be used to determine the most appropriate treatment (or combination of treatments) for a PCC pavement.

This module is part of the curriculum from the Concrete Pavement Preservation Series (FHWA-NHI-131126) which presents current guidelines and recommendations for the design, construction, and selection of cost-effective concrete pavement preservation strategies. The other Web-based training modules are:
- NHI-131126 Concrete Pavement Preservation Series with downloadable version of the FHWA Concrete Pavement Preservation Guide
- NHI-131126A: Pavement Preservation Concepts
- NHI-131126B: Concrete Pavement Evaluation
- NHI-131126C: Slab Stabilization
- NHI-131126D: Partial-depth Repairs
- NHI-131126E: Full-depth Repairs
- NHI-131126F: Retrofitted Edge Drains
- NHI-131126G: Dowel Bar Retrofit
- NHI-131126H: Diamond Grinding and Grooving
- NHI-131126I: Joint Resealing and Crack Sealing
- NHI-131126J: Concrete Overlays
- NHI-131126K: Strategy Selection

Outcomes
Upon completion of the course, participants will be able to:
• Describe the treatment selection process
• List factors that might enter into the selection process
• Describe pavement deficiencies addressed by the different preservation treatments
• Describe how the benefits and costs of alternative treatment strategies are computed in a cost-effectiveness analysis
• Describe a process used to select the preferred treatment strategy

Target Audience
The intended audience is quite diverse, and includes design engineers, quality control personnel, contractors, suppliers, technicians, and trades people. While the course is aimed at those who have some familiarity with concrete pavements and pavement preservation, it should also be of value to those that are new to the field. This course is recommended for the Transportation Curriculum Coordination Council levels I - IV.
TRAINING LEVEL: Intermediate

FEE: 2022: $25 Per Person; 2023: $0 Per Person

LENGTH: .3 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
**Course Number**  
FHWA-NHI-131127  

**Course Title**  
Concrete Series

The Transportation Curriculum Coordination Council (TCCC) in partnership with NHI is pleased to offer this comprehensive training series (FHWA-NHI-131127) for any engineer or supervisor working with Portland cement. The series is part of a curriculum from the “Integrated Materials and Construction Practices for Concrete Pavement” manual developed through the National Concrete Pavement Technology Center at Iowa State University.

This course is recommended for the Transportation Curriculum Coordination Council levels II - IV.

To streamline registration and enable you to take some or all of these courses when it best suits your schedule, we have created this new series option which automatically registers you for all 11 modules—it’s that easy. They are as follows:

- Module 1 - TCCC Design of Pavement (FHWA-NHI-134101)
- Module 2 - TCCC Fundamentals of Materials Used for Concrete Pavements (FHWA-NHI-134084)
- Module 3 - TCCC Mix Design Principles (FHWA-NHI-134087)
- Module 4 - TCCC Fresh Concrete Properties (FHWA-NHI-134097)
- Module 5 - TCCC Basics of Cement Hydration (FHWA-NHI-134096)
- Module 6 - TCCC Incompatibility in Concrete Pavement Systems (FHWA-NHI-134085)
- Module 7 - TCCC Early Age Cracking (FHWA-NHI-134095)
- Module 8 - TCCC Hardened Concrete Properties- Durability (FHWA-NHI-134075)
- Module 9 - TCCC Construction of Concrete Pavements (FHWA-NHI-134098)
- Module 10 - TCCC QCQA for Concrete Pavements (FHWA-NHI-134100)
- Module 11 - TCCC Troubleshooting for Concrete Pavements (FHWA-NHI-134102)

**Outcomes**

Upon completion of the course, participants will be able to:

- Explain concrete pavement construction as a complex, integrated system involving several discrete practices that interrelate and affect one another in various ways
- Recognize and implement technologies, tests, and best practices to identify materials, concrete properties, and construction practices that are known to optimize concrete performance
- Identify factors that lead to premature distress in concrete, and learn how to avoid or reduce those factors
- Apply appropriate how-to and troubleshooting information

**Target Audience**

This training is intended as both a training tool and a reference to help concrete paving engineers, quality control personnel, specifiers, contractors, suppliers, technicians, and tradespeople bridge the gap between recent research and practice regarding optimizing the performance of concrete for pavements.

**Training Level:** Intermediate

**Fee:** 2022: $0 Per Person; 2023: $0 Per Person

**Length:** 12 Hours (CEU: 0 Units)

**Class Size:** Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-131129

COURSE TITLE
HMA Paving Field Inspection

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to provide guidance and instruction to inspectors involved in the construction of hot mix asphalt (HMA) pavements. The important tasks involved in this work are explained and proper procedures are described. This training is recommended for the Transportation Curriculum Coordination Council levels I, II, and III. This course is primarily intended for inspectors and technicians.

This training is arranged in a fashion to help the inspector first learn the various aspects of what is involved in a HMA paving operation and then become familiar with the duties that are a part of the HMA pavement grade inspection responsibilities. It also explains how to recognize the mix properties of a HMA mixture. The information included will assist the inspector in recognizing problems during a project and offering solutions to the problems. This training is not intended to cover every aspect of HMA paving.

OUTCOMES
Upon completion of the course, participants will be able to:
• Know various aspects of what is involved in a HMA paving operation
• Understand the duties of a HMA paving inspector
• Recognize the mix properties of a HMA mixture
• Recognize the problems that may occur on HMA paving projects
• Understand the product and project so solutions can be recommended

TARGET AUDIENCE
This training would be beneficial to anyone that is involved with an HMA paving project, but focuses on technicians/inspectors that are involved with the production, placement, and inspection of HMA paving projects.

TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 4.5 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131139

Course Title
Constructing and Inspecting Asphalt Paving Projects

The goal of this course is to prepare participants to ensure asphalt pavement construction projects conform to quality and technical specifications. The course materials introduce asphalt pavement construction best practices, from the importance of understanding project administration roles and responsibilities to the most vital elements of laydown operations and compaction.

Participants learn construction management responsibilities; recognize proper construction practices; identify construction issues and their source; determine the impact of construction issues on performance; and select communication strategies for contractors, consultants, and superiors. They can then apply the knowledge and skills to maximize quality on construction projects.

The course emphasizes the importance of a proactive approach to managing and inspecting construction projects at every stage. This includes quickly addressing problems, implementing corrective actions, and documenting communications between the agency and contractor.

Prior to attending class, participants complete a 5-minute online pre-assessment that identifies their familiarity with their agency’s asphalt pavement construction and inspection topics and issues they hope to address through training. The pre-assessment is distributed by the Local Coordinator on behalf of the instructor.

Outcomes
Upon completion of the course, participants will be able to:
• Explain the agency’s and contractor’s roles and responsibilities in supporting project quality
• Identify asphalt pavement construction best practices
• Relate common asphalt pavement construction issues to possible causes and impact on pavement performance
• Explain how to communicate construction issues to the contractor and up the project chain of command effectively
• Describe appropriate, timely inspection documentation procedures

Target Audience
This course is designed for participants who ensure a project is built to the owner’s specifications. Participants can be relatively new to asphalt or general project inspection; however, those with broader experience will learn about innovative asphalt pavement construction technologies, participate in class discussions, and share successful practices. The primary audience comprises Federal, State, consultant, and local agency inspectors and contractor personnel who are involved in the planning, construction, and review of asphalt paving projects.

Training Level: Intermediate

Fee: 2022: $500 Per Person; 2023: $500 Per Person

Length: 2 DAYS (CEU: 1.3 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131139V

Course Title
Constructing and Inspecting Asphalt Paving Projects (Virtual Delivery of NHI 131139)

Course Will No Longer Be Offered Virtually After November 3, 2022

The goal of this course is to prepare participants to ensure asphalt pavement construction projects conform to quality and technical specifications. The course materials introduce asphalt pavement construction best practices, from the importance of understanding project administration roles and responsibilities to the most vital elements of laydown operations and compaction.

Participants learn construction management responsibilities; recognize proper construction practices; identify construction issues and their source; determine the impact of construction issues on performance; and select communication strategies for contractors, consultants, and superiors. They can then apply the knowledge and skills to maximize quality on construction projects.

The course emphasizes the importance of a proactive approach to managing and inspecting construction projects at every stage. This includes quickly addressing problems, implementing corrective actions, and documenting communications between the agency and contractor.

Prior to attending class, participants complete a 5-minute online pre-assessment that identifies their familiarity with their agency’s asphalt pavement construction and inspection topics and issues they hope to address through training. The pre-assessment is distributed by the Local Coordinator on behalf of the instructor.

The 131139V - Constructing and Inspecting Asphalt Paving Projects is now offered on-line as a virtual course. A virtual instructor-led training provides 100% remote learning while ensuring participants have access to expert instructors, workshop activities, and engaging peer-to-peer discussions. Sessions are typically held as half-day events over four days.

Register today and learn the importance of a proactive approach to managing and inspecting construction projects at every stage in the convenience of your home and/or office anywhere in the country, remotely.

Outcomes
Upon completion of the course, participants will be able to:

• Explain the agency’s and contractor’s roles and responsibilities in supporting project quality
• Identify asphalt pavement construction best practices
• Relate common asphalt pavement construction issues to possible causes and impact on pavement performance
• Explain how to communicate construction issues to the contractor and up the project chain of command effectively
• Describe appropriate, timely inspection documentation procedures

Target Audience
This course is designed for participants who ensure a project is built to the owner’s specifications. Participants can be relatively new to asphalt or general project inspection; however, those with broader experience will learn about innovative asphalt pavement construction technologies, participate in class discussions, and share successful practices. The primary audience comprises Federal, State, consultant, and local agency inspectors and contractor personnel who are involved in the planning, construction, and review of asphalt paving projects.
Training Level: Intermediate

Fee: 2022: $500 Per Person; 2023: N/A

Length: 16 Hours (CEU: 1.3 Units)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131141

Course Title
Quality Assurance for Highway Construction Projects

This course replaces NHI course #134064 Transportation Construction Quality Assurance.

Construction materials account for about 50% of Federal-aid spending (FHWA internal review citation here). Therefore, it is critical for States to have a quality assurance (QA) program to ensure that projects perform as expected and are long lasting. In fact, all States are required to have a QA program for Federal-aid projects on the NHS (23 CFR 637), but risks and inconsistencies in those programs present significant challenges to maintaining levels of quality in materials and project-produced materials such as asphalt, concrete, aggregate and soil.

NHI 131141 Quality Assurance for Highway Construction Projects helps you (1) understand the impact and importance of operating a sound quality assurance program, (2) realize the associated risks to payment, and (3) recognize risks to infrastructure performance. During the course you will consistently apply quality assurance concepts and identify strengths and weaknesses in your own agency's QA program.

This new 2-day instructor-led course prepares you to identify and use the six core elements of a quality assurance program for all types of highway projects, from the simplest to most complex. All the course content, including risk-based content, is related to practical experiences and provides numerous opportunities to share and learn from other participants. Topics include:

- Basics of quality assurance
- Quality assurance program requirements including industry and agency support, the six core elements of a program, and the use of QA specifications
- Quality control and acceptance including contractor and agency roles and responsibilities; QC plans; sampling, testing, and inspection; and control charts
- Using data to measure quality including collecting data, analyzing data, interpreting data, and quantifying data variability
- Payment including percent within limits and pay factors
- Verification and materials testing dispute resolution

Outcomes
Upon completion of the course, participants will be able to:

- Consistently apply fundamental quality assurance concepts, terminology, and definitions
- Relate each of the six core elements of quality assurance to successful implementation of a quality assurance program
- Describe an organizational culture of quality
- Describe the quality assurance roles and responsibilities of agency and contractor personnel
- Apply the sampling protocols and mathematical concepts used to measure variability, review the effects of statistical distribution, and validate data to assess quality
- Describe the proper use of materials testing and inspection data for acceptance
- Relate successful quality assurance practices to alternative contracting methods
- Learn effective quality assurance practices to minimize the variability and life cycle cost associated with the construction and maintenance of a highway project

Target Audience
This is an intermediate-level course for personnel with at least one year's experience working with transportation materials and construction who apply QA specifications on transportation construction projects. Typical attendees include: Federal, state, and local agency materials and construction staff including inspectors, lab personnel, field technicians, and project managers, as well as Headquarters' engineers and Region- or District-level engineers and technicians. Secondary audiences that will benefit from the course and add value to discussions include contractor personnel, particularly their quality control managers. Additionally, consultants working for contractors or the agency as part of the quality assurance program could benefit.
TRAINING LEVEL: Intermediate

FEE: 2022: $200 Per Person; 2023: $200 Per Person

LENGTH: 2 DAYS (CEU: 1.3 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131142

Course Title
Full Depth Reclamation (FDR)

Full Depth Reclamation, or FDR, is a rehabilitation technique in which the full thickness of the asphalt pavement and a predetermined portion of the underlying materials (that is, the base, the subbase, and/or subgrade) is uniformly pulverized and blended to provide an upgraded, homogeneous material.

FDR was originally limited to low to medium traffic volume roadways; however, newer and larger equipment options mean that FDR now can be used on high traffic volume roadways. There is no upper limit to roadway traffic volumes if a pavement structural design is undertaken as part of the rehabilitation process and traffic control allows for diversion of traffic or travel on a pulverized or stabilized surface without damage.

This Web-based training contains four modules. Module 1 introduces full depth reclamation of pavements. Module 2 presents pre-production activities associated with FDR, including the pre-production meeting, roadway preparation, and FDR equipment. Module 3 covers establishing a control strip and pulverizing material, and explores various methods and agents used for stabilizing reclaimed materials. Module 4 reviews post-production actions following reclamation. It takes approximately 4.5 hours to complete the four modules.

This training was developed by the Transportation Curriculum Coordination Council (TCCC) in partnership with AASHTO and NHI.

Outcomes
Upon completion of the course, participants will be able to:
• Describe why a pre-production meeting is important
• Describe what preparation is needed for a full depth reclamation project
• List the equipment needed for a full depth reclamation project
• Identify the purposes of a control strip
• Describe the process used to pulverize existing pavement material for FDR
• List methods used to stabilize reclaimed materials
• Describe the stabilizing agents and additives used for stabilization of reclaimed materials
• Describe the finishing steps involved in full-depth reclamation
• Identify factors and actions that can affect yield and gradation result
• Describe the different methods of measuring compaction and the effect stabilizing agents may have on the results
• List factors affecting how various FDR mixtures should be cured
• Describe the steps involved in placing the final surface on a pavement
• List criteria for acceptance and payment for FDR pavements

Target Audience
This training is designed for local, county, and state owner agency technicians and inspectors. It is also useful for individuals seeking awareness or basic understanding of the topic. This training was developed by the Transportation Curriculum Coordination Council (TCCC) in partnership with AASHTO and NHI, and is recommended for TCCC levels II through IV.
Training Level: Basic

Fee: 2022: $50 Per Person; 2023: $0 Per Person

Length: 4.5 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132012

Course Title
Soils and Foundations Workshop

This course is geared toward practicing design and construction engineers who routinely deal with soil and foundation problems but have little theoretical background in soil mechanics or foundation engineering. The course takes a project-oriented approach whereby the soils input to a bridge project is followed from conception to completion. In each phase of the project, the soil concepts will be developed into specific foundation designs and recommendations. The classroom presentation includes a variety of exercises to verify achievement of learning objectives. Each participant will take away a comprehensive reference manual on soils and foundations and a participant workbook containing a copy of all slides presented and completed exercises.

NOTE TO PARTICIPANT: All participants should bring calculators that perform trigonometric calculations, a note pad, and a pencil.

NOTE TO HOST: In addition to the typical host requirements of NHI courses, for this course the host is asked to arrange for the state’s geotechnical engineering group to conduct a short presentation (usually on the second day of the course) summarizing the administrative and technical procedures followed by the host state.

Outcomes
Upon completion of the course, participants will be able to:

- Identifying the minimum level of geotechnical input in various project phases of a highway project
- Recalling the equipment and procedures used to implement a subsurface investigation of soil and rock conditions
- Demonstrating basic skills in visual description of soils native to the host state
- Recalling geotechnical facilities and personnel in the host state
- Recalling the basic soil test procedures and how the results of the various soil tests are applied results to highway projects
- Listing procedures used for both settlement and stability analysis, and recalling design solutions to stability and settlement problems for approach roadway embankments
- Listing procedures used for determining bearing capacity and settlement of shallow foundations such as spread footings
- Identifying the basic skills needed in the design and construction management of driven pile and drilled shaft foundations
- Recalling the driven pile and drilled shaft foundation construction equipment and construction inspection procedures
- Description static load testing and recalling the basic skills needed to interpret static load test results
- Recalling the basic skills needed in the design and construction of earth retaining structures
- Discussing the format and minimum content of an adequate foundation report

Target Audience
Personnel from the following units at the transportation agency could benefit from this workshop: geotechnical, bridge design, roadway design, materials, construction, and maintenance. The personnel who will benefit the most are the first-line supervisors involved in the design of highway structures and embankments. The greatest impact will be achieved by convincing structural, design, and construction engineers to use procedures from this course as a guide for routine geotechnical work. All attendees should be encouraged to attend the entire course, not just sections that are in their specialty. One of the major benefits of this course is to give engineers an appreciation of activities outside their specialties that influence, or are influenced by, the work of the geotechnical engineer.
TRAINING LEVEL: Basic

FEE: 2022: $1100 Per Person; 2023: N/A

LENGTH: 4 DAYS (CEU: 2.4 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-132043

Course Title
Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes

This course presents the concepts of mechanically stabilized earth wall (MSEW) and reinforced soil slope (RSS) systems and their application to roadways. The construction materials for both systems are described and guidance on acceptance for use is given. MSEW and RSS system construction steps are taught and typical construction practices and techniques are presented.

Outcomes
Upon completion of the course, participants will be able to:

• Recognize potential applications for MSEWs and RSS structures in transportation facilities
• Recognize differences between available systems and their components
• Understand the intent of specification/contracting method(s)
• Define and communicate major components of construction inspection of MSEWs and RSS structures to confirm compliance with design
• Understand the steps for MSEW and RSS construction and the corresponding points for inspection

Target Audience
The primary audience for this course is agency and consultant construction engineers, inspectors, and technicians. In addition, management; specification and contracting specialists; bridge/structures, geotechnical, and roadway design engineers; and engineering geologists interested in construction aspects of MSEWs and RSS structures are encouraged to attend. Attendees should have a basic knowledge of soil mechanics and structural engineering. (Note that NHI offers a 3-day course, FHWA-NHI-132042 Design of MSEWs and RSSs and a 3-day course, FHWA-NHI-132080 Inspection of MSEWs and RSSs.)

Training Level: Intermediate

Fee: 2022: $500 Per Person; 2023: $500 Per Person
Length: 1 DAYS (CEU: .6 UNITS)
Class Size: Minimum: 20; Maximum: 35

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-132081

COURSE TITLE
Highway Slope Maintenance and Slide Restoration

As focus changes toward the asset management of our existing infrastructure, the value of maintaining and managing our embankment and cut slopes becomes more apparent. This course provides the essentials to slope maintenance and slide restoration for transportation field personnel with an asset management perspective. This course is not meant to be highly technical, and explains, conceptually and in layman's terms, the conditions and factors affecting slope movement, stability and deterioration, and the cost considerations of maintenance, stabilization and of slope failures. The course also provides the fundamental aspects of slope management systems and discusses the rationale of slope management considering the legal implications of slope failures and rock fall.

OUTCOMES
Upon completion of the course, participants will be able to:
• Discuss common soil and rock slope movement and instability
• Describe common factors and conditions under which slopes deteriorate and become less stable
• Describe the affects of earth material properties on slope stability
• Discuss the influences of water on slope stability
• Identify failure-prone conditions
• Describe the importance of necessary communication and coordination with geotechnical specialists
• Discuss best maintenance practices
• Discuss methods of slope monitoring
• Describe key components of slope management systems
• Recognize common soil and rock slope stabilization techniques
• Compare cost differences between preventative measures for slope maintenance and slide restoration and costs associated with slope failures
• Discuss legal implications of slope failures, rock fall and management systems

TARGET AUDIENCE
The target audience for this course includes a wide range of transportation personnel consisting of Federal, State and local maintenance, geotechnical, operations and asset management engineers, geologists, managers, supervisors and personnel involved in assessing, maintaining, managing and repairing cut-slopes, fill-slopes and associated features. Although the potential audience of this course is wide-ranging, the course is primarily provided for the State maintenance specialists.

TRAINING LEVEL: Basic

FEE: 2022: $700 Per Person; 2023: $850 Per Person

LENGTH: 2.5 DAYS (CEU: 1.5 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 35

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-133116

COURSE TITLE
Maintenance of Traffic for Technicians - WEB BASED

The Maintenance of Traffic for Technicians Web-based training presents information about the placement of, field maintenance required for, and inspection of traffic control devices. In addition, drafting work zone traffic control plans and flagging are discussed.

We've broken this training into five modules:
1. General Terms and Procedures
2. Traffic Channelizing and Control Devices
3. Traffic Control Zones
4. Flagger Operations
5. Traffic Control Zone Operations

OUTCOMES
Upon completion of the course, participants will be able to:
• Identify the correct placement of work zone traffic control devices
• Perform field maintenance of work zone traffic control devices
• Inspect placement or operational functions of work zone traffic control devices
• Generate work zone traffic control plans
• Explain the basics of flagging

TARGET AUDIENCE
This training is designed for all persons with duties that include: Direct responsibility for placement of work zone traffic control devices; Direct responsibility for field maintenance of work zone traffic control devices; Inspection of the placement or operational function of work zone traffic control devices; and Drafting or electronic generation of work zone traffic control plans. The target audience could be geographically dispersed, in need of immediate training or information, or not have access to travel funds.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 5 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-133117

COURSE TITLE
Maintenance of Traffic for Supervisors - WEB BASED

The Maintenance of Traffic for Supervisors Web-based training presents information about the placement of, field maintenance required for, and inspection of traffic control devices. In addition, drafting work zone traffic control plans and flagging are discussed. This training focuses on the design of a traffic control plan, and how and why one needs to operate and implement traffic control in the work zone.

We've broken this training into five modules:
1. Fundamental Principles of Temporary Traffic Control Zones
2. Temporary Traffic Control Devices
3. Traffic Control Zones
4. Transportation Management Plans
5. Flagger Operations

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe how to create clear, organized traffic control plans
• Identify acceptable temporary traffic control devices
• Determine good and bad flagging techniques

TARGET AUDIENCE
This training is designed for personnel with responsibility or authority to decide on the specific maintenance of traffic requirements to be implemented. These positions include engineers responsible for work zone traffic control development and work site traffic supervisors. The target audience could be geographically dispersed, in need of immediate training or information, or not have access to travel funds.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 5 HOURS (CEU: .5 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-133118

Course Title
Flagger Training - WEB-BASED

Being a flagger is the most important job on the work site. Careless use of the sign or distraction from duty could cause serious injury to workers or the motoring public. Performing flagger duties diligently can prevent traffic incidents in the work area.

This is a basic training in the area of flagger training. It has been designed for someone learning the first steps in performing flagger duties. This training would be useful as a refresher course for all employees involved with work zone traffic control where flaggers are utilized.

This training does not go into individual state flagger training or certification requirements. For more information on flagger training requirements contact your State’s safety office.

Outcomes
Upon completion of the course, participants will be able to:
• Identify the responsibilities of a flagger
• Describe the proper ways to place signs
• Describe the proper position for flagging
• Define the flagging procedures for stop, slow, and proceed
• Identify the correct procedures for various flagging situations
• Describe the proper conduct in flagging

Target Audience
This training is intended for individuals that will be performing or are engaging in flagger duties on construction/maintenance projects. The course will assist them in better understanding the importance and duties involved with flagging on a project. It would be beneficial to the entry level employee as well as the experienced flagger.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 1 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Successful Traffic Signal Management: The Basic Service Approach

Successful Traffic Signal Management: The Basic Service Approach is a two-day course aimed at helping agencies ensure that their limited resources are directed towards meeting the needs of the agencies most important stakeholders. A Traffic Signal Management Plan (TSMP) is a tool that documents and aligns an agency’s traffic signal design, operation and maintenance strategies to achieve basic service objectives. The application of systematic business processes is integral to maintaining the resources and workforce capability that is necessary to sustain the operation and maintenance of traffic signal systems over long periods of time. Agencies that clearly articulate their operational objectives and meaningfully measure performance tend to operate and maintain traffic signal systems more effectively than agencies that fail to document this information.

The purpose of this course will be to describe and expand on the Basic Service Concept for use in developing an agency’s Traffic Signal Management Plan. Emphasis will be placed on an agency developing a simply stated goal and then developing objectives, strategies and tactics enabling them to accomplish their stated goal. Each element of the traffic signal management plan will be thoroughly covered, resulting in a guideline that agencies can follow to develop their own TSMP.

OUTCOMES

Upon completion of the course, participants will be able to:

- Formulate clear objectives
- Select appropriate standards of performance
- Identify performance measures
- Relate organizational capabilities and resource allocation to objectives
- Assess infrastructure reliability
- Identify signal timing strategies
- Document communication policies
- Apply effective design strategies
- Develop a traffic signal management plan

TARGET AUDIENCE

Professionals involved in the design, management, operation or maintenance of traffic signal systems. This includes design engineers, operations engineers and technicians (advanced) of state/local agencies, consultants, and FHWA Operations staff.

TRAINING LEVEL: Basic

FEE: 2022: $700 Per Person; 2023: $650 Per Person

LENGTH: 2 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134001

COURSE TITLE
Principles and Applications of Highway Construction Specifications

Well-written highway construction specifications are those that can be interpreted accurately to minimize confusion and reduce owner-contractor disputes. Across the country, current practices, standards, and requirements for writing specifications are changing. Agencies also are using effective specifications to manage risk and support alternative contracting methods.

NHI 134001 Principles of Writing Highway Construction Specifications is a highly engaging, two-day, instructor-led training session. It includes content that highlights the role of specifications as contract documents and tools for assigning risk. Course participants engage in lessons and practice sessions to identify types of specifications, select the most appropriate type for a given project, and generate an original, effective highway construction specification.

Course content emphasizes the use of effective grammar and writing style so that the learners can generate specifications that are correct, consistent, clear, complete, and concise.

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain the purposes of a specification.
• Explain how specifications are used to assign risk and influence the behavior of different parties, within a given a scenario.
• Compare the functions of Standard and Supplemental Specifications with the functions of Special Provisions.
• Explain how the “order of precedence” affects writing specifications and preparing plans.
• Describe the purpose of the General Provisions.
• Explain how a consistent writing style can affect the interpretation of specifications.
• Complete a checklist of the information needed before writing or revising a specification.
• Explain the potential benefits of writing in the active voice.
• Rewrite passive voice sentences into the active voice.
• Evaluate specifications to determine the need for imperative or indicative mood.
• State the five Cs used in specification writing. (Note: the five Cs include: correct; consistent; clear; complete; concise.)
• Explain each element of the AASHTO five-part format.
• Identify potential ambiguities in the wording, given a sample specification.
• Identify the potential benefits of each of the five Cs, given a sample specification.
• Apply the five Cs and the host agency’s preferred format to revise the specification, given a sample specification.
• Write a new specification to a given set of criteria using the five Cs and the host agency’s preferred format, given a sample specification.
• Compare method versus end-result specifications.
• Relate the type of specification to the allocation of risk.
• Write an end-result specification to replace a method specification, given an excerpt from a method specification.

TARGET AUDIENCE
This course is designed primarily for individuals who write, review, and implement an agency’s contract specifications. Participants might represent Federal, State, and local transportation agencies; other public agencies; contractors; and consultant firms. Individuals who do not write specifications but may contribute to their development, as well as those who use specifications, could also benefit from this course and the interaction with their classmates. Such participants might include personnel from environmental, materials, or construction sections or units; legal departments; work zone and safety professionals; contractor personnel; and any others involved with the design and construction of transportation facilities.
TRAINING LEVEL: Intermediate

FEE: 2022: $550 Per Person; 2023: $800 Per Person

LENGTH: 2 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134001T

COURSE TITLE
Principles and Applications of Highway Construction Specifications (EXAM ONLY FOR 134001V)

THIS IS THE EXAM ONLY AND CEUs WILL BE AWARDED FOR 134001V.

Well-written highway construction specifications are those that can be interpreted accurately to minimize confusion and reduce owner-contractor disputes. Across the country, current practices, standards, and requirements for writing specifications are changing. Agencies also are using effective specifications to manage risk and support alternative contracting methods.

NHI 134001 Principles of Writing Highway Construction Specifications is a highly engaging, two-day, instructor-led training session. It includes content that highlights the role of specifications as contract documents and tools for assigning risk. Course participants engage in lessons and practice sessions to identify types of specifications, select the most appropriate type for a given project, and generate an original, effective highway construction specification.

This is not a grammar course; however, adequate course content emphasizes the use of basic grammar and writing style so that the learners can generate specifications that are correct, consistent, clear, complete, and concise.

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain the purposes of a specification.
• Explain how specifications are used to assign risk and influence the behavior of different parties, within a given scenario.
• Compare the functions of Standard and Supplemental Specifications with the functions of Special Provisions.
• Explain how the “order of precedence” affects writing specifications and preparing plans.
• Describe the purpose of the General Provisions.
• Explain how a consistent writing style can affect the interpretation of specifications.
• Complete a checklist of the information needed before writing or revising a specification.
• Explain the potential benefits of writing in the active voice.
• Rewrite passive voice sentences into the active voice.
• Evaluate specifications to determine the need for imperative or indicative mood.
• State the five Cs used in specification writing. (Note: the five Cs include: correct; consistent; clear; complete; concise.)
• Explain each element of the AASHTO five-part format.
• Identify potential ambiguities in the wording, given a sample specification.
• Identify the potential benefits of each of the five Cs, given a sample specification.
• Apply the five Cs and the host agency’s preferred format to revise the specification, given a sample specification.
• Write a new specification to a given set of criteria using the five Cs and the host agency’s preferred format, given a sample specification.
• Compare method versus end-result specifications.
• Relate the type of specification to the allocation of risk.
• Write an end-result specification to replace a method specification, given an excerpt from a method specification.

TARGET AUDIENCE
This course is designed primarily for individuals who write, review, and implement an agency’s contract specifications. Participants might represent Federal, State, and local transportation agencies; other public agencies; contractors; and consultant firms. Individuals who do not write specifications but may contribute to their development, as well as those who use specifications, could also benefit from this course and the interaction with their classmates. Such participants might include personnel from environmental, materials, or construction sections or units; legal departments; work
zone and safety professionals; contractor personnel; and any others involved with the design and construction of transportation facilities.

**TRAINING LEVEL:** Intermediate

**FEE:** 2022: $0 Per Person; 2023: N/A

**LENGTH:** 1 HOURS (CEU: 0 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134001V

Course Title
Principles and Applications of Highway Construction Specifications (Virtual Delivery of 134001)

Well-written highway construction specifications are those that can be interpreted accurately to minimize confusion and reduce owner-contractor disputes. Across the country, current practices, standards, and requirements for writing specifications are changing. Agencies also are using effective specifications to manage risk and support alternative contracting methods.

NHI 134001V - Principles of Writing Highway Construction Specifications is now offered on-line as a virtual course. A virtual instructor-led training provides 100% remote learning while ensuring participants have access to expert instructors, workshop activities, and engaging peer-to-peer discussions. Sessions are typically held as half-day events over four days.

It includes content that highlights the role of specifications as contract documents and tools for assigning risk. Course participants engage in lessons and practice sessions to identify types of specifications, select the most appropriate type for a given project, and generate an original, effective highway construction specification.

Course content emphasizes the use of effective grammar and writing style so learners can generate specifications that are correct, consistent, clear, complete, and concise.

Register today to experience a highly engaging, online instructor-led training session from the convenience of your home and/or office anywhere in the country, remotely.

Outcomes
Upon completion of the course, participants will be able to:

• Explain the purposes of a specification.
• Explain how specifications are used to assign risk and influence the behavior of different parties, within a given scenario.
• Compare the functions of Standard and Supplemental Specifications with the functions of Special Provisions.
• Explain how the “order of precedence” affects writing specifications and preparing plans.
• Describe the purpose of the General Provisions.
• Explain how a consistent writing style can affect the interpretation of specifications.
• Complete a checklist of the information needed before writing or revising a specification.
• Explain the potential benefits of writing in the active voice.
• Rewrite passive voice sentences into the active voice.
• Evaluate specifications to determine the need for imperative or indicative mood.
• State the five Cs used in specification writing. (Note: the five Cs include: correct; consistent; clear; complete; concise.)
• Explain each element of the AASHTO five-part format.
• Identify potential ambiguities in the wording, given a sample specification.
• Identify the potential benefits of each of the five Cs, given a sample specification.
• Apply the five Cs and the host agency’s preferred format to revise the specification, given a sample specification.
• Write a new specification to a given set of criteria using the five Cs and the host agency’s preferred format, given a sample specification.
• Compare method versus end-result specifications.
• Relate the type of specification to the allocation of risk.
• Write an end-result specification to replace a method specification, given an excerpt from a method specification.

Target Audience
This course is designed primarily for individuals who write, review, and implement an agency’s contract specifications.
Participants might represent Federal, State, and local transportation agencies; other public agencies; contractors; and consultant firms. Individuals who do not write specifications but may contribute to their development, as well as those who use specifications, could also benefit from this course and the interaction with their classmates. Such participants might include personnel from environmental, materials, or construction sections or units; legal departments; work zone and safety professionals; contractor personnel; and any others involved with the design and construction of transportation facilities.

**TRAINING LEVEL:** Intermediate

**FEE:** 2022: $550 Per Person; 2023: $650 Per Person

**LENGTH:** 12 HOURS (CEU: 1.2 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134005

Course Title
Value Engineering Workshop (3-day)

Value Engineering (VE) is a systematic process of review and analysis of a project during the concept and design phases. VE is conducted by a multi-disciplined team of persons not involved in the project to provide recommendations such as: a) providing the needed functions safely, reliably, and at the lowest overall cost; b) improving the value and quality of the project; and c) reducing the time to complete the project.

This course begins with a Web-based training (WBT) component that is completed prior to the first day of the class (134005A). The 3-day workshop involves training participants to be valued contributors to the Value Engineering team, conducting a Value Engineering study in a team environment. It is preferable that the host agency provides actual project(s) to be used in this course, although The National Highway Institute (NHI) can provide projects upon request. Depending on the projects selected for use in the course, and based on the request of the host agency, the 3-day classroom session can be expanded to 4 or 5 days in length (NHI-134005B and NHI-134005C).

Upon successful course completion, participants will have acquired the training necessary to successfully participate in future Value Engineering studies for their agencies.

Outcomes

Upon completion of the course, participants will be able to:

• Explain how Value Engineering can improve project performance, reduce costs, and enhance value.
• Acquire the necessary behaviors and skills to be an effective Value Engineering team member with the ability to: Investigate the project and analyze project functions and costs; Creatively speculate on alternative ways to perform the various functions; Evaluate the most effective life-cycle alternatives; Develop viable alternatives into fully supported recommendations; Present the recommendations to stakeholders and agency management

Target Audience

The target audience for this course consists of FHWA and state highway agency personnel in management, administrative, and engineering disciplines who will participate as Value Engineering team members. Consultants or agency representatives of all technical disciplines associated with project design, development, construction, and maintenance can be included in order to provide the multiple perspectives needed to maximize the effectiveness of the team.

Training Level: Basic

Fee: 2022: $900 Per Person; 2023: $800 Per Person

Length: 3 DAYS (CEU: 1.8 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134005A

Course Title
Introduction to Value Engineering

This training is a prerequisite of another NHI training and is offered at no cost.

Value Engineering (VE) is a systematic process of review and analysis of a project during the concept and design phases. VE is conducted by a multi-disciplined team of persons not involved in the project to provide recommendations such as: a) providing the needed functions safely, reliably, and at the lowest overall cost; b) improving the value and quality of the project; and c) reducing the time to complete the project.

This Web-based training is intended to provide an overview of the Value Engineering process, known as the Value Engineering study. Included in the training is a discussion of the benefits of utilizing VE, the keys to completing a successful VE study, and an overview of the objectives and tasks completed by the VE team at each phase.

Participants can complete this training independently. Those who plan on attending the 3-day Value Engineering classroom training must complete this online module prior to coming to class. Course certificates should be printed out and presented to the instructor on the first day to verify completion.

Outcomes
Upon completion of the course, participants will be able to:

- Identify the purpose of Value Engineering and its benefits to a highway transportation agency.
- Identify the critical skills required to participate successfully in the VE study.
- Describe each phase of creating a Value Engineering Job Plan in terms of the objective and tasks.

Target Audience
The target audience for this course consists of FHWA and state highway agency personnel in management, administrative, and engineering disciplines who will participate as Value Engineering team members or who are interested in learning more about the process. Consultants or agency representatives of all technical disciplines associated with project design, development, construction, and maintenance who will participate in a Value Engineering study should also attend.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: .5 Hours (CEU: 0 Units)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134005B

COURSE TITLE
Value Engineering Workshop (4-day)

Value Engineering (VE) is a systematic process of review and analysis of a project during the concept and design phases. VE is conducted by a multi-disciplined team of persons not involved in the project to provide recommendations such as: a) providing the needed functions safely, reliably, and at the lowest overall cost; b) improving the value and quality of the project; and c) reducing the time to complete the project.

This course begins with a Web-based training (WBT) component that is completed prior to the first day of the class. The 4-day workshop involves training participants to be valued contributors to the Value Engineering team, conducting a Value Engineering study in a team environment. It is preferable that the host agency provides actual project(s) to be used in this course, although The National Highway Institute (NHI) can provide projects upon request. Depending on the projects selected for use in the course, and based on the request of the host agency, the 3-day classroom session can be expanded to 3 or 5 days in length (NHI-134005 and NHI-134005C).

Upon successful course completion, participants will have acquired the training necessary to successfully participate in future Value Engineering studies for their agencies.

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain how value engineering can improve project performance, reduce costs, and enhance value.
• Acquire the necessary behaviors and skills to be an effective Value Engineering Team member with the ability to: Investigate the project and analyze project functions and costs; Creatively speculate on alternative ways to perform the various functions; Evaluate the most effective life-cycle alternatives; Develop viable alternatives into fully supported recommendations; Present the recommendations to stakeholders and agency management

TARGET AUDIENCE
The target audience for this course consists of FHWA and state highway agency personnel in management, administrative, and engineering disciplines who will participate as Value Engineering team members. Consultants or agency representatives of all technical disciplines associated with project design, development, construction, and maintenance can be included in order to provide the multiple perspectives needed to maximize the effectiveness of the team.

TRAINING LEVEL: Basic

FEE: 2022: $1100 Per Person; 2023: $1100 Per Person
LENGTH: 4 DAYS (CEU: 2.4 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134005C

COURSE TITLE
Value Engineering Workshop (5-day)

Value Engineering (VE) is a systematic process of review and analysis of a project during the concept and design phases. VE is conducted by a multi-disciplined team of persons not involved in the project to provide recommendations such as: a) providing the needed functions safely, reliably, and at the lowest overall cost; b) improving the value and quality of the project; and c) reducing the time to complete the project.

This course begins with a Web-based training (WBT) component that is completed prior to the first day of the class (134005A). The 3-day workshop involves training participants to be valued contributors to the Value Engineering team, conducting a Value Engineering study in a team environment. It is preferable that the host agency provides actual project(s) to be used in this course, although The National Highway Institute (NHI) can provide projects upon request. Depending on the projects selected for use in the course, and based on the request of the host agency, the 5-day classroom session can be shortened to 3 or 4 days in length (NHI-134005 and NHI-134005B).

Upon successful course completion, participants will have acquired the training necessary to successfully participate in future Value Engineering studies for their agencies.

OUTCOMES
Upon completion of the course, participants will be able to:

- Explain how value engineering can improve project performance, reduce costs, and enhance value.
- Acquire the necessary behaviors and skills to be an effective Value Engineering Team member with the ability to: Investigate the project and analyze project functions and costs; Creatively speculate on alternative ways to perform the various functions; Evaluate the most effective life-cycle alternatives; Develop viable alternatives into fully supported recommendations; Present the recommendations to stakeholders and agency management

TARGET AUDIENCE
The target audience for this course consists of FHWA and state highway agency personnel in management, administrative, and engineering disciplines who will participate as Value Engineering team members. Consultants or agency representatives of all technical disciplines associated with project design, development, construction, and maintenance can be included in order to provide the multiple perspectives needed to maximize the effectiveness of the team.

TRAINING LEVEL: Basic

FEE: 2022: $1250 Per Person; 2023: $1250 Per Person
LENGTH: 5 DAYS (CEU: 3 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Value Engineering Workshop (3-day) VIRTUAL DELIVERY of 134005

Value Engineering (VE) is a systematic process of review and analysis of a project during the concept and design phases. VE is conducted by a multi-disciplined team of persons not involved in the project to provide recommendations such as: a) providing the needed functions safely, reliably, and at the lowest overall cost; b) improving the value and quality of the project; and c) reducing the time to complete the project.

This course begins with a Web-based training (WBT) component that is completed prior to the first day of the class (134005V). The 3-day ONLINE workshop involves training participants to be valued contributors to the Value Engineering team, conducting a Value Engineering study in a team environment. It is preferable that the host agency provides actual projects to be used in this course, although The National Highway Institute (NHI) can provide projects upon request. Depending on the projects selected for use in the course, and based on the request of the host agency, the 3-day classroom session can be expanded to 4 or 5 days in length (NHI-134005B/134005W) and NHI-134005C/134005X).

Upon successful course completion, participants will have acquired the training necessary to successfully participate in future Value Engineering studies for their agencies.

OUTCOMES

Upon completion of the course, participants will be able to:

- Explain how Value Engineering can improve project performance, reduce costs, and enhance value.
- Acquire the necessary behaviors and skills to be an effective Value Engineering team member with the ability to: Investigate the project and analyze project functions and costs; Creatively speculate on alternative ways to perform the various functions; Evaluate the most effective life-cycle alternatives; Develop viable alternatives into fully supported recommendations; Present the recommendations to stakeholders and agency management

TARGET AUDIENCE

The target audience for this course consists of FHWA and state highway agency personnel in management, administrative, and engineering disciplines who will participate as Value Engineering team members. Consultants or agency representatives of all technical disciplines associated with project design, development, construction, and maintenance can be included in order to provide the multiple perspectives needed to maximize the effectiveness of the team.

TRAINING LEVEL: Basic

FEE: 2022: $900 Per Person; 2023: $900 Per Person

LENGTH: 24 HOURS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134005W

Course Title
Value Engineering Workshop (4-day) VIRTUAL DELIVERY of 134005B

Value Engineering (VE) is a systematic process of review and analysis of a project during the concept and design phases. VE is conducted by a multi-disciplined team of persons not involved in the project to provide recommendations such as:
a) providing the needed functions safely, reliably, and at the lowest overall cost; b) improving the value and quality of the project; and c) reducing the time to complete the project.

This course begins with a Web-based training (WBT) component that is completed prior to the first day of the class (134005A). The 3-day workshop involves training participants to be valued contributors to the Value Engineering team, conducting a Value Engineering study in a team environment. It is preferable that the host agency provides actual project(s) to be used in this course, although The National Highway Institute (NHI) can provide projects upon request. Depending on the projects selected for use in the course, and based on the request of the host agency, the 3-day classroom session can be expanded to 4 or 5 days in length (NHI-134005B and NHI-134005C).

Upon successful course completion, participants will have acquired the training necessary to successfully participate in future Value Engineering studies for their agencies.

Outcomes
Upon completion of the course, participants will be able to:
• Explain how Value Engineering can improve project performance, reduce costs, and enhance value.
• Acquire the necessary behaviors and skills to be an effective Value Engineering team member with the ability to: Investigate the project and analyze project functions and costs; Creatively speculate on alternative ways to perform the various functions; Evaluate the most effective life-cycle alternatives; Develop viable alternatives into fully supported recommendations; Present the recommendations to stakeholders and agency management

Target Audience
The target audience for this course consists of FHWA and state highway agency personnel in management, administrative, and engineering disciplines who will participate as Value Engineering team members. Consultants or agency representatives of all technical disciplines associated with project design, development, construction, and maintenance can be included in order to provide the multiple perspectives needed to maximize the effectiveness of the team.

Training Level: Basic

Fee: 2022: $900 Per Person; 2023: N/A

Length: 32 Hours (CEU: 2.4 Units)

Class Size: Minimum: 15; Maximum: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Value Engineering Workshop (5-day) VIRTUAL DELIVERY of 134005C

Value Engineering (VE) is a systematic process of review and analysis of a project during the concept and design phases. VE is conducted by a multi-disciplined team of persons not involved in the project to provide recommendations such as: a) providing the needed functions safely, reliably, and at the lowest overall cost; b) improving the value and quality of the project; and c) reducing the time to complete the project.

This course begins with a Web-based training (WBT) component that is completed prior to the first day of the class (134005A). The 3-day workshop involves training participants to be valued contributors to the Value Engineering team, conducting a Value Engineering study in a team environment. It is preferable that the host agency provides actual project(s) to be used in this course, although The National Highway Institute (NHI) can provide projects upon request. Depending on the projects selected for use in the course, and based on the request of the host agency, the 3-day classroom session can be expanded to 4 or 5 days in length (NHI-134005B and NHI-134005C).

Upon successful course completion, participants will have acquired the training necessary to successfully participate in future Value Engineering studies for their agencies.

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain how Value Engineering can improve project performance, reduce costs, and enhance value.
• Acquire the necessary behaviors and skills to be an effective Value Engineering team member with the ability to: Investigate the project and analyze project functions and costs; Creatively speculate on alternative ways to perform the various functions; Evaluate the most effective life-cycle alternatives; Develop viable alternatives into fully supported recommendations; Present the recommendations to stakeholders and agency management

TARGET AUDIENCE
The target audience for this course consists of FHWA and state highway agency personnel in management, administrative, and engineering disciplines who will participate as Value Engineering team members. Consultants or agency representatives of all technical disciplines associated with project design, development, construction, and maintenance can be included in order to provide the multiple perspectives needed to maximize the effectiveness of the team.

TRAINING LEVEL: Basic

FEE: 2022: $900 Per Person; 2023: N/A

LENGTH: 40 HOURS (CEU: 3 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134006

Course Title
Utility Coordination for Highway Projects

This is a blended course, with both Web-based and instructor-led components. The Web-based training component (NHI 134006A) must be completed before attending the instructor-led training session.

Every State highway agency participates in construction projects that include accommodation and relocation of utilities along public rights-of-way. 134006 Utility Coordination for Highway Projects considers how communication, cooperation, and coordination between transportation agencies and utility companies can mitigate or avoid common challenges. Participants in this blended course (combination of Web-based and instructor-led formats) learn how, when, and where in the project development process to identify and conduct effective utility coordination.

Participants first take a self-paced, Web-based training to learn about regulatory requirements for both public and private utilities, subsurface utility engineering (SUE), and their own State's Utility Accommodation Policy. During the 2-day classroom event, participants learn to identify risks and potential issues associated with utilities, and then work together to evaluate ways to avoid or mitigate those risks and issues. (Please note: An optional lesson on utility challenges in projects using design-build delivery and other alternative contracting methods is available to be taught at the discretion of the State.) By putting these lessons into practice, utility-related complications in many cases can be predicted and mitigated at the most appropriate stage of project development, which can reduce potential negative impacts to timeline and budget.

Outcomes
Upon completion of the course, participants will be able to:

• Explain the importance of early and effective cooperation, communication, and coordination of utility-related activities throughout a project's lifecycle.
• Identify successful techniques that could be used to avoid or mitigate utility challenges throughout the project development and delivery process.
• Explain the major impacts of identified conflicts or issues on the schedule or budget of a project.
• Explain the basic skills necessary to identify utility conflicts and develop a utility conflict matrix.
• Generate a personal resource toolkit for each of six major areas of project development (planning, design, environmental considerations, right-of-way, construction, and maintenance).

Target Audience
The course targets Federal, State, and local personnel who are responsible for planning, designing, constructing, operating, and maintaining transportation facilities that involve the accommodation or relocation of utilities. It is most effectively delivered with participation from representatives of public and private utility companies, DOT contractors, risk managers, right-of-way staff, mid-to-senior level managers, and engineering consultants. The participation of utility company representatives in particular will be integral to the success of the course. Therefore, course organizers need to make every effort to include utility company personnel, as well as the Federal, State, and local transportation practitioners who comprise the more traditional audience for NHI training. Contractors and risk managers are appropriate and vital attendees as well. A minimum of 10% of every class should come from outside Federal, State, and local transportation agencies.

Training Level: Basic

Fee: 2022: $500 Per Person; 2023: $500 Per Person

Length: 2 DAYS (CEU: 1.2 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Introduction to Utility Coordination for Highway Projects

NHI 134006 is a blended course, with both Web-based and instructor-led components. The Web-based training component (NHI 134006A) must be completed before attending the instructor-led training session.

This training is a prerequisite of another NHI training and is offered at no cost.

Every State highway agency participates in construction projects that include accommodation and relocation of utilities along public rights-of-way. 134006 Utility Coordination for Highway Projects considers how communication, cooperation, and coordination between transportation agencies and utility companies can mitigate or avoid common challenges.

In the Web-based training, participants learn about regulatory requirements for both public and private utilities, subsurface utility engineering (SUE), and their own State's Utility Accommodation Policy. By putting these lessons into practice, utility-related complications in many cases can be predicted and mitigated at the most appropriate stage of project development, which can reduce potential negative impacts to timeline and budget.

OUTCOMES

Upon completion of the course, participants will be able to:

• Explain the importance of early and effective cooperation, communication, and coordination of utility-related activities throughout a project's lifecycle.
• Identify successful techniques that could be used to avoid or mitigate utility challenges throughout the project development and delivery process.
• Explain the major impacts of identified conflicts or issues on the schedule or budget of a project.

TARGET AUDIENCE

The course targets Federal, State, and local personnel who are responsible for planning, designing, constructing, operating, and maintaining transportation facilities that involve the accommodation or relocation of utilities. It is most effectively delivered with additional participation from representatives of public and private utility companies, DOT contractors, risk managers, right-of-way staff, mid-to senior-level managers, and engineering consultants.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 4 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134037A

COURSE TITLE
Managing Highway Contract Claims: Analysis and Avoidance

Construction contract claims are the result of the owner and the contractor being unable to come to agreement regarding an alleged change. Reducing or eliminating claims requires (1) a reduction in the number of potential changes, and (2) the implementation of practices that increase the likelihood of an owner and contractor resolving a dispute. This course provides the basic tools to address both elements of reducing or eliminating contract claims.

In this course, participants first walk step-by-step through the evaluation of a contract claim, looking at each component. Separate course modules are devoted to these three components of a claim: entitlement, impact, and cost. The “Entitlement” module focuses on the contract and the proper interpretation of common contract clauses. The “Impacts” module focuses on delay and inefficiency—the two most difficult impacts to measure and, consequently, most difficult to resolve. The “Cost” module explores costs that can prove difficult for the project team to resolve.

Next, the participants identify and review best practices associated with successful dispute resolution. In addition, there is a module devoted solely to claims avoidance techniques and dispute resolution processes.

By completing this course, participants will have the opportunity to master techniques that can help them manage and avoid claims.

OUTCOMES
Upon completion of the course, participants will be able to:

• Define “claim”
• List the three parts of a claim
• Describe the difference between a directed and constructive change
• List examples of directed and constructive changes
• List basic contract principles and rules of contract interpretation
• List the contract clauses most relevant to the evaluation of claims
• Define essential scheduling terms
• Explain the differences among the six types of delays
• List five methods for analyzing delays
• Explain how to perform a contemporaneous schedule analysis
• List five methods for measuring productivity/inefficiency
• Explain how to perform a measured mile analysis
• Describe how to avoid constructive acceleration
• List five methods for calculating costs
• List the four assumptions upon which a total cost calculation is based
• Identify project costs that are affected by delays
• Calculate extended home office overhead costs by the Eichleay and Canadian methods
• Identify acceleration costs
• Identify inefficiency costs
• Identify common miscellaneous costs
• Explain the key steps necessary to evaluate claims
• Describe the False Claims Act
• Demonstrate an ability to evaluate a contractor’s claim
• Describe FHWA policy regarding participation in paying damages for contractor claims
• Explain the importance of a claims avoidance system
• Describe a claims avoidance and dispute resolution system
• Explain the strengths and weaknesses of dispute review board

**TARGET AUDIENCE**

This an intermediate level course. It is designed specifically for State DOTs, but is also appropriate for LPOs and MPOs. It is a valuable course for contractors, design consultants, project managers, and attorneys involved in the evaluation, management, and resolution of disputes on highway construction projects.

**TRAINING LEVEL:** Intermediate

**FEE:** 2022: $800 Per Person; 2023: $900 Per Person

**LENGTH:** 2.5 DAYS (CEU: 1.5 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
NHI-134037A - Managing Highway Contract Claims: Analysis and Avoidance is now offered on-line as a virtual course. A virtual instructor-led training provides 100% remote learning while ensuring participants have access to expert instructors, workshop activities, and engaging peer-to-peer discussions. Register today and learn the principles of managing highway contract claims in the convenience of your home and/or office anywhere in the country, remotely.

Construction contract claims are the result of the owner and the contractor being unable to come to agreement regarding an alleged change. Reducing or eliminating claims requires (1) a reduction in the number of potential changes, and (2) the implementation of practices that increase the likelihood of an owner and contractor resolving a dispute. This course provides the basic tools to address both elements of reducing or eliminating contract claims and has been updated to include an increased focus on claims avoidance with improved examples and additional best practices with state-specific activity.

In this course, participants first walk step-by-step through the evaluation of a contract claim, looking at each component. Separate course modules are devoted to these three components of a claim: entitlement, impact, and cost. The “Entitlement” module focuses on the contract and the proper interpretation of common contract clauses. The “Impacts” module focuses on delay and inefficiency--the two most difficult impacts to measure and, consequently, most difficult to resolve. The “Cost” module explores costs that can prove difficult for the project team to resolve.

Next, the participants identify and review best practices associated with successful dispute resolution. In addition, there is a module devoted solely to claims avoidance techniques and dispute resolution processes.

By completing this course, participants will have the opportunity to master techniques that can help them manage and avoid claims.

Register today to learn best practices associated with successful managing construction contract claims in the convenience of your home and/or office anywhere in the country, remotely. Sessions are typically held as half-day events over four days.

OUTCOMES
Upon completion of the course, participants will be able to:

• Define common contract and construction management terms.
• Identify the three parts of a claim.
• Describe how to successfully evaluate change orders and potential disputes to reduce negative consequences for the agency
• Identify procedures and techniques for avoiding claims.

TARGET AUDIENCE
This an intermediate level course. It is designed specifically for State DOTs, but is also appropriate for LPOs and MPOs. It is a valuable course for contractors, design consultants, project managers, and attorneys involved in the evaluation, management, and resolution of disputes on highway construction projects.

TRAINING LEVEL: Intermediate

FEE: 2022: $800 Per Person; 2023: $900 Per Person

LENGTH: 16 HOURS (CEU: 1.5 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 32

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134049

COURSE TITLE
Successfully Managing Construction Scheduling and Risk

This course is designed for representatives from State Departments of Transportation (DOTs) and other contractor agencies. Specifically, this course expands the understanding of those individuals that are project engineers, inspectors, project managers, construction managers, resident engineers, and project administrators overseeing field construction, with 1-5 years of scheduling experience.

No prerequisite course is required. However, learners should have basic exposure to schedules and scheduling concepts and terminology. This course uses a new, completely different design and delivery approach from the previous NHI Scheduling instructor-led course. This course focuses on the journeyman or intermediate level participants who form the majority of resident and project engineers overseeing field construction (i.e., construction managers).

The course uses a gamified approach to WBT and prepares participants to use highway construction schedules for planning prior to construction and for managing the project during construction. Completing this course will enable the learner to advance their knowledge, skills, and abilities to manage a schedule as the owner from early project planning during design and carrying through construction execution.

OUTCOMES
Upon completion of the course, participants will be able to:
• Demonstrate how to validate that a project’s pre-bid schedule and specifications are reasonable and achievable.
• Determine the contractual acceptability of a contractor’s baseline schedule for a construction project.
• Determine whether a contractor’s schedule update is accurate, complete, and meets contract requirements.
• Determine strategies and tactics that ensure project progress meetings are effective for proactively collaborating with the contractor to meet the contract schedule.
• Demonstrate how to assess proposed time extensions for reasonableness and implications.

TARGET AUDIENCE
State Departments of Transportation (DOTs) and other contractor agencies. Specifically, this course expands the understanding of those individuals that are project engineers, inspectors, project managers, construction managers, resident engineers, and project administrators overseeing field construction, with 1-5 years of scheduling experience.

TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 4 HOURS (CEU: .4 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134063

Course Title
Maintenance Leadership Academy

The Maintenance Leadership Academy (MLA) provides an intensive training program to individuals who hold positions as State, district, and county maintenance supervisors, superintendents, and managers. The MLA is an investment in an employee’s role as a leader and mentor that helps agencies become more efficient and innovative. The MLA decreases the time it takes to acclimate new managers, improves decision-making, and supports workforce development.

Participants acquire an understanding of the various processes, methods, and materials that are applied to maintain and preserve their organization’s bridge and highway systems. Participants develop a knowledge base of planning, scheduling, quality control, customer focus, program presentation, asset management, pavement and bridge preservation, contract management, and performance improvement. Completion requirements include:

- Enroll and attend a 1-hour Orientation Web-conference
- Complete 16.75 hours of independent study via paper-based study and web-based training modules
- Attend 10.5 days of instructor-led, classroom training

See sample outcomes below for each of the six modules that comprise the MLA.

NOTE: Interested hosts should submit their course requests at least three-four months in advance of the desired start date. Contact NHI with any questions about the MLA course structure.

Outcomes
Upon completion of the course, participants will be able to:

• Lead a performance-based maintenance culture that supports data-driven decision-making and achieves quality results in all areas of maintenance work. (Module A)
• Select the most appropriate candidates and treatment for pavement and bridge distress conditions and to make sure the agency gets the best performance and value from pavement and bridge maintenance expenditures. (Module B)
• Manage their roadside and drainage assets proactively and effectively to get the most out of the resources expended and extend the life of roadside, pavement, and bridge assets. (Module C)
• Promote and deliver environmental compliance, stewardship, and sustainability in their organization and with their staff members. (Module D)
• Develop, implement, and manage a comprehensive, risk-based plan for weather-related events. (Module E)
• Support traffic services and establish work zones that comply with agency guidance under normal traffic conditions and traffic incidents. (Module F)

Target Audience
This course was designed for State, regional, or county personnel who manage highway maintenance programs and deal with oversight and quality assurance over broad geographic areas. They are involved with handling materials, scheduling, budgeting, and planning. Participants have an advanced skill in maintenance activities.

Training Level: Accomplished

Fee: 2022: $1995 Per Person; 2023: $2195 Per Person

Length: 10.5 DAYS (CEU: 8 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
 COURSE NUMBER
FHWA-NHI-134063A

 COURSE TITLE
Maintenance Leadership Academy - Module A Maintenance Administration
(VIRTUAL DELIVERY-EXAM ONLY)

The Maintenance Academy will provide an extensive/intensive training program to individuals who hold positions as District, County and State maintenance supervisors. The participants will acquire an understanding of the various processes, methods, and materials that are applied to maintain their organization’s bridge and highway systems. Participants will develop a knowledge base of personnel management, materials selection, equipment use, and applicable methods to react to problems in bridges, roadways, budgeting, and planning.

This curriculum will assist departments that are experiencing high turnover rates and want to decrease the time for acclimating new managers. The training will provide an opportunity for career development, highlighting the changes that have occurred over the past 20 years and the future of the Highway Maintenance field.

The Academy curriculum consists of self-paced lessons, Web conference training, and classroom sessions. Self-paced lessons are completed prior to attending the 3-week classroom session and are delivered both in Web-based and paper-based formats. Upon enrolling for the Maintenance Leadership Academy, participants will be invited to attend a 1-hour orientation Web conference that will provide an overview of the Academy’s schedule and information on how to access the self-paced lessons.

OUTCOMES

Upon completion of the course, participants will be able to:

• Communicate a justification for a budget to supervisors, legislators and managers, the public, and to the local workforce staff
• Express the desired process and expectations of an assigned maintenance activity or program
• Organize strategic and tactical tools to execute maintenance programs
• Demonstrate the components of quality service utilizing the maintenance program
• Calculate performance and results data for agency reporting

TARGET AUDIENCE

The target audience for this course is regional, state-wide, or county personnel who manage operations programs and deal with oversight and quality assurance over broader geographic areas. They are involved with handling materials, scheduling, budgeting and planning. Participants have an advanced skill in maintenance activities. Participants enrolling in the Academy will need to have taken NHI-134064 “Transportation Construction Quality Assurance” and NHI-131110 “Pavement Preservation Treatment Construction” or had equivalent training or experience in these content areas.

TRAINING LEVEL: Accomplished

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 4.5 DAYS (CEU: 2.7 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134063G

Course Title
Maintenance Leadership Academy (Course Materials)

IMPORTANT NOTICE: NHI 134063-G is the online curriculum attached to the Maintenance Leadership Academy. You must be enrolled in a current session of Maintenance Leadership Academy to register for NHI 134063-G. If you are not enrolled in Maintenance Leadership Academy and would like to take the series of Web-based trainings, please register for NHI 134109 Maintenance Training Series. If you complete the NHI 134063-G courses without being enrolled in the Maintenance Leadership Academy, you will not receive credit or certificates for the online curriculum. Anyone outside of the current Maintenance Leadership Academy sessions, please register for NHI 134109.

The Maintenance Leadership Academy provides an intensive training program to individuals who hold positions as State, district, and county maintenance supervisors. The Academy can help decrease the time it takes to acclimate new managers and provide an opportunity for career development.

Participants acquire an understanding of the various processes, methods, and materials that are applied to maintain their organization's bridge and highway systems. Participants develop a knowledge base of personnel management, materials selection, equipment use, and applicable methods to react to problems in bridges, roadways, budgeting, and planning.

The curriculum consists of self-paced lessons accessed via the Web and classroom sessions. Self-paced lessons are completed prior to attending each of the two classroom sessions. Upon enrolling for the Maintenance Leadership Academy, participants attend a 1-hour orientation Web conference that provides an overview of the Academy's schedule and information on how to access the self-paced lessons.

An example of the structure of the Academy:
- Enroll and attend a 1-hour Web conference orientation
- Complete 22 hours of independent study materials
- Attend 8 days of classroom training
- Complete 10.5 hours of independent study material and attend a 1-hour homework review Web conference
- Attend the final 4 days of classroom training

Outcomes
Upon completion of the course, participants will be able to:
- Describe the use of maintenance administration in achieving highway agency goals. (Module A)
- Describe how various treatments fit into an overall system preservation program and when to implement them. (Module B)
- Identify appropriate drainage maintenance and roadside management techniques. (Module C)
- Describe the maintenance manager's roles and responsibilities for developing, implementing, and managing a comprehensive plan for dealing with weather-related events. (Module D)
- Explain the maintenance and use of traffic control devices (including work zone plans, work zone traffic control devices, signs, striping, guardrails, and median barriers) in maintenance operations. (Module E)
- Describe how environmental protection issues, regulations and control measures affect highway maintenance activities. (Module F)

Target Audience
This course was designed for State, regional, or county personnel who manage operations programs and deal with oversight and quality assurance over broader geographic areas. They are involved with handling materials, scheduling, budgeting and planning. Participants have an advanced skill in maintenance activities. Participants enrolling in the Academy will need to have taken NHI-134064 “Transportation Construction Quality Assurance” and NHI-131110 “Pavement Preservation Treatment Construction” or had equivalent training or experience in these content areas.
TRAINING LEVEL: Accomplished

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 32.5 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 31

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134069

COURSE TITLE
Ethics Awareness for the Transportation Industry

The training contains good practices from various agencies. The topics of discussion in this training are: conflict of interest, safety, fraud, falsification of documentation, reporting ethical concerns, gifts and favors, fairness, personal use of agency property, and consequences.

Not all State agencies’ codes of conduct are the same but they all demand similar ethical behavior of their employees. Be sure to access to your agency’s codes or check with your supervisor for more information specific to your organization. Each State agency/company has its own work rules, which the viewer needs to review and follow.

This training is provided in partnership with the Transportation Curriculum Coordination Council (TCCC) to provide good practices for ethical behavior of transportation employees. The training was prepared by State DOT personnel for State DOT personnel. This course is primarily intended for inspectors and technicians.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe agency expectations on ethics
• Give an example of a current code of conduct policy
• Recognize and practice good ethics as an employee in the transportation industry
• Explain the consequences when rules and regulations are not followed

TARGET AUDIENCE
This training is designed for Level I and Level II State and local public agency personnel and their industry counterparts involved in the construction, maintenance and testing process for highways and structures. Level I or Entry refers to employees/trainees with little to no experience in the subject area and perform his/her activities under direct supervision. Level II or Intermediate refers to employees that understand and demonstrate skills in one or more areas of the entry level and perform specific tasks under general supervision.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person
LENGTH: 1 HOURS (CEU: 0 UNITS)
CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134071

COURSE TITLE
Basic Construction and Maintenance Documentation - Improving the Daily Diary

This training is provided by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to help improve documentation on construction and maintenance projects. The training was prepared by State DOT personnel for State DOT personnel. This course is primarily intended for inspectors and technicians.

It contains good practices from various agencies. This training is intended to assist you with proper documentation on a construction or maintenance project. It is important that the information in the daily diary kept for projects are accurate, correct, and factual to insure proper payment and to avoid lawsuits.

Please note that the terminology may differ slightly from DOT to DOT; for example, the document may also be referred to as a Daily Work Report. Each State agency/company has its own requirements, which the viewer needs to review and follow.

OUTCOMES
Upon completion of the course, participants will be able to:

• Compose a complete and correct daily diary
• Recognize the importance of daily diary entries

TARGET AUDIENCE
This training is designed for Level I and Level II State and local public agency personnel and their industry counterparts involved in the construction, maintenance and testing process for highways and structures. Level I or Entry refers to employees/trainees with little to no experience in the subject area and perform his/her activities under direct supervision. Level II or Intermediate refers to employees that understand and demonstrate skills in one or more areas of the entry level and perform specific tasks under general supervision.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134077

COURSE TITLE
Contract Administration Core Curriculum

More than 10,000 Federal-aid construction contracts are authorized by FHWA each year. Those contracts are subsequently administered by State departments of transportation and local public agencies that may not be familiar with FHWA's complex requirements for construction contracts. Recent FHWA program reviews of projects administered by local public agencies indicated that contract administration is a continuing high-risk area that needs additional focus.

Therefore, a newly revised, 2-day instructor-led training course was developed in concert with updates and revisions to the Contract Administration Core Curriculum (CACC) Manual (revised October 2014). The training was developed to explain basic Federal-aid requirements; promote awareness of FHWA policy; facilitate familiarity with the newly reorganized, revised, and expanded CACC manual; and allow supervised practice activities using the manual to find information. By engaging in a variety of in-class exercises and case studies, participants become quite familiar with the CACC Manual and learn how to best use it as a daily resource.

A basic understanding of the background and structure of the Federal-aid Highway Program (FAHP) is required for participants attending this course. Participants who are new to administering Federal-aid contracts should take NHI introductory course (NHI 310110 Federal-aid 101) to the Federal-aid Highway Program prior to attending CACC course. Anyone needing a refresher on the FAHP is encouraged to take the course as well.

Prior to attending class, all participants are expected to watch the Federal-aid Essentials video Stewardship and Oversight. This video is approximately 8.5-minutes long and can be accessed at www.fhwa.dot.gov/federal-aidessentials/.

OUTCOMES
Upon completion of the course, participants will be able to:

- Use the Contract Administration Core Curriculum Manual (CACC) and other FHWA resources in order to answer questions regarding program-level and project-level requirements on Federal Aid (FA) projects
- Describe the impact program-level contract requirements have on individual FA projects
- Identify the contract requirements associated with administering FA projects for Federal and State entities at the pre-award, advertising and award, and post-award and constructions stages

TARGET AUDIENCE
This course is designed for Federal Highway Administration (FHWA) Division Office personnel who must read, interpret, and apply Federal regulations and guidance that affects administration of Federal-aid contracts, as well as any State and local government agency personnel who must interpret and apply Federal regulations and guidance that affects administration of Federal-aid contracts.

TRAINING LEVEL: Basic

FEE: 2022: $200 Per Person; 2023: $200 Per Person

LENGTH: 2 DAYS (CEU: 1.3 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134080

COURSE TITLE
Environmental Factors in Construction and Maintenance

NOTE: This course is intended for highway construction inspectors, maintenance supervisors, and other inspection and field personnel.

This is a blended course that comprises approximately 6 hours of independent study work and a 1.5-day instructor-led session. Participants must complete the independent study materials before attending the instructor-led session.

Mandated environmental considerations are an important part of all highway agencies' roadway construction and maintenance activities. NHI 134080 Environmental Factors in Construction and Maintenance focuses on balancing the need to fulfill environmental protections and the need to complete project activities in a safe, timely, and financially responsible manner.

This course emphasizes common environmental agency regulations, adherence to plans, early and frequent communication regarding construction and maintenance commitments, and the potential for encountering unexpected issues. Course activities help participants understand how to build environmental considerations into their standard practice. Learning to relate environmental commitments to construction and maintenance processes and practices can help transportation personnel ensure compliance with numerous and increasingly complex Federal, State, and local environmental regulations.

Course content is delivered via approximately 6 hours of independent study workbook materials and a 1.5-day classroom-based, instructor-led session. Two FHWA instructors relate their construction experience and environmental knowledge to help ensure that participants in this course will be able to apply the training content immediately to their projects and duties.

OUTCOMES
Upon completion of the course, participants will be able to:

• Relate design-phase environmental commitments to construction documents
• Explain your role in early and continuous communication to support commitments that occurred during design phase
• Recognize the importance of environmental protection during construction and maintenance operations
• Describe quality control measures and documentation that can be implemented through the construction sequence to provide environmental mitigation measures
• Recognize the role of the project inspectors (and environmental inspectors, when used) in addressing environmental issues
• Describe a variety of environmental compliance and commitment tracking tools
• Identify resources for consultation on environmental issues

TARGET AUDIENCE
This course is intended primarily for Federal, State, and local highway construction inspectors, maintenance supervisors, and other inspection and field personnel who must ensure that identified environmental impacts are mitigated during construction and maintenance operations. This may include FHWA employees, as well as State employees and local agencies and consultants that oversee such activities.

TRAINING LEVEL: Basic

FEE: 2022: $300 Per Person; 2023: $300 Per Person
LENGTH: 1.5 DAYS (CEU: 1.5 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134097

Course Title
Fresh Concrete Properties

This training is provided by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to review integrated materials and construction practices for concrete pavement. The training was developed by the National Concrete Pavement Technology Center at Iowa State University. This training is recommended for the Transportation Curriculum Coordination Council levels III and IV. This course is primarily intended for inspectors and technicians.

This module covers the properties of fresh concrete needed to produce high-quality, long-lasting pavements and how to monitor these properties.

This module is part of a curriculum from the “Integrated Materials and Construction Practices for Concrete Pavement” manual developed through the National Concrete Pavement Technology Center at Iowa State University. The other Web-based training modules include:

- FHWA-NHI-134075 TCCC Hardened Concrete Properties - Durability
- FHWA-NHI-134084 TCCC Fundamentals of Materials Used for Concrete Pavements
- FHWA-NHI-134085 TCCC Incompatibility in Concrete Pavement Systems
- FHWA-NHI-134087 TCCC Mix Design Principles
- FHWA-NHI-134095 TCCC Early Age Cracking
- FHWA-NHI-134096 TCCC Basics of Cement Hydration
- FHWA-NHI-134098 TCCC Construction of Concrete Pavements
- FHWA-NHI-134100 TCCC QCQA for Concrete Pavements
- FHWA-NHI-134101 TCCC Design of Pavement
- FHWA-NHI-134102 TCCC Troubleshooting for Concrete Pavements

Outcomes

Upon completion of the course, participants will be able to:
- List the main properties of fresh concrete
- Describe what affects each property
- Recognize how to monitor these properties through concrete testing

Target Audience

This training is designed for FHWA, State, and local agencies and their industry counterparts involved in the process to assure that the properties of a concrete mixture provide ease in placement, ease of consolidation, and long-lasting pavement. It is applicable to anyone desiring a better understanding of the properties of Portland cement concrete.

Training Level: Intermediate

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 1 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134101

COURSE TITLE
Design of Pavement

This training is provided by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to review integrated materials and construction practices for concrete pavement. The training was developed by the National Concrete Pavement Technology Center at Iowa State University. This training is recommended for the Transportation Curriculum Coordination Council levels III and IV. This course is primarily for inspectors and technicians.

This module covers pavement design and subgrade concepts as they relate to materials and construction. It does not provide sufficient detail to actually design or evaluate a design. It covers the primary goal of pavement design, which is to provide a pavement with the following characteristics: safe, long lasting, cost effective, low maintenance, and constructible.

This module is part of a curriculum from the “Integrated Materials and Construction Practices for Concrete Pavement” manual developed through the National Concrete Pavement Technology Center at Iowa State University. The other Web-based training modules include:

- FHWA-NHI-134075 TCCC Hardened Concrete Properties - Durability
- FHWA-NHI-134084 TCCC Fundamentals of Materials Used for Concrete Pavements
- FHWA-NHI-134085 TCCC Incompatibility in Concrete Pavement Systems
- FHWA-NHI-134087 TCCC Mix Design Principles
- FHWA-NHI-134095 TCCC Early Age Cracking
- FHWA-NHI-134096 TCCC Basics of Cement Hydration
- FHWA-NHI-134097 TCCC Fresh Concrete Properties
- FHWA-NHI-134098 TCCC Construction of Concrete Pavements
- FHWA-NHI-134100 TCCC QCQA for Concrete Pavements
- FHWA-NHI-134102 TCCC Troubleshooting for Concrete Pavements

OUTCOMES
Upon completion of the course, participants will be able to:
- Identify pavement types and design features
- Recognize what design variables are controlled by field operations
- Discuss the two primary types of pavement distresses (performance measures)
- Recognize how subgrades and bases effect construction operations and long-term pavement performance

TARGET AUDIENCE
This training is designed for FHWA, State, and local agencies and their industry counterparts involved in designing, constructing, and inspecting Portland cement concrete pavements.

TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
**COURSE NUMBER**  
FHWA-NHI-134105

**COURSE TITLE**  
Pipe Installation, Inspection, and Quality

This training was developed by the Transportation Curriculum Coordination Council (TCCC) in partnership with State DOT personnel. It helps transportation professionals involved in the installation, inspection, and quality of pipe on highway construction projects improve their understanding of the factors that contribute to high-quality installations. The training was prepared by State DOT personnel for State DOT personnel. It contains good practices from various agencies. Each State agency/company has its own specifications, which the viewer needs to review and follow for the specified pipe. This course is primarily intended for inspectors and technicians.

This course is focused on the three basic pipe materials. They are Concrete, Metal, and Plastic. This course contains important instructional material, procedures and guidance that has been developed to maintain uniformity among pipe inspectors. This course will cover what you need to know, do, and look for during the inspection of pipe installation.

This training is directed toward intermediate level technicians, to give them an in-depth view of the basic materials used in pipe construction. The course modules will address the different types of pipe as well as the foundation work, bedding selection, placement, joint sealants, backfilling and documentation for concrete, metal and plastic pipe.

**OUTCOMES**

Upon completion of the course, participants will be able to:

- Identify basic material pipe types
- Recognize proper foundation and bedding requirements for pipe
- Link different types of pipe with its required specifications for installation
- Identify common errors to avoid when dealing with placement, joints and backfilling of pipe
- Recognize the importance of accurate records and reporting

**TARGET AUDIENCE**

This course targets field personnel involved in all aspects of highway construction from engineers to technicians. The ideal audience will have a mix of experience and responsibility levels so that agency-specific practices can be shared by more experienced participants with those who are newer to the field. The course materials also are appropriate for project manager/resident engineer involvement.

**TRAINING LEVEL:** Intermediate

**FEE:** 2022: $0 Per Person; 2023: $0 Per Person

**LENGTH:** 7 HOURS (CEU: 0 UNITS)

**CLASS SIZE:** MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134106

COURSE TITLE
Basic Construction Surveying

This training was prepared by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to review the basics of construction surveying. This training has been prepared to provide guidance and instruction to those involved in construction surveying. The important surveying tasks involved in this work and the surveying procedures to be followed are also described in this training. This course is primarily intended for inspectors and technicians. This training is targeted for those who are new to the construction surveying experience or for anyone needing a refresher. This training is recommended for the Transportation Curriculum Coordination Council levels I and II.

We've broken this training into three modules:
1. Basic Surveying Concepts
2. Measurement and Construction Surveying
3. Survey Mathematics

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe basic surveying concepts
• Understand measurement and construction surveying
• List the instruments and techniques used in measurement
• Perform stationing and staking operations
• Perform basic survey mathematics

TARGET AUDIENCE
This training is designed for FHWA, State, and local agencies and their industry counterparts involved in construction survey. This training is targeted for those who have not had construction surveying experience or anyone needing a review over the key concepts of surveying.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 3 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134108

COURSE TITLE
Plan Reading Series

The Transportation Curriculum Coordination Council (TCCC) in partnership with NHI is pleased to offer this comprehensive training series (FHWA-NHI-134108) for highway plan reading. This training is recommended for the Transportation Curriculum Coordination Council levels II - IV. This course is primarily intended for inspectors and technicians.

The ability to read plans is essential for anyone involved in highway and/or bridge construction. This training contains modules covering both basic plan reading instructions, as well as, providing a more in-depth level of instruction for anyone seeking more information and/or a review of plan reading.

To streamline registration and enable you to take some or all of these trainings when it best suits your schedule, we have created this new series option which automatically registers you for all 8 modules—it's that easy. They are as follows:

Module 1: Highway Plan Reading Basics (134108A) - This module describes the foundational information needed to begin reading and understanding highway plans. This includes an overview of the title page and its components, station numbers, townships, and quantity estimates.

Module 2: Grading Plans (134108B) - This module reviews the information found in the Grading Plans (sheets that begin with “B”) section of a highway plan.

Module 3: Traffic Control Plans (134108C) - This module reviews the information found in the Traffic Control Plans (sheets that begin with “C”) section of a highway plan.

Module 4: Erosion and Sediment Control Plans (134108D) - This module reviews the information found in the Erosion and Sediment Control Plans (sheets that begin with “D”) section of a highway plan.

Module 5: Right of Way Plans (134108E) - This module reviews the information found in Right-of-Way Plans for a highway project.

Module 6: County Plans (134108F) - This module reviews the information found in a county plan.

Module 7: Bridge Plans (134108G) - This module reviews the information found in a bridge plan.

Module 8: Culvert Plans (134108H) - This module reviews the information found in a culvert plan.

OUTCOMES

Upon completion of the course, participants will be able to:

• Recognize plan sheets for highway, county, bridge, culvert construction

• Recognize station locations and calculate; cross section, profile, and plan views; centerline location; point of intersection; and a variety of plan details

• Recognize plan sheet for all parts of both a bridge substructure and superstructure

• Comprehend the terminology and symbols used when reading plans

TARGET AUDIENCE

This training is designed for FHWA, State, and local agencies and their industry counterparts involved in the construction process of highways, county, bridges, or culverts. It is applicable to anyone desiring a better understanding of plan reading.
TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 8 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134108A

Course Title
Plan Reading: Highway Plan Reading Basics

This training is provided by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to review the basics for highway plan reading. This course is recommended for the Transportation Curriculum Coordination Council levels II - IV. This course is primarily intended for inspectors and technicians.

The ability to read plans is essential for anyone involved in highway and/or bridge construction. This training describes the foundational information needed to begin reading and understanding highway plans. This includes an overview of the title page and its components, station numbers, townships, and quantity estimates.

This training is part of the curriculum from the Plan Reading Series (FHWA-NHI-134108) which covers both basic plan reading instructions, as well as, providing a more in-depth level of instruction for anyone seeking more information and/or a review of plan reading. The other Web-based training modules include:

- FHWA-NHI-134108B Grading Plans
- FHWA-NHI-134108C Traffic Control Plans
- FHWA-NHI-134108D Erosion and Sediment Control Plans
- FHWA-NHI-134108E Right-of-Way Plans
- FHWA-NHI-134108F County Plans
- FHWA-NHI-134108G Bridge Plans
- FHWA-NHI-134108H Culvert Plans

Outcomes

Upon completion of the course, participants will be able to:

- Describe the components of a plan’s title sheet
- Calculate the distance between two station numbers
- Explain how a township is designated in a plan
- Identify quantity estimates for given supplies and materials

Target Audience

This training is designed for FHWA, State, and local agencies and their industry counterparts involved in the construction process of highways and/or bridges. It is applicable to anyone desiring a better understanding of plan reading.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 1 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134108B

Course Title
Plan Reading: Grading Plans

This training is provided by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to review the basics for highway plan reading. This course is recommended for the Transportation Curriculum Coordination Council levels II - IV. This course is primarily intended for inspectors and technicians.

The ability to read plans is essential for anyone involved in highway and/or bridge construction. This training reviews the information found in the Grading Plans (sheets that begin with “B”) section of a highway plan.

This training is part of the curriculum from the Plan Reading Series (FHWA-NHI-134108) which covers both basic plan reading instructions, as well as, providing a more in-depth level of instruction for anyone seeking more information and/or a review of plan reading. The other Web-based training modules include:

- FHWA-NHI-134108A Highway Plan Reading Basics
- FHWA-NHI-134108C Traffic Control Plans
- FHWA-NHI-134108D Erosion and Sediment Control Plans
- FHWA-NHI-134108E Right-of-Way Plans
- FHWA-NHI-134108F County Plans
- FHWA-NHI-134108G Bridge Plans
- FHWA-NHI-134108H Culvert Plans

Outcomes
Upon completion of the course, participants will be able to:

- Describe the information provided in the grading plans
- Identify grade characteristics provided in the typical grading sections sheets
- Explain the importance of plan and profile sheets
- Describe the different elements that can be depicted in plan and profile sheets

Target Audience
This training is designed for FHWA, State, and local agencies and their industry counterparts involved in the construction process of highways and/or bridges. It is applicable to anyone desiring a better understanding of plan reading.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 1.5 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134108C

Course Title
Plan Reading: Traffic Control Plans

This training is provided by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to review the basics for highway plan reading. This course is recommended for the Transportation Curriculum Coordination Council levels II - IV. This course is primarily intended for inspectors and technicians.

The ability to read plans is essential for anyone involved in highway and/or bridge construction. This training reviews the information found in the Traffic Control Plans (sheets that begin with “C”) section of a highway plan.

This training is part of the curriculum from the Plan Reading Series (FHWA-NHI-134108) which covers both basic plan reading instructions, as well as, providing a more in-depth level of instruction for anyone seeking more information and/or a review of plan reading. The other Web-based training modules include:

- FHWA-NHI-134108A Highway Plan Reading Basics
- FHWA-NHI-134108B Grading Plans
- FHWA-NHI-134108D Erosion and Sediment Control Plans
- FHWA-NHI-134108E Right-of-Way Plans
- FHWA-NHI-134108F County Plans
- FHWA-NHI-134108G Bridge Plans
- FHWA-NHI-134108H Culvert Plans

Outcomes
Upon completion of the course, participants will be able to:

- Describe the information provided in the traffic control plans
- Identify signs to be used in the project
- Identify sign locations

Target Audience
This training is designed for FHWA, State, and local agencies and their industry counterparts involved in the construction process of highways and/or bridges. It is applicable to anyone desiring a better understanding of plan reading.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: .5 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134108D

COURSE TITLE
Plan Reading: Erosion and Sediment Control Plans

This training is provided by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to review the basics for highway plan reading. This course is recommended for the Transportation Curriculum Coordination Council levels II - IV. This course is primarily intended for inspectors and technicians.

The ability to read plans is essential for anyone involved in highway and/or bridge construction. This training reviews the information found in the Erosion and Sediment Control Plans (sheets that begin with “D”) section of a highway plan.

This training is part of the curriculum from the Plan Reading Series (FHWA-NHI-134108) which covers both basic plan reading instructions, as well as, providing a more in-depth level of instruction for anyone seeking more information and/or a review of plan reading. The other Web-based training modules include:

FHWA-NHI-134108A Highway Plan Reading Basics
FHWA-NHI-134108B Grading Plans
FHWA-NHI-134108C Traffic Control Plans
FHWA-NHI-134108E Right-of-Way Plans
FHWA-NHI-134108F County Plans
FHWA-NHI-134108G Bridge Plans
FHWA-NHI-134108H Culvert Plans

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the information provided in the erosion and sediment control plans
• Explain the erosion and sediment control items used in the plan

TARGET AUDIENCE
This training is designed for FHWA, State, and local agencies and their industry counterparts involved in the construction process of highways and/or bridges. It is applicable to anyone desiring a better understanding of plan reading.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: .5 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134108E

COURSE TITLE
Plan Reading: Right-of-Way Plans

This training is provided by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to review the basics for highway plan reading. This course is recommended for the Transportation Curriculum Coordination Council levels II - IV. This course is primarily intended for inspectors and technicians.

The ability to read plans is essential for anyone involved in highway and/or bridge construction. This training reviews the information found in right-of-way plans for a highway project.

This training is part of the curriculum from the Plan Reading Series (FHWA-NHI-134108) which covers both basic plan reading instructions, as well as, providing a more in-depth level of instruction for anyone seeking more information and/or a review of plan reading. The other Web-based training modules include:

FHWA-NHI-134108A Highway Plan Reading Basics
FHWA-NHI-134108B Grading Plans
FHWA-NHI-134108C Traffic Control Plans
FHWA-NHI-134108D Erosion and Sediment Control Plans
FHWA-NHI-134108F County Plans
FHWA-NHI-134108G Bridge Plans
FHWA-NHI-134108H Culvert Plans

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain the purpose of right-of-way plans
• Explain when right-of-way is needed
• Describe the information provided in right-of-way plans
• Describe when land is acquired for easements
• Explain how parcels are used in right-of-way plans
• Describe how utilities will be handled for the project

TARGET AUDIENCE
This training is designed for FHWA, State, and local agencies and their industry counterparts involved in the construction process of highways and/or bridges. It is applicable to anyone desiring a better understanding of plan reading.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person
LENGTH: 1 HOURS (CEU: 0 UNITS)
CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134108F

COURSE TITLE
Plan Reading: County Plans

This training is provided by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to review the basics for highway plan reading. This course is recommended for the Transportation Curriculum Coordination Council levels II - IV. This course is primarily intended for inspectors and technicians.

The ability to read plans is essential for anyone involved in highway and/or bridge construction. This training reviews the information found in a county plan.

This training is part of the curriculum from the Plan Reading Series (FHWA-NHI-134108) which covers both basic plan reading instructions, as well as, providing a more in-depth level of instruction for anyone seeking more information and/or a review of plan reading. The other Web-based training modules include:

- FHWA-NHI-134108A Highway Plan Reading Basics
- FHWA-NHI-134108B Grading Plans
- FHWA-NHI-134108C Traffic Control Plans
- FHWA-NHI-134108D Erosion and Sediment Control Plans
- FHWA-NHI-134108E Right-of-Way Plans
- FHWA-NHI-134108G Bridge Plans
- FHWA-NHI-134108H Culvert Plans

OUTCOMES
Upon completion of the course, participants will be able to:

- Describe the information provided in a county plan
- Given a county plan, explain the details of the project

TARGET AUDIENCE
This training is designed for FHWA, State, and local agencies and their industry counterparts involved in the construction process of highways and/or bridges. It is applicable to anyone desiring a better understanding of plan reading.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134108G

Course Title
Plan Reading: Bridge Plans

This training is provided by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to review the basics for highway plan reading. This course is recommended for the Transportation Curriculum Coordination Council levels II - IV. This course is primarily intended for inspectors and technicians.

The ability to read plans is essential for anyone involved in highway and/or bridge construction. This training reviews the information found in a bridge plan.

This training is part of the curriculum from the Plan Reading Series (FHWA-NHI-134108) which covers both basic plan reading instructions, as well as, providing a more in-depth level of instruction for anyone seeking more information and/or a review of plan reading. The other Web-based training modules include:

- FHWA-NHI-134108A Highway Plan Reading Basics
- FHWA-NHI-134108B Grading Plans
- FHWA-NHI-134108C Traffic Control Plans
- FHWA-NHI-134108D Erosion and Sediment Control Plans
- FHWA-NHI-134108E Right-of-Way Plans
- FHWA-NHI-134108F County Plans
- FHWA-NHI-134108H Culvert Plans

Outcomes

Upon completion of the course, participants will be able to:

- Identify the major components of a bridge structure
- Describe the information provided in a bridge plan
- Using a bridge plan, explain details of the project

Target Audience

This training is designed for FHWA, State, and local agencies and their industry counterparts involved in the construction process of highways and/or bridges. It is applicable to anyone desiring a better understanding of plan reading.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 1.5 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134108H

COURSE TITLE
Plan Reading: Culvert Plans

This training is provided by the Transportation Curriculum Coordination Council (TCCC) in partnership with NHI to review the basics for highway plan reading. This course is recommended for the Transportation Curriculum Coordination Council levels II - IV. This course is primarily intended for inspectors and technicians.

The ability to read plans is essential for anyone involved in highway and/or bridge construction. This training reviews the information found in a culvert plan.

This training is part of the curriculum from the Plan Reading Series (FHWA-NHI-134108) which covers both basic plan reading instructions, as well as, providing a more in-depth level of instruction for anyone seeking more information and/or a review of plan reading. The other Web-based training modules include:

- FHWA-NHI-134108A Highway Plan Reading Basics
- FHWA-NHI-134108B Grading Plans
- FHWA-NHI-134108C Traffic Control Plans
- FHWA-NHI-134108D Erosion and Sediment Control Plans
- FHWA-NHI-134108E Right-of-Way Plans
- FHWA-NHI-134108F County Plans
- FHWA-NHI-134108G Bridge Plans

OUTCOMES
Upon completion of the course, participants will be able to:

- Identify the major components of a culvert
- Describe the information provided in a culvert plan
- Using a culvert plan, explain details of the project

TARGET AUDIENCE
This training is designed for FHWA, State, and local agencies and their industry counterparts involved in the construction process of highways and/or bridges. It is applicable to anyone desiring a better understanding of plan reading.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1.5 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134109

Course Title
Maintenance Training Series

The Maintenance Training Series was created to train individuals responsible for the maintenance of our Nation’s roadways. The series consists of 11 self-paced, Web-based trainings (WBTs) on various maintenance operations topics, ranging from the conceptual (pavement preservation) to the practical (management of underground storage tanks). The trainings included in the series are listed below and each will take approximately 1 hour to complete.

Participants who wish to complete all 11 trainings in the Maintenance Training Series should enroll in course 134109. Those who are interested in specific topics may enroll in each training individually.

- Pavement Preservation Program (134109A)
- Shaping and Shoulders (134109B)
- Thin HMA Overlays and Leveling (134109C)
- Base and Subbase Stabilization and Repair (134109D)
- Drainage (134109E)
- Outdoor Advertising and Litter Control (134109F)
- Roadside Vegetation Management (134109G)
- Weather-related Operations (134109H)
- Basics of Work Zone Traffic Control (134109I)
- Underground Storage Tanks (134109J)
- Cultural and Historic Preservation (134109K)

Outcomes
Upon completion of the course, participants will be able to:
• Learning outcomes have been established at the module level. Please see the individual modules for the specific learning outcomes.

Target Audience
This course was designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance over broader geographic areas. The target audience is also involved with handling materials, scheduling, budgeting and planning.

Training Level: Basic

Fee: 2022: $50 Per Person; 2023: $0 Per Person

Length: 11 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134109A

Course Title
Maintenance Training Series: Pavement Preservation Program

Pavement preservation represents a major paradigm shift in the way many transportation agencies view and operate their highway networks. The Pavement Preservation Programs course provides basic information on what comprises a pavement preservation program and how it is implemented. It places particular emphasis on changes in practice and assignment of dedicated funding.

Additionally, the training covers the benefits and challenges to a preservation program; Federal and State resources available to support a preservation program; and approaches for communicating the advantages of pavement preservation to stakeholders.

This training was developed as part of the Maintenance Training Series. To access all the courses in the series, enroll in the 134109 course.

Outcomes
Upon completion of the course, participants will be able to:

• Identify the benefits and challenges of implementing a pavement preservation program
• Determine ways to develop support for a pavement preservation program

Target Audience
This course is designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 1 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Maintenance Training Series: Shaping and Shoulders

Shoulders play an important role in both pavement performance and roadway safety. Maintaining shoulders in a proper and timely manner is a primary goal of transportation agencies. In an effort to assist agencies in meeting this goal, the Shaping and Shoulders training provides information on the maintenance of both paved and unpaved shoulders, including specific details on the maintenance of gravel shoulders. This course is primarily intended for inspectors and technicians.

In addition to a discussion of the various types of shoulders, project selection considerations, and key maintenance issues, this training places shoulders and shaping into the context of an overall maintenance and pavement preservation program.

This training was developed as part of the Maintenance Training Series. To access all the trainings in the series, enroll in the 134109 course.

OUTCOMES

Upon completion of the course, participants will be able to:

• Identify desirable characteristics of various types of shoulders
• Identify project selection considerations for shaping and shoulders
• Describe shoulder shaping and blading activities, including equipment requirements and construction activities
• Describe how a shoulder and ditching program forms the core of the overall maintenance and pavement preservation program

TARGET AUDIENCE

This course is designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

TRAINING LEVEL: Basic

FEE: 2022: $25 Per Person; 2023: $0 Per Person

LENGTH: 1.5 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Maintenance Training Series: Thin HMA Overlays and Leveling

Thin HMA overlays and leveling are common pavement treatments and can be a central part of a maintenance crew’s activities. During the Thin HMA Overlays and Leveling training, participants will be introduced to the characteristics and purposes of thin HMA overlays as well as the placement of leveling courses. Each of these techniques is capable of improving the functionality of an otherwise structurally sound pavement.

The training also covers information on the materials, personnel, and equipment needed for thin HMA overlays; items that should be considered when making project selection decisions; and guidance on proper mixture compaction. This information is designed to help participants improve project planning and execution for thin HMA overlays and leveling treatments.

This training was developed as part of the Maintenance Training Series. To access all the courses in the series, enroll in the 134109 course.

OUTCOMES

Upon completion of the course, participants will be able to:

• Determine the purpose of thin HMA overlays and leveling courses
• Identify material components of HMA overlays
• Identify personnel and equipment needed for HMA overlays and leveling construction
• Identify project selection considerations for thin HMA overlays and leveling
• Identify how this treatment can be incorporated into an overall system preservation program

TARGET AUDIENCE

This course is designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

TRAINING LEVEL: Basic

FEE: 2022: $25 Per Person; 2023: $0 Per Person

LENGTH: 1.5 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134109D

Course Title
Maintenance Training Series: Base and Subbase Stabilization and Repair

Before preservation treatments can be applied, localized repairs may be necessary for a pavement's base or subbase. The Base and Subbase Stabilization and Repair course gives participants the knowledge they need to determine if the base or subbase must be stabilized or repaired, to select the appropriate stabilization and repair methods for a given project, and to ensure the repair is performed properly.

This training reviews the failures and distresses that indicate structural deterioration exists in a roadway. The course also covers project selection and trade-off considerations through example roadway projects that give participants the opportunity to evaluate a roadway and determine if it is a candidate for reconstruction or repair. Participants can use this information, as well as guidance on design and construction, to make sound project planning decisions.

This training was developed as part of the Maintenance Training Series. To access all the courses in the series, enroll in the 134109 course.

Outcomes
Upon completion of the course, participants will be able to:

• Identify the symptoms of a localized base or subbase problem, which require greater depth of stabilization and repair than a hot-mix asphalt (HMA) or portland cement concrete (PCC) surface repair patch
• Determine when it is appropriate to employ base or subbase repair on a preventive maintenance project
• Identify the most appropriate repair methods if base or subbase failures are identified in a project

Target Audience
This course is designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 1 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134109E

Course Title
Maintenance Training Series: Roadway Drainage

Shoulder, ditch, and pipe or culvert maintenance activities are performed frequently throughout the year. These activities are critical for avoiding hazardous roadway conditions and extending the life of pavements by controlling water flow along maintainable pathways. This course, Roadway Drainage, provides information on the purpose, function, and components of roadway drainage systems.

This course reviews the components of shoulders and ditches, the purpose of a roadway drainage inventory, and the permits used in roadway drainage maintenance. Examples of existing drainage inventories are provided. In addition, the benefits of proper water removal are discussed through examples of drainage system issues, such as ponding and washouts, in order to emphasize the connection between good drainage and roadway safety.

This training was developed as part of the Maintenance Training Series. To access all the courses in the series, enroll in the 134109 course.

Outcomes
Upon completion of the course, participants will be able to:

• Identify the purpose and function of roadway drainage systems
• Identify eight components of roadway drainage systems
• Identify the purpose of a roadway drainage inventory
• Identify the purpose of permits in roadway drainage maintenance
• Identify the components of shoulders and ditches

Target Audience
This course is designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 1 Hours (CEU: 0 Units)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134109F

Course Title
Maintenance Training Series: Outdoor Advertising and Litter Control

The Highway Beautification Act (HBA) of 1965 mandated a state program, based on Federal rules and regulations, for improving motorists’ visual experiences on the roadway. The HBA affects billboards and advertisements along State roadways. The Outdoor Advertising and Litter Control course familiarizes maintenance personnel with the rules and regulations governing placement and control of outdoor advertising along highway rights-of-way to ensure they are in compliance with the standards stipulated in the HBA. Additionally, the course covers litter control safety for public groups assisting State DOTs in litter pickup.

Participants learn about the rules and regulations for maintaining and controlling outdoor advertising, guidance on administering an outdoor advertising program, the steps involved in the permitting process, and appropriate actions for non-compliance by sign owners. Additionally, participants are encouraged to compare the standards outlined in the HBA to their State’s rules and regulations, which may include stricter provisions than those in the HBA.

This training was developed as part of the Maintenance Training Series. To access all the courses in the series, enroll in the 134109 course.

Outcomes
Upon completion of the course, participants will be able to:

- Identify Federal and State regulations, laws, ordinances, guidelines, and policies governing outdoor advertisement placement
- Describe the permit process
- Describe the role of the maintenance supervisor in outdoor advertising control

Target Audience
This course is designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 0.5 Hours (CEU: 0 Units)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134109G

Course Title
Maintenance Training Series: Roadside Vegetation Management

Vegetation management is much more than routine mowing of grass and trimming of bushes and trees. The Roadside Vegetation Management course explains the need for and purpose of good vegetation management. The course also underscores why vegetation management is a critical part of a roadway maintenance program.

Participants learn about equipment and herbicides used for vegetation management, including an overview of mechanical vegetation control and the environmental controls and precautions needed when using herbicides as part of a noxious weed control program.

This training was developed as part of the Maintenance Training Series. To access all the courses in the series, enroll in the 134109 course.

Outcomes
Upon completion of the course, participants will be able to:
• Describe why vegetation control is important to roadway safety and performance
• Identify the types of equipment used for mechanical vegetation control
• Identify types of herbicide vegetation management methods, their use, environmental control, and precautions
• Describe the requirements of a noxious weed control program

Target Audience
This course is designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

Training Level: Basic
Fee: 2022: $25 Per Person; 2023: $0 Per Person
Length: 1 HOURS (CEU: 0 UNITS)
Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134109H

Course Title
Maintenance Training Series: Weather-related Operations

Storm control is a major component of roadway maintenance in many areas of the country. State, municipal, and county agencies are responsible for providing safe, passable roadways even in severe weather. While the majority of the Weather-related Operations course concentrates on snow and ice storms, many of the elements apply to other weather events as well. Tornadoes, hurricanes, and flooding all require coordination and dedication of maintenance personnel. In any weather event, agencies need to restore roadways and bridges and to ensure they are safe for motorists.

Participants learn about the planning requirements for an effective storm response, including scheduling and training personnel, identifying equipment needs, executing dry runs, and the additional requirements posed by a multi-day storm event. This training assists participants with planning and responding effectively to all weather-related operations.

This training was developed as part of the Maintenance Training Series. To access all the courses in the series, enroll in the 134109 course.

Outcomes
Upon completion of the course, participants will be able to:

• Identify the elements of an effective storm response plan
• Identify factors involved in scheduling personnel needs
• Identify safety and training considerations for maintenance personnel who are involved in weather-related operations
• Identify the types of equipment used in a snow and ice removal plan and their uses
• Describe how to identify equipment needs for a particular storm

Target Audience
This course is designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 1 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov

NHI Training Information: (877) 558-6873 • Fax (703) 235-0577
Course Number
FHWA-NHI-134109I

Course Title
Maintenance Training Series: Basics of Work Zone Traffic Control

Meeting the national requirements for work zone traffic control is a critically important responsibility of maintenance personnel. The national requirements, found in Part 6 of the Manual on Uniform Traffic Control Devices (MUTCD), promote driver and worker safety during roadway maintenance projects. This training, Basics of Work Zone Traffic Control, provides an introduction to the requirements outlined in Part 6 of the 2009 MUTCD. The course also offers an overview of the manual's structure and requirements regarding traffic control devices and their applications, flagging operations and procedures, and pedestrian and worker safety.

Through a series of work zone scenarios, this training uses the MUTCD Part 6 to review fundamental concepts of setting up work zones, including proper signage, taper lengths, and flagging procedures. Participants are encouraged to compare their State's standards, if available, to the guidance established in the MUTCD and determine what additional requirements may need to be met to establish safe, compliant work zones.

This training was developed as part of the Maintenance Training Series. To access all the courses in the series, enroll in the 134109 course.

Outcomes
Upon completion of the course, participants will be able to:

• Describe the content and use of The Manual on Uniform Traffic Control Devices (MUTCD) Part 6
• Use the MUTCD to correctly answer questions about the basics of work zone traffic control
• Differentiate among standard, guidance, and option conditions in the MUTCD
• Differentiate among standard, guidance, and option conditions in the MUTCD for work zone traffic control in rural and urban areas

Target Audience
This course is designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

Training Level: Basic
Fee: 2022: $25 Per Person; 2023: $0 Per Person
Length: 1 HOURS (CEU: 0 UNITS)
Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134109J

Course Title
Maintenance Training Series: Underground Storage Tanks

The Nation's underground storage tank (UST) systems consist of underground tanks and piping that store petroleum and other hazardous materials. This course, Underground Storage Tanks, addresses the procedures to install, operate, and remove USTs.

Developed specifically for maintenance personnel, this course provides participants with an understanding of the Federal laws and regulations that govern UST systems. During the course, participants acquire the knowledge needed to successfully oversee UST installations and closures. Specifically, the course explores the requirements of industry installation and closure codes, leakage detection, spill and overfill prevention, corrosion protection, and ensuring a “clean” closure.

This training was developed as part of the Maintenance Training Series. To access all the trainings in the series, enroll in the 134109 course.

Outcomes
Upon completion of the course, participants will be able to:
• Describe the regulatory framework governing the operation of underground storage tanks
• Describe UST operations
• Describe the process that must be followed to obtain satisfactory “clean closure” from the appropriate oversight agency
• Describe UST cleanup and removal operations

Target Audience
This course is designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person
Length: 1 HOURS (CEU: 0 UNITS)
Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134109K

COURSE TITLE
Maintenance Training Series: Cultural and Historic Preservation

Cultural and historic sites are often located within an area where maintenance activities are scheduled to be completed. This training, Cultural and Historic Preservation, is teaches participants about regulations and concerns related to safeguarding cultural and historic sites from the potential impacts of highway maintenance activities. Examples of maintenance activities that can impact cultural or historic sites include slope stabilization, shoulder or pavement widening, and vegetation control. Additional examples are presented during the course.

This course assists participants with recognizing potential historic or cultural resources, verifying a site’s cultural or historic status, and avoiding impacts to sites when carrying out maintenance activities. Since completing these tasks often requires additional expertise, resources for obtaining needed assistance are provided. In addition, participants learn how maintenance activities can enhance cultural and historic sites through utilization of Context Sensitive Solutions (CSS).

This training was developed as part of the Maintenance Training Series. To access all the courses in the series, enroll in the 134109 course.

OUTCOMES
Upon completion of the course, participants will be able to:
• Identify governing bodies and registries that should be consulted prior to commencing maintenance activities on sites of cultural and historic importance
• Recognize what sorts of structures, landmarks, and properties could pose potential cultural and historic preservation issues
• Describe how to avoid impacts to historic sites
• Describe the role of DOT in maintaining and enhancing cultural resources

TARGET AUDIENCE
This course is designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

TRAINING LEVEL: Basic

FEE: 2022: $25 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134112

Course Title
Principles and Practices for Enhanced Maintenance Management Systems

Is your agency in the process of enhancing its maintenance management capabilities?
Are you interested in learning more about developing effective performance measures for maintenance activities?
If so, join us for a blended training course that features both independent study material and facilitated Web-conferences. You will be introduced to the methods and practices used in an enhanced maintenance management system (MMS) to effectively maintain and operate a highway network. You will explore the principles and practices of using MMS to effectively examine efficient maintenance and operation of a highway network. Throughout the course, you will learn by participating in activities and assignments specific to using MMS.

The course materials rely heavily on the AASHTO Guidelines for Maintenance Management Systems, Transportation Asset Management Guide, and several other recent publications on the topic. To illustrate the application of the principles, the course materials are supplemented with examples from State and local highway agencies.

Participant Responsibilities:
- 7 Web-based lessons (Duration: 1-1.5 hrs each)
- 3 Web-conferences (Duration: 2 hours each)

To obtain your certificate, you must complete all Web-based lessons and Web-conferences. To receive Continuing Education Units (CEUs), you must also pass the online test at the end of the course. You will need your own computer with an Internet connection as well as a telephone line in order to participate.

Outcomes
Upon completion of the course, participants will be able to:
- Compare and contrast a first generation MMS with an enhanced MMS
- Describe the terms “outcome-based” and “performance-based” and how they pertain to an enhanced MMS
- Describe the use of service levels to support the programming and budgeting activities incorporated into an MMS
- Identify the types of systems that should be integrated with an MMS and provide several examples of the types of data that should interface between each system
- List the potential benefits to be realized by fully integrating an enhanced MMS
- Identify several steps that will advance an agency’s current maintenance management practices now and in the future

Target Audience
The target audience for this course includes State and local maintenance engineers, maintenance supervisors, asset managers, and their industry counterparts. The course is specifically for individuals who are responsible for directing and managing maintenance operations and budgets, maintenance project and treatment selection, and/or the monitoring of system conditions.

Training Level: Basic
Fee: 2022: $225 Per Person; 2023: $225 Per Person
Length: 15 HOURS (CEU: 1.5 UNITS)
Class Size: Minimum: 10; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Preparing and Communicating Effective Utility Relocation Requirements

Preparing and practicing effective utility relocation requirements are critical for success in today’s highway projects! Impacts from inefficiencies in the utility coordination process include cost overruns and time delays in transportation projects. Further, the lack of utility information in bid packages increases construction contractor’s risks, which can lead to the possibility of fewer qualified bidders or higher bids. This self-paced, web-based training provides the information you need to understand the purpose and value of utility agreements as well as the requirements for them.

How do you know if this course is right for you? Read on to find out what you will learn and be able to apply to your role.

-If your role includes preparing and communicating utility agreements and their supporting documents, then this course can guide you through which elements to include and how to properly prepare them. Explore effective techniques for relocation plans; utility relocation cost estimates; and utility relocation schedules.

-FHWA division personnel will gain knowledge and tools for understanding utility agreements and construction bid packages and to evaluate the effectiveness of a State utility program.

-STAs and LPAs could significantly improve project delivery and minimize cost and time change orders through the preparation of complete, effective, documentation of utility agreements and utility-related construction bid packages.

OUTCOMES

Upon completion of the course, participants will be able to:

- Differentiate effective supporting documents (utility relocation plans, utility relocation cost estimates, and utility relocation schedules) from ineffective supporting documents in a utility agreement.
- Evaluate the effectiveness of a utility agreement.
- Differentiate effective utility statements from ineffective utility statements.
- Evaluate the effectiveness of utility information in construction bid packages.

TARGET AUDIENCE

-Federal Highway Administration (FHWA) division officials and Federal Land Highway Division officials, including utility leads and area engineers-State transportation agencies (STAs) and local public agencies (LPAs) including utility practitioners (utility coordinators, utility engineers, and utility directors); design project managers and designers; construction engineers and project managers-Highway and utility consultants who handle utility coordination and relocations as part of a project delivery team, including utility coordination consultants, subsurface utility engineering firms, and design and construction consultants-Utility owner officials and their construction contractors.

General, acceptable levels of experience or education include the following: -Some familiarity with utility agreements and what is communicated in project documents-Familiarity with utility accommodation and relocation regulations and practices-Familiarity with the transportation project delivery process-Familiarity with typical project documents such as plans, specifications, special provisions, cost estimates, and project schedules-Additional helpful background:-Working knowledge of reading plans-Familiarity with Subsurface Utility Engineering (SUE)-FHWA-NHI-310110 “Federal-Aid Highways - 101” (State Version) or equivalent knowledge-FHWA-NHI-134006A “Introduction to Utility Coordination for Highway Projects” or equivalent knowledge

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 3.5 HOURS (CEU: .4 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134204

COURSE TITLE
Construction of Mechanically Stabilized Earth (MSE) Walls

This training was developed by the Transportation Curriculum Coordination Council (TCCC) in partnership with AASHTO and NHI.

This training contains a collection of best practices from various agencies, including FHWA training rules, laws, policies, and procedures.

This Web-based training course begins with an overview of MSE walls: why we use them; how they work; and how they are constructed. The course emphasizes the need for inspection and explores practices to help improve inspection techniques. Participants examine the roles of the inspector, engineer, and contractor and study relevant safety procedures. The course materials present considerations for design and information contained in a geotechnical report.

This course also familiarizes participants with typical project drawings and typical specifications.

The course duration is approximately 5 hours. The ten individual modules do not need to be completed at one time.

OUTCOMES
Upon completion of the course, participants will be able to:

• Identify the four major components of a MSE wall
• Describe the basic construction sequence for MSE
• Describe why MSE wall construction inspection is needed
• Describe the appropriate applications of MSE walls
• Describe the advantages and limitations of MSE walls
• Describe the basic design concepts used during construction
• Describe the failure modes analyzed during design
• Describe the key sections of the geotechnical report
• Describe how the geotechnical report can help familiarize the MSE wall inspector with site conditions
• Describe how reviewing the geotechnical report can help mitigate construction problems and delays
• Describe the difference between plan, elevation, and cross-section view drawings
• Describe the differences between, and the details included within, shop and contract drawings
• Identify how each type of drawing illustrates where and how MSE walls, and associated or adjacent parts, are constructed
• Describe construction inspectors’ responsibilities before and during excavation
• Describe foundation preparation techniques necessary for addressing field conditions
• Identify the components of a welded wire faced MSE wall
• Describe the construction steps for a welded wire faced MSE wall
• Describe equipment and procedures necessary to prepare concrete panels for construction of a MSE wall
• Describe the steps in constructing MSE walls with concrete panel facing
• Describe the sections within the specifications document
• Identify the relevant information contained within each specification section

TARGET AUDIENCE
This training is ideal for highway construction teams, specifically the highway workers and inspectors involved in the construction of MSE walls. This training is recommended for the Transportation Curriculum Coordination Council levels II, III, and IV.
**TRAINING LEVEL:** Basic

**FEE:** 2022: $50 Per Person; 2023: $0 Per Person

**LENGTH:** 5 HOURS (CEU: 0 UNITS)

**CLASS SIZE:** MINIMUM: 1; MAXIMUM: 500

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134205

COURSE TITLE
Probabilistic Risk-Based Estimating for Highway Project Cost and Schedule

This course is an interactive eBook that provides you an awareness of concepts and processes utilized to successfully implement probabilistic risk-based estimating (PRBE). Participants will use the eBook as a reference to understand basic terminology and recognize good practices when structuring a project for risk assessment. This interactive eBook allows participants to relate basic concepts and processes to real-world examples, case studies and challenges.

The purpose of this course is to help participants acquire knowledge to improve timely project delivery and limit the costs and delays associated with inaccurate cost and schedule estimation, as well as to help participants realize the potential benefits of a well-constructed, thoroughly reviewed, and properly communicated PRBE estimate.

Participants will understand the need for PRBE, recognize how to conduct a successful PRBE risk workshop to support risk analysis, and use results to enhance project delivery by reducing risks to project cost and schedule objectives.

By acquiring new skills, the participants will improve their ability to manage project cost and schedule.

Examples of these capabilities include:

- Understanding the need for PRBE.
- Using PRBE results to enhance project delivery.
- Properly setting up and structuring a cost estimate for risk analysis.
- Utilize risk assessment to develop reliability estimates of cost and schedule and identify significant project risks.
- Presenting risk workshop results to leadership for improved decision-making.
- Recognizing how to set up a successful risk workshop for input to risk assessment.

After completing the self-paced eBook, participants return to their NHI My Training page to complete the exam and receive a certificate of completion and CEUs.

OUTCOMES

Upon completion of the course, participants will be able to:

- 1.1 Describe the relationship between project management, risk management, and PRBE.
- 1.2 Compare traditional and risk-based estimating.
- 1.3 Describe how PRBE results can be used to effectively manage a project.
- 1.4 Identify key benefits of PRBE to agency leadership and the public.
- 1.5 Explain the benefits of using PRBE results.
- 2.1 Compare traditional estimating to PRBE.
- 2.2 Describe the four basic components of uncertainty.
- 2.3 Define risk, likelihood, and impact.
- 2.4 Describe the difference between dependency and correlation.
- 2.5 Differentiate the approaches to “minor” and “significant” risk.
- 2.6 Describe how uncertainty is expressed through base estimate.
- 2.7 Explain the purpose of the forecast chart.
- 2.8 Describe the types of risks appropriate for the risk register and how they may be assessed.
- 2.9 Describe at least three types of risk response.
- 2.10 Provide an example of criteria used to accept risk.
- 2.11 Describe a method used to prioritize risk.
- 3.1 Describe what is meant by “basis of estimate.”
- 3.2 Define base estimate.
• 3.3 Evaluate a given project delivery schedule and define the different cost phases (design, right-of-way (ROW), and construction) and segments for analysis.
• 3.4 Describe two significant components of base uncertainty.
• 3.5 Compare top-down versus bottom-up base variability.
• 3.6 Differentiate the modeling approach to market conditions and inflation.
• 3.7 Identify three methods of risk identification.
• 3.8 Identify at least four types of bias.
• 3.9 Evaluate PRBE results to enhance project delivery.
• 3.10 Describe how significant risks are represented in risk-based results.
• 3.11 Compare low-probability and high-impact risk versus high-probability and high-impact risk.
• 3.12 List common PRBE outputs.
• 4.1 Describe the elements of an effective risk workshop.
• 4.2 Apply scalability factors for a given workshop scenario.
• 4.3 Explain how PRBE results can be used to treat risk.
• 4.4 Identify key participants in a risk workshop and describe their responsibilities.
• 4.5 Describe how the impact of uncertainty can be assessed by subject matter experts.
• 4.6 Explain what is meant by “conditioning” workshop participants.
• 4.7 Verify risk workshop results.
• 4.8 Identify the components of an effective PRBE presentation

TARGET AUDIENCE
The target audience includes DOTs and FHWA Division Offices. The primary target audience for this eBook includes DOT and FHWA staff, including planners, project managers, and cost-estimate staff, as well as Headquarters’ engineers and region- or district-level engineers. Secondary target audiences may include State subject matter experts in the areas of real estate, environment, construction, and geo-technology. Additionally, large local agencies and consultants working for contractors or the agency as part of the project delivery team could benefit from this eBook.

TRAINING LEVEL: Intermediate

FEE: 2022: $50 Per Person; 2023: $0 Per Person

LENGTH: 10 HOURS (CEU: 1 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134206

COURSE TITLE
Rockfall Stabilization

This training was developed by the Transportation Curriculum Coordination Council (TCCC) in partnership with AASHTO and NHI. This course will introduce the key concepts in rockfall stabilization, including tools and methods used in stabilization and reinforcement. The purpose of this course is to familiarize the construction inspector with current techniques utilized in stabilizing rock slopes with respect to rockfall. This course contains six modules:

Module 1: Introduction
Module 2: Scaling
Module 3: Rock Reinforcement and Drainage
Module 4: Surface Stabilization
Module 5: Rockfall Containment Systems on Slope
Module 6: Rockfall Barriers Along Edge of Road

OUTCOMES
Upon completion of the course, participants will be able to:
- Describe scaling methods and techniques
- Identify and explain reinforcement strategies and the need for drainage
- Describe surface stabilization methods
- Identify and explain different types of rockfall containment systems and barriers
- Identify hand scaling, mechanical scaling, and trim blasting and describe the tools that are used
- Explain typical types of rock reinforcement and how they work
- Explain horizontal drains and grouting
- Explain the types of rock reinforcement testing
- Describe and identify types of surface stabilization
- Describe the application of wet-mix and dry-mix shotcrete
- Identify and explain high tensile strength wire mesh, draped wire mesh, and cable net
- Identify and explain mid-slope attenuator fences and flexible rockfall fences

TARGET AUDIENCE
Federal, State, and local highway agency employees and consultant personnel who are involved in the stabilization of rock slopes, as well as construction inspectors responsible for rockfall stabilization, may benefit from this course.

TRAINING LEVEL: Basic

FEE: 2022: $50 Per Person; 2023: $0 Per Person

LENGTH: 4 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134207A

COURSE TITLE
How to Construct Durable Full-Depth Repairs in Concrete Pavements

Full-depth repairs are used to restore localized areas of slab damage that extend beyond the upper one-third of slab depth or originate from the slab bottom.

This course provides a comprehensive guide for performing full-depth repairs—from planning for, preparing, and evaluating the repair through testing and quality assurance after construction is complete. In the Web-based training you will find detailed, how-to instruction that covers the full scope of tasks involved in successfully completing a full-depth repair project. Instructional methods include short, focused, and task-based lessons, visual aids, and assignments that are directly applicable to work in the field.

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain the purpose of full-depth repairs
• Identify pavement problems that full-depth concrete pavement repairs can and cannot address
• Describe proper project review and material checks for a preservation job involving full-depth repair
• Explain the proper safety and personal protective equipment you will need when performing full-depth repair projects
• Describe the criteria for selecting repair locations and boundaries
• Explain what to do if you think the boundaries are marked incorrectly
• Explain how patching materials are selected for full-depth repair
• Describe the patch material mixing and handling factors that impact the quality of the repair
• Describe the different types of perimeter joint faces for transverse and longitudinal joints
• List important considerations for sawing perimeter joints
• Explain how deteriorated concrete can be removed from the repair area
• List the steps you can take to minimize damage to surrounding pavement when removing concrete
• Describe how to prepare the repair area for new concrete
• Define load transfer
• Describe important considerations for installing dowel bars for full-depth repairs
• List the three ways to connect longitudinal steel for CRCP full-depth repairs
• Explain how to handle the longitudinal joints in longer and shorter patches
• Explain the steps required to place, finish, and cure the concrete for a full-depth repair
• Describe the texturing methods used to match the patch texture with the surrounding pavement
• Explain the steps for sealing the patch perimeter joints
• Explain the difference between quality control and acceptance, including who is responsible
• Describe the tests that may be used for acceptance and opening to traffic

TARGET AUDIENCE
This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. This training is ideal for construction foremen, workers, technicians, agency inspectors, construction managers, and engineers.
**Training Level:** Basic

**Fee:** 2022: $25 Per Person; 2023: $0 Per Person

**Length:** 3 Hours (CEU: 0 Units)

**Class Size:** Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134207B

Course Title
How to Construct Durable Partial-Depth Repairs in Concrete Pavements

This course provides a comprehensive guide for performing partial-depth repairs—from planning for, preparing, and evaluating the patch through testing and quality assurance after construction is complete. Partial-depth repairs are defined as the removal and replacement of small areas of deteriorated (or spalled) concrete pavement. Partial-depth repairs are an alternative to full-depth repairs in areas where slab deterioration is located primarily in the upper one-third to upper one-half of the slab and the existing load transfer devices (if any) are still functional.

This important preservation technique can slow or eliminate the spread of spalling distresses that tend to occur under repeated thermal stresses, freezing and thawing, and traffic loading. The information in this course covers all of the considerations for partial-depth repairs including patch materials and construction techniques to produce patches that are cost-effective and can last 10 to 15 years or longer.

You will discover detailed, how-to instruction that covers the full scope of tasks involved in successfully completing a full-depth repair project. The instructional methods in this Web-based training include short, focused, and task-based lessons, visual aids, and assignments that are directly applicable to work in the field.

Outcomes
Upon completion of the course, participants will be able to:
• Explain what a partial-depth repair is, and why it is used
• Identify the types of distresses that partial-depth repair can and cannot address
• Describe the three types of partial-depth repairs used to replace deteriorated concrete
• Describe proper project review and material checks for a preservation job involving partial-depth repair
• Explain worker safety, health, and personal protective device considerations for partial-depth repair projects
• Describe the criteria for selecting repair locations and boundaries
• Explain what to do if you think the boundaries are marked incorrectly
• Describe the methods for removing deteriorated concrete in preparation for a partial-depth repair
• Identify which methods are appropriate for the different types of partial-depth repairs
• Describe how to prepare the existing slab for repair material
• Identify the materials used in a partial-depth repair
• List the factors that influence repair mixture selection
• Identify when compression relief is necessary for a partial-depth repair project
• Describe how to reestablish a joint or crack by installing joint or crack compression relief material or by sawing
• List the four major steps for properly placing the patching material
• Explain the process for completing the patch
• Explain the difference between quality control and acceptance, including who is responsible
• Describe the tests that may be used for acceptance and opening to traffic

Target Audience
This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. This training is ideal for construction foremen, workers, technicians, agency inspectors, construction managers, and engineers.
Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 2.5 Hours (CEU: 0 Units)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134207C

Course Title
Proper Diamond Grinding Techniques for Pavement Preservation

This course provides how-to instruction covering the scope of tasks and considerations involved in performing diamond grinding, diamond grooving, and next generation concrete surfacing (NGCS) operations.

Diamond grinding and grooving are surface restoration procedures used to correct concrete pavement surface distresses or deficiencies. They are often used in conjunction with other pavement preservation techniques (e.g., dowel bar retrofit, partial-depth repairs, full-depth repairs) as part of a comprehensive pavement preservation program. Each technique addresses a specific pavement shortcoming. In some situations, it may be justified to use diamond grinding or diamond grooving as the sole preservation technique. However, this depends on the conditions and characteristics of the specific project.

You will benefit from short, focused, and task-based lessons and visual aids that reinforce content by showing its relevance to work in the field.

Outcomes
Upon completion of the course, participants will be able to:
• Explain what diamond grinding is, and why it is used
• Explain how diamond grinding equipment works
• Describe the steps to take to prepare for diamond grinding on a project
• List the components of the cutting head
• Describe how blade selection impacts grinding success
• Explain basic procedures for safely operating diamond grinding equipment
• Determine when specialized equipment may be necessary
• Explain how to measure head wear
• Define slurry
• Describe how slurry is picked up and disposed of during diamond grinding operations
• Name the diamond grinding machine’s systems and their components
• Identify the system to which each part of the diamond grinding machine belongs
• Describe the function of each part or system on a diamond grinding machine
• Describe how diamond grinding is used to affect road smoothness, noise, and friction
• Explain what Next Generation Concrete Surfacing (NGCS) is, and when it is used
• List considerations for grinding on city streets
• Identify quality issues that can occur during diamond grinding
• Explain how diamond grinding quality issues can be prevented or addressed
• Identify issues that cannot be controlled by the contractor and require owner consideration and input
• Describe the equipment used in diamond grooving operations
• Explain how the diamond grooving texture is achieved

Target Audience
This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. This training is ideal for construction foremen, workers, technicians, agency inspectors, construction managers, and engineers.
Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 2 Hours (CEU: 0 Units)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134207D

COURSE TITLE
Proper Construction Techniques for Dowel Bar Retrofit (DBR) and Cross-Stitching

This course provides how-to instruction that covers the scope of tasks and considerations involved in performing dowel bar retrofit and cross-stitching operations.

DBR is the installation of dowel bars at existing transverse joints or cracks in order to effectively transfer wheel loads across slabs and reduce deflections. Dowel bars are retrofitted into the joints of existing concrete pavements, which either do not have load transfer devices, or in which the existing devices are no longer functional.

Cross-stitching is a preservation method designed for longitudinal joints or cracks that are in relatively good condition, but that need to be tied stronger together.

This course contains short, focused lessons that are task-based, and contain detailed visual aids and videos, reinforcing content so that it can be directly applied to work in the field.

OUTCOMES
Upon completion of the course, participants will be able to:

- Explain what dowel bar retrofitting and cross-stitching are, and why they are used
- Define load transfer
- Describe the steps you should take to prepare for a project involving DBR or cross-stitching
- Explain the basic components of DBR and cross-stitching projects
- Describe how to determine the size of the components for both DBR and cross-stitching
- Determine the proper locations to use DBR and cross-stitching for different pavement distresses
- Identify the materials used in DBR and cross-stitching operations
- List the important factors in selecting materials for DBR and cross-stitching
- Explain how slots are created and prepared for a DBR project
- Describe how dowel bars should be placed in the slot
- Explain how the backfill material is placed and finished
- Explain how to drill and clean holes for cross-stitching
- Describe the process for installing tie bars
- Explain the procedures for finishing the cross-stitching project
- Describe aspects of DBR and cross-stitching projects that are tested or inspected for quality or acceptance
- List important quality considerations for DBR and cross-stitching projects

TARGET AUDIENCE
This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. This training is ideal for construction foremen, workers, technicians, agency inspectors, construction managers, and engineers.

TRAINING LEVEL: Basic

FEE: 2022: $25 Per Person; 2023: $0 Per Person

LENGTH: 2 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov

Web site: www.nhi.fhwa.dot.gov • E-mail: nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134207E

Course Title
Proper Joint Sealing Techniques for Pavement Preservation

In this course you will find detailed, “how-to” instruction that covers the scope of tasks and considerations involved in performing joint sealing or resealing pavement joints and cracks. Short, focused lessons are task-based in nature and contain detailed visual aids and videos that reinforce content so you can apply new knowledge directly to your work in the field.

Sawed joints are sealed to prevent the intrusion of water, deicing chemicals, and incompressible materials into the pavement structure which can reduce the pavement’s acceptable performance life. Joint sealing is shown to prevent several types of distresses, including joint associated distress, weakening of the base and subgrade supporting structure, blow ups, and voids beneath the joints and subsequent pavement faulting or pumping. It has also been shown recently that when wide joints are used, sealing joints can reduce the overall tire-pavement interaction noise.

Take this course to learn how to employ successful practices and techniques. Specifically, you will learn the answers to these questions:

1. Why is the technique an important part of concrete pavement preservation?
2. What options are available and which options provide the best opportunities for success?
3. What materials are involved in the techniques?
4. What are the specific, sequential tasks required to properly perform joint sealing?

Outcomes
Upon completion of the course, participants will be able to:

• Describe what joint sealing is
• Explain why joints are sealed
• List considerations for preparing for and keeping safe on a joint sealing project
• Describe the materials used in a joint or crack sealing project and their differences
• Describe the standard details used for joint or crack sealing installations
• Identify equipment used for sawing and sealing or resealing joints and cracks
• Describe the purpose of each piece of equipment and how it works
• Explain how a joint or crack is prepared for sealing
• Describe the process for installing the backer rod (if it is used)
• Explain how the sealant or seal is installed
• Describe procedures for applying a penetrating concrete sealer
• Describe procedures for repairing hairline, minor random, and wide cracks
• List important quality considerations for joint sealing projects
• Describe quality control methods you can use to make sure a sealant reservoir is ready for sealant installation and the sealant is installed properly
• Describe how sealant installations are inspected for quality assurance and acceptance
• Identify the distresses or problems that occur with joint sealants and seals
• Explain the steps to take during formed-in-place sealant or compression seal installation

Target Audience
This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. Participants may have some awareness and past involvement with paving processes, but the training is appropriate for learners regardless of experience level with the techniques. The primary audience is contractors. This course will appeal to individuals in the following roles: construction supervisors, workers, and
technicians; agency inspectors and construction managers; and engineers.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $25 Per Person; 2023: $0 Per Person

**LENGTH:** 4 HOURS (CEU: 0 UNITS)

**CLASS SIZE:** MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134207F

Course Title
How to Construct Durable Full-Depth Repairs in Concrete Pavements (Spanish)

This course is in Spanish.

Full-depth repairs are used to restore localized areas of slab damage that extend beyond the upper one-third of slab depth or originate from the slab bottom.

This course, presented in Spanish, provides a comprehensive guide for performing full-depth repairs—from planning for, preparing, and evaluating the repair through testing and quality assurance after construction is complete. In the Web-based training you will find detailed, how-to instruction that covers the full scope of tasks involved in successfully completing a full-depth repair project. Instructional methods include short, focused, and task-based lessons, visual aids, and assignments that are directly applicable to work in the field.

Outcomes
Upon completion of the course, participants will be able to:

• Explain the purpose of full-depth repairs
• Identify pavement problems that full-depth concrete pavement repairs can and cannot address
• Describe proper project review and material checks for a preservation job involving full-depth repair
• Explain the proper safety and personal protective equipment you will need when performing full-depth repair projects
• Describe the criteria for selecting repair locations and boundaries
• Explain what to do if you think the boundaries are marked incorrectly
• Explain how patching materials are selected for full-depth repair
• Describe the patch material mixing and handling factors that impact the quality of the repair
• Describe the different types of perimeter joint faces for transverse and longitudinal joints
• List important considerations for sawing perimeter joints
• Explain how deteriorated concrete can be removed from the repair area
• List the steps you can take to minimize damage to surrounding pavement when removing concrete
• Describe how to prepare the repair area for new concrete
• Define load transfer
• Describe important considerations for installing dowel bars for full-depth repairs
• List the three ways to connect longitudinal steel for CRCP full-depth repairs
• Explain how to handle the longitudinal joints in longer and shorter patches
• Explain the steps required to place, finish, and cure the concrete for a full-depth repair
• Describe the texturing methods used to match the patch texture with the surrounding pavement
• Explain the steps for sealing the patch perimeter joints
• Explain the difference between quality control and acceptance including who is responsible
• Describe the tests that may be used for acceptance and opening to traffic

Target Audience
This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. This training is ideal for construction foreman, workers, and technicians; agency inspectors and construction managers; and engineers.
TRAINING LEVEL: Basic
FEE: 2022: $0 Per Person; 2023: $0 Per Person
LENGTH: 3 HOURS (CEU: 0 UNITS)
CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134207G

Course Title
How to Construct Durable Partial-Depth Repairs in Concrete Pavements (Spanish)

This course is in Spanish.

In this course, presented in Spanish, you will find a comprehensive guide for performing partial-depth repairs from planning, preparing, and evaluating the patch through testing and quality assurance after construction is complete.

Partial-depth repairs are defined as the removal and replacement of small areas of deteriorated, or spalled, concrete pavement. Partial-depth repairs are an alternative to full-depth repairs in areas where slab deterioration is located primarily in the upper one-third to upper one-half of the slab and the existing load transfer devices (if any) are still functional. The technique is an important preservation technique to slow or eliminate the spread of spalling distresses that tend to occur under repeated thermal stresses, freezing and thawing, and traffic loading. The information in this course will cover all of the considerations, including patch materials and construction techniques to produce patches that are cost-effective and can last 10 to 15 years or longer.

Specifically, you’ll learn how to employ successful practices and techniques on concrete pavement preservation projects. The following questions are answered in this course:

- Why is the technique an important part of concrete pavement preservation?
- What options are available for performing the construction processes and procedures?
- Which options provide the best opportunities for success?
- What materials are involved in the techniques?
- What are the proper techniques for mixing, placing, and curing?
- What are the specific, sequential tasks required to properly perform each of the techniques?

Outcomes
Upon completion of the course, participants will be able to:

- Explain what a partial-depth repair is and why it is used
- Identify the types of distresses that partial-depth repair can and cannot address
- Describe the three types of partial-depth repairs used to replace deteriorated concrete
- Describe proper project review and material checks for a preservation job involving partial-depth repair
- Explain worker safety, health, and personal protective device considerations for partial-depth repair projects
- Describe the criteria for selecting repair locations and boundaries
- Explain what to do if you think the boundaries are marked incorrectly
- Describe the methods for removing deteriorated concrete in preparation for a partial-depth repair
- Identify which methods are appropriate for the different types of partial-depth repairs
- Describe how to prepare the existing slab for repairs
- Identify the materials used in a partial-depth repair
- List the factors that influence repair mixture selection
- Identify when compression relief is necessary for a partial-depth repair project
- Describe how to reestablish a joint or crack by installing joint or crack compression relief material or by sawing
- List the four major steps for properly placing the patching material
- Explain the process for completing the patch
- Explain the difference between quality control and acceptance, including who is responsible
- Describe the tests that may be used for acceptance and opening to traffic

Target Audience
This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. This training is ideal for construction foreman, workers, and technicians; agency inspectors and construction managers; and engineers.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $25 Per Person; 2023: $0 Per Person

**LENGTH:** 3 HOURS (CEU: 0 UNITS)

**CLASS SIZE:** MINIMUM: 0; MAXIMUM: 0

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134207H

Course Title
Proper Diamond Grinding Techniques for Pavement Preservation (Spanish)

This course is in Spanish.

In this course, presented in Spanish, you will find “how-to” instruction covering the scope of tasks and considerations involved in performing diamond grinding, diamond grooving, and next generation concrete surfacing (NGCS) operations.

Diamond grinding and grooving are surface restoration procedures used to correct concrete pavement surface distresses or deficiencies. They are often used in conjunction with other pavement preservation techniques (e.g., dowel bar retrofit, partial-depth repairs, full-depth repairs) as part of a comprehensive pavement preservation program. Each technique addresses a specific pavement shortcoming. In some situations, it may be justified to use diamond grinding or diamond grooving as the sole preservation technique; however, this depends on the conditions and characteristics of the specific project.

This course contains short, focused, task-based lessons that include detailed visual aids and videos, which reinforce the content so you can apply new knowledge directly to your work in the field.

Learn how to employ successful practices and techniques on concrete pavement preservation projects. Specifically, you will explore these questions:

Why is the technique an important part of concrete pavement preservation?
What options are available for performing the construction processes and procedures?
Which options provide the best opportunities for success?
What materials are involved in the techniques?
What are the proper techniques for mixing, placing, and curing?
What are the specific, sequential tasks required to properly perform each of the techniques?

Outcomes
Upon completion of the course, participants will be able to:

• Explain what diamond grinding is and why it is used
• Explain how diamond grinding equipment works
• Describe the steps to take to prepare for diamond grinding on a project
• List the components of the cutting head
• Describe how blade selection impacts grinding success
• Explain basic procedures for safely operating diamond grinding equipment
• Determine when specialized equipment may be necessary
• Explain how to measure head wear
• Define slurry
• Describe how slurry is picked up and disposed of during diamond grinding operations
• Name the diamond grinding machine’s systems and their components
• Identify the system to which each part of the diamond grinding machine belongs
• Describe the function of each part or system on a diamond grinding machine
• Describe how diamond grinding is used to affect road smoothness, noise, and friction
• Explain what Next Generation Concrete Surfacing (NGCS) is and when it is used;
• List considerations for grinding on city streets
• Identify quality issues that can occur during diamond grinding
• Explain how diamond grinding quality issues can be prevented or addressed
• Identify issues that cannot be controlled by the contractor and require owner consideration and input
• Describe the equipment used in diamond grooving operations
• Explain how the diamond grooving texture is achieved

TARGET AUDIENCE
This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. This training is ideal for construction foreman, workers, and technicians; agency inspectors and construction managers; and engineers.

TRAINING LEVEL: Basic

FEE: 2022: $25 Per Person; 2023: $0 Per Person

LENGTH: 3 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134207I

Course Title
Proper Construction Techniques for Dowel Bar Retrofit (DBR) and Cross-Stitching (Spanish)

This course is in Spanish.

This course provides “how-to” instruction in Spanish that covers the scope of tasks and considerations involved in performing dowel bar retrofit and cross-stitching operations.

DBR is the installation of dowel bars at existing transverse joints or cracks to effectively transfer wheel loads across slabs and reduce deflections. Dowel bars are retrofitted into the joints of existing concrete pavements, which either do not have load transfer devices or in which the existing devices are no longer functional.

Cross-stitching is a preservation method designed for longitudinal joints or cracks that are in relatively good condition, but that need to be tied stronger together.

This course contains short, focused lessons that include detailed instructions along with visual aids and videos that reinforce the content so you can apply it directly to your work in the field. Take this course to find answers to these questions:

- Why is the technique an important part of concrete pavement preservation?
- What options are available for performing the construction processes and procedures?
- Which options provide the best opportunities for success?
- What materials are involved in the techniques?
- What are the proper techniques for mixing, placing, and curing?
- What are the specific, sequential tasks required to properly perform each of the techniques?

Outcomes
Upon completion of the course, participants will be able to:

- Explain what dowel bar retrofitting and cross-stitching are, and why they are used
- Define load transfer
- Describe the steps you should take to prepare for a project involving DBR or cross-stitching
- Explain the basic components of DBR and cross-stitching projects
- Describe how to determine the size of the components for both DBR and cross-stitching
- Determine the proper locations to use DBR and cross-stitching for different pavement distresses
- Identify the materials used in DBR and cross-stitching operations
- List the important factors in selecting materials for DBR and cross-stitching
- Explain how slots are created and prepared for a DBR project
- Describe how dowel bars should be placed in the slot
- Explain how the backfill material is placed and finished
- Explain how to drill and clean holes for cross-stitching
- Describe the process for installing tie bars
- Explain the procedures for finishing the cross-stitching project
- Describe aspects of DBR and cross-stitching projects that are tested or inspected for quality or acceptance
- List important quality considerations for DBR and cross-stitching projects

Target Audience
This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. This training is ideal for construction foreman, workers, and technicians; agency inspectors and
construction managers; and engineers.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $0 Per Person; 2023: $0 Per Person

**LENGTH:** 3 HOURS (CEU: 0 UNITS)

**CLASS SIZE:** MINIMUM: 0; MAXIMUM: 0

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134207J

COURSE TITLE
Proper Joint Sealing Techniques for Pavement Preservation (Spanish)
This course is in Spanish.
In this course you will find detailed, “how-to” instruction in Spanish that covers the scope of tasks and considerations involved in performing joint sealing or resealing pavement joints and cracks. Short, focused lessons contain detailed visual aids and videos that reinforce content so you can apply new knowledge directly to your work in the field.
Sawed joints are sealed to prevent the intrusion of water, deicing chemicals, and incompressible materials into the pavement structure which can reduce the pavement’s acceptable performance life. Joint sealing is shown to prevent several types of distresses, including joint associated distress, weakening of the base and subgrade supporting structure, blow ups, and voids beneath the joints and subsequent pavement faulting or pumping. It has also been shown recently that when wide joints are used, sealing joints can reduce the overall tire-pavement interaction noise.
Take this course to learn how to employ successful practices and techniques. Specifically, you will learn the answers to these questions:
Why is the technique an important part of concrete pavement preservation?
What options are available and which options provide the best opportunities for success?
What materials are involved in the techniques?
What are the specific, sequential tasks required to properly perform joint sealing?

OUTCOMES
Upon completion of the course, participants will be able to:
• Explain what joint or crack sealing is, and when it should be performed;
• List important safety considerations when working on joint sealing projects;
• Explain how to prepare for joint sealing;
• Describe recommended materials and equipment used in joint sealing;
• Describe recommended construction procedures and process steps for joint sealing;
• Describe recommend procedures for repairing cracks;
• List the criteria for determining whether joint sealing results are of sufficient quality; and
• Identify typical problems encountered and how to avoid or resolve these issues.

TARGET AUDIENCE
This course provides support and instruction for individuals involved in construction projects using concrete pavement preservation techniques. This training is ideal for construction foreman, workers, and technicians; agency inspectors and construction managers; and engineers.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 3 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134208

COURSE TITLE
Utility Investigations

Unknown utility conflicts on a highway project result in increased risks to highway contractors, which translate into higher bids as well as potential cost increases and delays during construction. Challenges such as inadequate utility information and poor management of utility conflicts can affect project success through construction site disruptions, damage to utility installations, risks to public health and safety, unnecessary utility relocations, project delays, and higher project costs. This course provides an overview of methods and practices for conducting utility investigations during project delivery. Collecting accurate, complete information about existing utilities reduces risk during all phases of project delivery, from planning to construction.

Throughout this course, “utility investigation” is presented as a comprehensive process to identify and document existing utility facilities.

OUTCOMES
Upon completion of the course, participants will be able to:
• Identify the purpose of conducting utility investigations.
• Relate utility investigation activities to project delivery phases.
• Compare various utility investigation methods.
• Apply a risk-based approach to utility investigations.
• Identify typical utility investigation deliverables.

TARGET AUDIENCE
The primary audience includes those responsible for managing pre-construction utility coordination and design for highway projects. Typical participants may include utility managers and highway designers from FHWA Divisions, State DOTs, LPAs, and utility companies. Also benefitting from this course are FHWA, State, and local agency decision-makers, designers, and construction personnel; highway contractors; surveyors; and information technology (IT) staff.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 3.5 HOURS (CEU: .3 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Utility Conflict Management

Utility issues are widely recognized as one of the top reasons for project delays. Utility conflict management (UCM) involves systematically identifying and resolving utility conflicts as part of the transportation project delivery process. Conflicts are frequently the result of inaccurate, incomplete information about existing utilities, ineffective coordination between a State transportation agency (STA) and a utility company, or a lack of understanding of each other’s processes. This course covers the importance of conducting effective UCM and integrating UCM throughout the project development process.

This WBT aims to facilitate the implementation of practices to minimize project risk and improve project delivery reliability by identifying and resolving utility conflicts resulting in improved design plans and fewer unnecessary utility relocations. The course emphasizes the importance of integrating utility investigations into the identification and resolution of utility conflicts and utilizing Utility Conflict Management (UCM) outputs to facilitate utility relocations and other utility process activities throughout project delivery. The judicious application of avoiding, minimizing, and mitigating principles and techniques is also emphasized.

OUTCOMES

Upon completion of the course, participants will be able to:

• Identify the need for conducting effective UCM
• Determine how UCM activities apply throughout project delivery
• Determine how to apply effective UCM strategies and activities
• Compare UCM implementations
• Identify how UCM outputs are incorporated into contract documents

TARGET AUDIENCE

The primary target audience includes those responsible for managing pre-construction utility coordination and design for highway projects. Typical participants may include utility managers and highway designers from FHWA Divisions, STAs, local public agencies (LPAs), consultants, and utility companies. Also benefitting from these courses are FHWA, State, and local agency decision-makers, designers, and construction personnel; highway contractors; surveyors; and information technology (IT) staff.

TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person
LENGTH: 3 HOURS (CEU: .3 UNITS)
CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-138008

Course Title
Transportation Performance Management (TPM) for Bridges

Starting in 2019, this course will be delivered for free to Metropolitan Planning Organizations and State DOTs. The reduced price is being provided by the FHWA Office of Infrastructure. YOU CAN PREVIEW A SUMMARY OF THIS COURSE BY COPYING AND PASTING THE FOLLOWING URL: https://connectdot.connectsolutions.com/nhi138008executivesummary/

‘Transportation Performance Management for Bridges’ is a one-day Instructor-led Training course offered by NHI, the authoritative source in transportation training.

Moving Ahead for Progress in the 21st Century Act (MAP-21) established, and Fixing America’s Surface Transportation (FAST) continued, new requirements for reporting on national performance measures and making progress toward targets in several national goal areas, including the condition of the bridges on the National Highway System (NHS). This course helps agencies apply Transportation Performance Management (TPM) concepts to implement the bridge-related TPM requirements.

The course begins with an overview of key performance management concepts. It then reviews performance measures defined for assessing and reporting bridge performance. Finally, the course details how to set and report bridge performance targets and assess performance against agency targets.

The main goals of the course are to provide agency staff with the skills and abilities to use the national bridge performance management measures to assess bridge condition, establish bridge performance targets, report bridge performance, and assess progress toward achieving bridge performance targets in compliance with the TPM requirements in 23 CFR 490.

The course is organized in the following lessons:
+ TPM Overview
+ Bridge Performance Management and Related Rules
+ Bridge Performance Data
+ Setting Bridge Performance Targets
+ Reporting, Accountability, and Transparency

The course includes a written assessment. The course was launched in May 2018.

YOU CAN PREVIEW A SUMMARY OF THIS COURSE BY COPYING AND PASTING THE FOLLOWING URL: https://connectdot.connectsolutions.com/nhi138008executivesummary/

To enroll in this Instructor-led Training course, select the ‘View Sessions’ button and select ‘Add To Cart’ next to your session choice. If there are no upcoming sessions, select ‘Sign Up for Session Alerts.’

Any organization can host this course. To host this course and bring training to your organization, click the ‘Host this Course’ button.

Outcomes
Upon completion of the course, participants will be able to:
• Describe the transportation performance management (TPM) requirements related to bridge performance
• Describe the performance-based planning and programming process and asset management process as they apply to bridges
• Identify required bridge performance measures, as well as other common bridge performance measures
• Use and interpret bridge performance data
• Identify key supporting business practices for establishing and assessing progress toward achieving targets
• Establish bridge performance targets using data on existing performance and predicted future funds, deterioration, and investment strategies
• Explain common challenges in establishing bridge performance targets and approaches that can be used to address them
• Describe required process for bridge performance measurement, reporting, and assessment
TARGET AUDIENCE
The target audience for this Instructor-led Training course consists primarily of professionals responsible for collecting, analyzing, and reporting bridge performance data; managing bridge inventories; recommending bridge investment strategies; and setting bridge performance targets. This audience includes bridge managers, asset managers, planners, performance management, and programming staff of State and local agencies, consultants, and FHWA.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 DAYS (CEU: .6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142045

Course Title
Pedestrian Facility Design

To emphasize the importance of planning for pedestrians, the course focuses on case examples involving corridor and intersection design issues. Participants are engaged through lecture, discussion, video demonstrations of problem areas in corridors and intersections, small group problem identification, and the development of design alternatives. This training was developed to provide information and application opportunities to those involved in the design of pedestrian facilities. The Americans with Disabilities Act (ADA) requires newly constructed and altered sidewalks to be accessible and usable by people with disabilities, and accessibility improvements need to be implemented for existing facilities.

Outcomes
Upon completion of the course, participants will be able to:

• List the characteristics of pedestrians and motorized traffic that influence pedestrian facility design
• Apply the concepts of universal design and applicable design reference material to redesigning an existing location and/or designing a new location that meets the needs of motorized and nonmotorized users
• Given a case example, identify potential conflicts between pedestrians and other traffic and propose design options that improve access and safety
• Given a case example, analyze the network for improvement options to meet the needs of pedestrian and other traffic

Target Audience
Engineers with planning, design, construction, or maintenance responsibilities; pedestrian and bicycle specialists, disability and orientation specialists, transportation planners, architects, landscape architects, as well as decisionmakers at the project planning level.

Training Level: Intermediate

Fee: 2022: $350 Per Person; 2023: $500 Per Person

Length: 1.5 DAYS (CEU: .9 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-231033V

COURSE TITLE
Public-Private Partnerships (Virtual Delivery of 231033)

COURSE RUNS FROM 1/2 DAY TO 3 DAYS DEPENDING UPON MODULES CHOSEN BY THE HOST. This course is available for all levels of learners: from basic to advanced knowledge in the subject area. The modular approach allows participants to benefit from a customized learning experience. Hosts may choose the basic course, the basic plus some intermediate or advanced lessons, or only more advanced topics--the choice is made to meet the needs of each agency with its own unique requirements! NOTE: The host must provide the classroom with computers, especially if an evaluation case study using P3-VALUE 2.0 is included in the host's selection of modules. Please contact NHI for further information. NOTE: Minimum for basic or intermediate training is 20 participants; minimum for advanced training is 5 participants. Potential hosts should discuss maximum participation numbers with the instructor.

The FHWA Center for Innovative Finance Support has developed a series of training modules to provide information and tools that help participants improve their understanding of how to evaluate potential P3 proposals.

An FHWA-sponsored instructor will present in-person training at your site. The training is tailored to address the needs of each requesting agency. The agenda and training modules presented will be determined through a discussion with FHWA staff and an evaluation of needs. Depending upon the options selected, the training duration runs from 1/2 day to 3 full instructional days. The intent is to fit the training content and schedule to best meet the needs of an individual agency.

Available modules include:

INTRODUCTORY WORKSHOP
Module 1            Overview of P3s
Module 2            Successful P3 Practices

INTERMEDIATE WORKSHOP
Module 3            P3 Risk Allocation
Module 4            P3 Project Financing
Module 5            P3 Evaluation Overview
Module 6            P3 Model Contracts
Module 7            Key P3 Procurement Steps
Module 8            Tolling and Pricing

ADVANCED WORKSHOP
Module 9A          Financial Viability Assessment
Module 9B          Financial Viability Computer Exercise
Module 10A         P3 Value for Money Analysis
Module 10B         P3 Value for Money Computer Exercise
Module 11A         P3 Benefit-Cost Assessment
Module 11B         P3 Benefit-Cost Assessment Exercise
Module 12          Comprehensive Exercise using your project

The training is a mix of presentations, class discussions, and hands-on computer training using the P3-VALUE 2.0 tool, an Excel-based set of spreadsheets that provide a better way to understand the development and evaluation of P3 bids from the public and private sector perspectives.

OUTCOMES

Upon completion of the course, participants will be able to:

• better understand P3s and how to evaluate potential P3 proposals.
• explain the process for developing, procuring and implementing P3s.
TARGET AUDIENCE
State, regional, and local transportation officials may host this course for invited attendees.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: N/A

LENGTH: 8 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 5; MAXIMUM: 40

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-380005

COURSE TITLE
Railroad-Highway Grade Crossing Improvement Program

The training provides information on rail-highway crossings, grade crossing components, including program/project development and administration. Workshops will provide the participants a chance to make hands-on applications of the training material, which include such topics as historical background, railroad-highway intersection definition and components, collection and maintenance of data, assessment of crossing safety and operations, identification and selection of alternate improvements, program and project development and implementation, maintenance, and other topics (i.e., private crossings, operation lifesaver).

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe Active and Passive Devices used in connection with at-grade crossings
• Identify techniques and engineering principles used for at-grade crossings
• Appraise existing at-grade crossings
• Develop alternate methods to improve railroad-highway grade crossings

TARGET AUDIENCE
Federal, State, and local transportation agencies responsible for the design, construction, and/or maintenance of railroad-highway crossings. State and local traffic engineers responsible for highway-railroad grade crossing safety.

TRAINING LEVEL: Accomplished

FEES: 2022: $500 Per Person; 2023: $550 Per Person

LENGTH: 2 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NH1 Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Maintenance of Drainage Features for Safety - WEB-BASED

The purpose of this training is to highlight common roadway drainage problems that can cause an unsafe condition and suggest inspection methods and corrective action. Maintaining roadway drainage is important for safety and for ensuring the long life of the roadway by preventing erosion of the roadway, saturation of the subbase, and damage to roadway structures. The training is broken into two modules:

Module 1: Effects of Drainage describes common roadway safety hazards and how to recognize drainage problems.

Module 2: Safe Drainage Features and Work Zones covers solutions to common roadway safety issues and work zone safety.

This training is not intended to be a design guide. Participants may want to contact their State Local Technical Assistance Program (LTAP) for more details on drainage design.

OUTCOMES

Upon completion of the course, participants will be able to:

- Identify problems created by ponding and standing water on the roadway
- Describe safety issues related to ditches and side slopes
- Describe how drainage features can become safety hazards
- Identify methods for identifying drainage problems
- Recall conditions to look for during field inspections
- Explain how to fix or prevent common roadway side slope problems
- Describe work zone safety procedures

TARGET AUDIENCE

This training is intended to help local road agency maintenance workers understand the importance of maintaining and upgrading drainage features on their road system to avoid an unsafe condition.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135027

COURSE TITLE
Urban Drainage Design (3-Day)

Please Note: NHI offers a virtual alternative to the ILT Course 135027. To register for the virtual option, search the Course Number “135027V”.

This course provides a detailed introduction to urban roadway drainage design. Design guidance for solving basic problems encountered in urban roadway drainage design is provided. The topics are hydrology including rational equation, soil conservation method, regression equations, and synthetic hydrographs; and highway drainage including gutter flow, roadway inlet interception, storm drain systems, energy and hydraulic grade lines, detention ponds, and stormwater management.

This is a 3-day course.

Optional: You may request an additional 1-day FHWA-NHI 135028 Stormwater Pump Station Design course, which will make it a 4-day training in total.

OUTCOMES
Upon completion of the course, participants will be able to:
• Determine runoff (peak flows and volumes) from urban watersheds
• Apply basic hydraulic principles to urban drainage design
• Perform roadway drainage designs using various roadway inlets
• Size and/or analyze storm drain conveyance systems
• Establish the energy and hydraulic grade lines for storm drains
• Design and/or analyze detention basins
• Perform hydraulic design of pumping stations (with optional day four)

TARGET AUDIENCE
Highway designers with limited experience in drainage design, but familiar with mathematical concepts such as algebra and geometry and have some working background in hydrology and hydraulics.

TRAINING LEVEL: Intermediate

FEE: 2022: $850 Per Person; 2023: $850 Per Person

LENGTH: 3 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135027A

COURSE TITLE
Urban Drainage Design (4-Day)

This course provides a detailed introduction to urban roadway drainage design. Design guidance for solving basic problems encountered in urban roadway drainage design is provided. The topics are hydrology including rational equation, soil conservation method, regression equations, and synthetic hydrographs; and highway drainage including gutter flow, roadway inlet interception, storm drain systems, energy and hydraulic grade lines, detention ponds, and stormwater management.

The 4-day course includes the basic 3-day course, plus presentation of the 1-day course FHWA-NHI-135028 Stormwater Pump Station Design.

OUTCOMES
Upon completion of the course, participants will be able to:
• Determine runoff (peak flows and volumes) from urban watersheds
• Apply basic hydraulic principles to urban drainage design
• Perform roadway drainage designs using various roadway inlets
• Size and/or analyze storm drain conveyance systems
• Establish the energy and hydraulic grade lines for storm drains
• Design and/or analyze detention basins
• Perform hydraulic design of pumping stations (with optional day four)

TARGET AUDIENCE
Highway designers with limited experience in drainage design, but familiar with mathematical concepts such as algebra and geometry and have some working background in hydrology and hydraulics.

TRAINING LEVEL: Intermediate

FEE: 2022: $1025 Per Person; 2023: $1025 Per Person

LENGTH: 4 DAYS (CEU: 2.4 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135027V

COURSE TITLE
Urban Drainage Design (Virtual Delivery)

This online course provides a detailed introduction to urban roadway drainage design. Design guidance for solving basic problems encountered in urban roadway drainage design is provided. The topics are hydrology including rational equation, soil conservation method, regression equations, and synthetic hydrographs; and highway drainage including gutter flow, roadway inlet interception, storm drain systems, energy and hydraulic grade lines, detention ponds, and stormwater management.
This is a 4-day online course.

OUTCOMES
Upon completion of the course, participants will be able to:
• Determine runoff (peak flows and volumes) from urban watersheds
• Apply basic hydraulic principles to urban drainage design
• Perform roadway drainage designs using various roadway inlets
• Size and/or analyze storm drain conveyance systems
• Establish the energy and hydraulic grade lines for storm drains
• Design and/or analyze detention basins
• Perform hydraulic design of pumping stations (with optional day four)

TARGET AUDIENCE
Highway designers with limited experience in drainage design, but familiar with mathematical concepts such as algebra and geometry and have some working background in hydrology and hydraulics.

TRAINING LEVEL: Intermediate

FEE: 2022: $850 Per Person; 2023: $850 Per Person

LENGTH: 18 HOURS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
One-Dimensional Modeling of River Encroachments with HEC-RAS

The host is responsible for providing a minimum of one computer for each pair of participants. The computers shall have the following minimum specifications:

Intel Based Pentium processor higher (Pentium III or higher is recommended), Microsoft Windows 95, 98, ME with 212 MB of RAM (1 GB recommended) or Window NT 4.0, 2000, Vista, XP, 7, or 8 with 1 GB of RAM (1 GB recommended), including the .NET framework, a hard drive with at least 60 megabytes of free space (100 MB or more is recommended), CD-ROM drive, and 1024 x 768 color video display.

The course focuses on the use and application of HEC-RAS software, developed by the Hydrologic Engineering Center of the U.S. Army Corps of Engineers. Modeling principles and techniques will be presented using the latest version of HEC-RAS.

HEC-RAS, River Analysis System, solves the conservation of energy equation for one-dimensional steady flow analysis to determine water surface elevations for a given discharge. The Standard Step solution scheme is used combined with Manning’s equation to compute cross section conveyance which allows for the construction of backwater and forewater profiles under subcritical, supercritical, and mixed flow regimes. HEC-RAS is capable of simulating structures in natural waterways and constructed channels. Specifically, it has built-in functionality to simulate a variety of bridge types, culverts, roadway approaches/embankments, and roadway encroachments.

Prior to the beginning of the course, participants are strongly encouraged to enroll in the Web-based training entitled, 135091 Basic Hydraulic Principles Review. Mastery of the concepts covered in this WBT is important to successful completion of the Instructor-led training.

OUTCOMES

Upon completion of the course, participants will be able to:

• Manage HEC-RAS files.
• Navigate the HEC-RAS windows.
• Describe the types of hydraulic modeling situations for which one-dimensional application of HEC-RAS is appropriate.
• Describe one-dimensional hydraulic modeling principles used in HEC-RAS including conservation of energy, mass, and momentum.
• Build input data files for use with HEC-RAS for steady state applications with and without roadway encroachments including bridges, culverts, and multiple openings.
• Develop one-dimensional water surface elevations and velocity estimates using the HEC-RAS computer program.
• View and manipulate the output from the HEC-RAS computer program.
• Evaluate hydraulic conditions using HEC-RAS modeling program through various transportation related hydraulic structures including weirs, culverts, and bridges.
• Identify and troubleshoot modeling problems, including those indicated by errors, warnings, and notes.

TARGET AUDIENCE

Federal, State, and local hydraulic engineers who have responsibility for the design and analysis of river systems and stream crossings. Participants should have experience in using the Windows environment and knowledge of the fundamentals of open channel flow, including basic understanding of HEC-2 or WSPRO.
TRAINING LEVEL: Intermediate

FEE: 2022: $800 Per Person; 2023: $800 Per Person

LENGTH: 3 DAYS (CEU: 1.7 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135046

COURSE TITLE
Stream Stability and Scour at Highway Bridges

Please Note: NHI offers a virtual alternative to the ILT Course 135046. To register for the virtual option, search the Course Number “135046V”.

The National Highway Institute’s (NHI) 3-day Stream Stability and Scour at Highway Bridges course provides participants with comprehensive training in the prevention of hydraulic-related bridge failures. Course participants will receive training in conducting a stream stability classification and qualitative analysis of stream response and make estimates of scour at a bridge opening.

Material for the course comes primarily from two Hydraulic Engineering Circulars (HEC), “Evaluating Scour at Bridges” (HEC-18), 5th Edition (2012), and “Stream Stability at Highway Structures” (HEC-20), 4th Edition (2012). The effects of stream instability, scour, erosion, and stream aggradation and degradation are covered. Quantitative techniques are provided for estimating long-term degradation and for calculating the magnitude of contraction scour in a bridge opening. Procedures for estimating local scour at bridge piers and abutments for simple and complex substructures are also provided. A comprehensive workshop integrates qualitative analysis and analytical techniques to determine the need for a Scour Plan of Action for correcting stream instability and scour problems. For this 3-day course, the host agency will need to select 3 optional topics (out of 8 possible topics). Course instructors will contact the host prior to the course to complete a pre-course questionnaire, determine optional topics to be taught, and discuss the course schedule.

This comprehensive training provides preventive techniques for identifying, analyzing, and calculating various hydraulic factors that impact bridge stability. Public and private sector engineers responsible for maintaining the integrity of highway bridges will find it invaluable.

Prior to the beginning of the course, participants are strongly encouraged to enroll in the following Web-based training (WBT) courses: 135091 Basic Hydraulic Principles Review, 135086 Stream Stability Factors and Concepts, and 135087 Scour at Highway Bridges: Concepts and Definitions. Mastery of the concepts covered in these WBTs will enhance participation in the Instructor-led training.

OUTCOMES
Upon completion of the course, participants will be able to:
• Identify indicators of stream instability that can threaten bridges
• Identify stream types and their potential for instability problems
• Describe open-channel hydraulics concepts in bridge scour and stream instability analyses
• Define types of scour that can occur at bridge crossings
• Describe aggradation, degradation, and contraction scour
• Calculate contraction scour for live bed and clear water conditions
• Describe factors that influence scour at piers
• Calculate pier scour for three typical case studies
• Describe the factors that influence scour at abutments
• Describe how HEC-18, HEC-20, and HEC-23 provide analysis procedures for stream instability and bridge scour
• Perform Level I and II analyses
• Classify a stream using two different classification systems
• Conduct a qualitative analysis of stream responses
• Apply the HEC-18 scour equations to determine total scour at a bridge
• Determine the need for a Scour Plan of Action at a scour-critical bridge

TARGET AUDIENCE
Federal, State, and local highway hydraulic, structural, and geotechnical engineers as well as bridge inspectors responsible for maintaining the integrity of highway bridges against possible hydraulic-related problems. Consultants
who perform bridge engineering work are encouraged to attend.

**Training Level:** Intermediate

**Fee:** 2022: $800 Per Person; 2023: $800 Per Person

**Length:** 3 Days (CEU: 2 Units)

**Class Size:** Minimum: 20; Maximum: 30

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135046V

COURSE TITLE
Stream Stability and Scour at Highway Bridges (VILT)

This comprehensive online training provides preventive techniques for identifying, analyzing, and calculating various hydraulic factors that impact bridge stability. Public and private sector engineers responsible for maintaining the integrity of highway bridges will find it invaluable.

Prior to the beginning of the online course, participants are strongly encouraged to enroll in the following Web-based training (WBT) courses: 135091 Basic Hydraulic Principles Review, 135086 Stream Stability Factors and Concepts, and 135087 Scour at Highway Bridges: Concepts and Definitions. Mastery of the concepts covered in these WBTs will enhance participation in the Virtual Instructor-led training.

OUTCOMES
Upon completion of the course, participants will be able to:

- Identify indicators of stream instability that can threaten bridges
- Identify stream types and their potential for instability problems
- Describe open-channel hydraulics concepts in bridge scour and stream instability analyses
- Define types of scour that can occur at bridge crossings
- Describe aggradation, degradation, and contraction scour
- Calculate contraction scour for live bed and clear water conditions
- Describe factors that influence scour at piers
- Calculate pier scour for three typical case studies
- Describe the factors that influence scour at abutments
- Describe how HEC-18, HEC-20, and HEC-23 provide analysis procedures for stream instability and bridge scour
- Perform Level I and II analyses
- Classify a stream using two different classification systems
- Conduct a qualitative analysis of stream responses
- Apply the HEC-18 scour equations to determine total scour at a bridge
- Determine the need for a Scour Plan of Action at a scour-critical bridge

TARGET AUDIENCE
Federal, State, and local highway hydraulic, structural, and geotechnical engineers as well as bridge inspectors responsible for maintaining the integrity of highway bridges against possible hydraulic-related problems. Consultants who perform bridge engineering work are encouraged to attend.

TRAINING LEVEL: Intermediate

FEE: 2022: $800 Per Person; 2023: $800 Per Person

LENGTH: 4 DAYS (CEU: 2 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135047

COURSE TITLE
Stream Stability and Scour at Highway Bridges for Bridge Inspectors

Please Note: NHI offers a virtual alternative to the ILT Course 135047. To register for the virtual option, search the Course Number “135047V”.

This course is an abbreviated presentation of 135046 Stream Stability and Scour at Highway Bridges. The course provides an understanding of and assistance in detecting hydraulic-related problems at highway bridges. The effects of stream instability, scour, erosion, and stream aggradation and degradation are covered. Countermeasures to these problems are discussed. This course concentrates on visual keys to detecting scour and stream instability problems and provides an introduction to portable scour monitoring instrumentation. The course emphasizes inspection guidelines to complete the hydraulic and scour-related coding requirements of the National Bridge Inspection Standards (NBIS). This course can be offered as a 1-day module in conjunction with the 3-day 135046 or as a stand-alone presentation.

NHI Courses 135086 and 135087 are Web-based trainings and are prerequisites for NHI Hydraulics courses 135047 and 135048.

OUTCOMES
Upon completion of the course, participants will be able to:

• Identify stream instability and scour problems at bridges
• Conduct field evaluations for scour and stream instability problems and properly code the results in the National Bridge Inventory
• Recognize countermeasures for stream instability and scour

TARGET AUDIENCE
Federal, State, and local highway bridge inspectors responsible for detecting possible hydraulic-related problems that may threaten the integrity of highway bridges. Consultants who do bridge inspection work for the States may attend if space is available.

TRAINING LEVEL: Basic

FEE: 2022: $400 Per Person; 2023: $400 Per Person

LENGTH: 1 DAYS (CEU: .6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135047V

COURSE TITLE
Stream Stability and Scour at Highway Bridges for Bridge Inspectors (VILT)

This online virtual course is an abbreviated presentation of 135046V Stream Stability and Scour at Highway Bridges. The online course provides an understanding of and assistance in detecting hydraulic-related problems at highway bridges. The effects of stream instability, scour, erosion, and stream aggradation and degradation are covered. Countermeasures to these problems are discussed. This online course concentrates on visual keys to detecting scour and stream instability problems and provides an introduction to portable scour monitoring instrumentation. The online course emphasizes inspection guidelines to complete the hydraulic and scour-related coding requirements of the National Bridge Inspection Standards (NBIS). This online course can be offered as a 2-day module in conjunction with the 4-day 135046V or as a stand-alone online virtual presentation.

NHI Courses 135086 and 135087 are Web-based trainings and are prerequisites for NHI Hydraulics courses 135047V and 135048.

OUTCOMES
Upon completion of the course, participants will be able to:
• Identify stream instability and scour problems at bridges
• Conduct field evaluations for scour and stream instability problems and properly code the results in the National Bridge Inventory
• Recognize countermeasures for stream instability and scour

TARGET AUDIENCE
Federal, State, and local highway bridge inspectors responsible for detecting possible hydraulic-related problems that may threaten the integrity of highway bridges. Consultants who do bridge inspection work for the States may attend if space is available.

TRAINING LEVEL: Basic

FEE: 2022: $400 Per Person; 2023: $400 Per Person
LENGTH: 2 DAYS (CEU: .8 UNITS)
CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135048

COURSE TITLE
Countermeasure Design for Bridge Scour and Stream Instability (2.5-Day)

Please Note: NHI offers a virtual alternative to the ILT Course 135048. To register for the virtual option, search the Course Number “135048V”.

This course provides an overview of countermeasures to highway related failures from the effects of stream instability, scour, erosion, and stream aggradation and degradation problems. Material for the 2.5-day course comes primarily from Hydraulic Engineering Circular (HEC) “Bridge Scour and Stream Instability Countermeasures - Experience, Selection, and Design Guidance” (HEC-23).

Given a stream instability and scour problem, participants will select appropriate countermeasures to correct the problem. The course provides training in recommended strategies for developing a plan that includes appropriate countermeasures, including alternatives to conventional riprap and filter design.

Participants will apply hydraulics analysis techniques to countermeasure design for seven design guideline workshops. The course provides an introduction to fixed and portable instrumentation for scour monitoring using slides and video demonstrations. Participants will receive training in designing a monitoring program to reduce the risk from scour.

NHI Course 135046 provides training in identifying and analyzing stream instability and scour problems at highway bridges and is recommended as a prerequisite for this course.

NHI Courses #135086 and #135087 are Web-based training modules and are prerequisites for NHI Hydraulics courses 135047 and 135048.

OUTCOMES
Upon completion of the course, participants will be able to:

• Develop a plan of action for a scour critical bridge
• Propose countermeasures for stream instability and scour problems
• Identify countermeasures for bridge scour and stream instability using the HEC-23 countermeasures matrix
• Design selected countermeasures with HEC-23 design guidelines

TARGET AUDIENCE
Federal, State, and local highway hydraulic, structural, and geotechnical engineers and bridge inspectors responsible for maintaining the integrity of highway bridges against possible hydraulic-related problems. Consultants who do bridge engineering work are also encouraged to attend.

TRAINING LEVEL: Intermediate

FEES: 2022: $800 Per Person; 2023: $800 Per Person
LENGTH: 2.5 DAYS (CEU: 1.5 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-135048V

Course Title
Countermeasure Design for Bridge Scour and Stream Instability (VILT)

This 4-day online virtual course provides an overview of countermeasures to highway related failures from the effects of stream instability, scour, erosion, and stream aggradation and degradation problems. Material for the 4-day online virtual course comes primarily from Hydraulic Engineering Circular (HEC) “Bridge Scour and Stream Instability Countermeasures - Experience, Selection, and Design Guidance” (HEC-23).

Given a stream instability and scour problem, participants will select appropriate countermeasures to correct the problem. The 4-day online virtual course provides training in recommended strategies for developing a plan that includes appropriate countermeasures, including alternatives to conventional riprap and filter design.

Participants will apply hydraulics analysis techniques to countermeasure design for seven design guideline workshops. The 4-day online virtual course provides an introduction to fixed and portable instrumentation for scour monitoring using slides and video demonstrations. Participants will receive online virtual training in designing a monitoring program to reduce the risk from scour.

NHI Course 135046 provides training in identifying and analyzing stream instability and scour problems at highway bridges and is recommended as a prerequisite for this 4-day online virtual course.

NHI Courses #135086 and #135087 are Web-based training module and are prerequisites for NHI Hydraulics courses 135047 and 135048.

Outcomes
Upon completion of the course, participants will be able to:
• Develop a plan of action for a scour critical bridge
• Propose countermeasures for stream instability and scour problems
• Identify countermeasures for bridge scour and stream instability using the HEC-23 countermeasures matrix
• Design selected countermeasures with HEC-23 design guidelines

Target Audience
Federal, State, and local highway hydraulic, structural, and geotechnical engineers and bridge inspectors responsible for maintaining the integrity of highway bridges against possible hydraulic-related problems. Consultants who do bridge engineering work are also encouraged to attend.

Training Level: Intermediate

Fee: 2022: $800 Per Person; 2023: $800 Per Person

Length: 22 Hours (CEU: 2.2 Units)

Class Size: Minimum: 15; Maximum: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135056

COURSE TITLE
Culvert Design

Please Note: NHI offers a virtual alternative to the ILT Course 135056. To register for the virtual option, search the Course Number “135056V”.

The National Highway Institute’s (NHI) 3-day Culvert Design course provides participants with an in-depth, hands-on understanding of how to hydraulically size and design a highway culvert. The course covers a range of design topics, including allowable headwater at the inlet, permissible outlet velocity, energy dissipation measures, aquatic organism passage, mechanisms of culvert failures, and repair and rehabilitation options.

Material for this 3-day course is primarily derived from the Hydraulic Design Series No. 5 (HDS 5), Hydraulic Design of Highway Culverts textbook, which is provided to participants. Additional references used throughout this course include Hydraulic Engineering Circular No. 14 (HEC-14); Hydraulic Design of Energy Dissipators for Culverts and Channels; HEC-26, Culvert Design for Aquatic Organism Passage; and HEC-9, Debris Control Structures, Evaluation, and Countermeasures. Course topics include culvert design principles and procedures and debris control structures. Throughout the course, participants engage in a number of workshops where problems are completed, both long-hand and with a computer using the FHWA HY-8 Culvert Hydraulic Analysis and Design Program. Additionally, a portable hydraulic flume is set up in the classroom for the participants to observe hydraulic principles associated with various culvert configurations, aquatic organism passage features, and culvert linings.

At the end of this course, participants will be able to apply fundamental engineering concepts, methods, and the HY-8 computer program to analyze and design culvert crossings meeting a variety of hydraulic and environmental design criteria.

Prior to taking this course, participants are strongly encouraged to enroll in the Web-based training (WBT) entitled, 135091 Basic Hydraulic Principles Review. Mastery of the concepts covered in this WBT is important to successful completion of the Instructor-led training.

OUTCOMES
Upon completion of the course, participants will be able to:

• Justify the importance of culvert design
• Explain the overall culvert design process
• Summarize basic hydraulic concepts
• Discuss factors influencing hydraulic performance and design of culverts
• Explain how to calculate culvert outlet velocity
• Apply nomographs and computer methods to design a roadway culvert
• Design culverts that meet aquatic organism passage (AOP) requirements
• Assess impacts of repair and rehabilitation of culverts on hydraulic performance
• Design energy dissipator and debris control structures for culverts
• Design culverts for various situations
• Discuss culvert failures and how they can be prevented

TARGET AUDIENCE
This intermediate-level training course is intended for hydraulic engineers, transportation engineers, and highway designers involved with roadway drainage and culvert design. Environmental scientists with an interest in aquatic organism passage may also benefit from participation in this course.
TRAINING LEVEL: Intermediate

FEE: 2022: $800 Per Person; 2023: $800 Per Person

LENGTH: 3 DAYS (CEU: 2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-135056V

Course Title
Culvert Design (VILT)

The National Highway Institute's (NHI) 4-day Culvert Design online course provides participants with an in-depth, hands-on understanding of how to hydraulically size and design a highway culvert. The online course covers a range of design topics, including allowable headwater at the inlet, permissible outlet velocity, energy dissipation measures, aquatic organism passage, mechanisms of culvert failures, and repair and rehabilitation options.

Material for this 4-day online course is primarily derived from the Hydraulic Design Series No. 5 (HDS-5), Hydraulic Design of Highway Culverts textbook, which is provided to participants. Additional references used throughout this course include Hydraulic Engineering Circular No. 14 (HEC-14); Hydraulic Design of Energy Dissipators for Culverts and Channels, HEC-26, Culvert Design for Aquatic Organism Passage; and HEC-9, Debris Control Structures, Evaluation, and Countermeasures. Online course topics include culvert design principles and procedures and debris control structures. Throughout the online course, participants engage in a number of workshops where problems are completed, both long-hand and with a computer using the FHWA HY-8 Culvert Hydraulic Analysis and Design Program. Additionally, a video demonstration of a portable hydraulic flume is set up for the participants to observe hydraulic principles associated with various culvert configurations, aquatic organism passage features, and culvert linings.

At the end of this online course, participants will be able to apply fundamental engineering concepts, methods, and the HY-8 computer program to analyze and design culvert crossings meeting a variety of hydraulic and environmental design criteria.

Prior to taking this online course, participants are strongly encouraged to enroll in the Web-based training (WBT) entitled, 135091 Basic Hydraulic Principles Review. Mastery of the concepts covered in this WBT is important to successful completion of the Virtual Instructor-led training.

Outcomes
Upon completion of the course, participants will be able to:

- Justify the importance of culvert design
- Explain the overall culvert design process
- Summarize basic hydraulic concepts
- Discuss factors influencing hydraulic performance and design of culverts
- Explain how to calculate culvert outlet velocity
- Apply nomographs and computer methods to design a roadway culvert
- Design culverts that meet aquatic organism passage (AOP) requirements
- Assess impacts of repair and rehabilitation of culverts on hydraulic performance
- Design energy dissipator and debris control structures for culverts
- Design culverts for various situations
- Discuss culvert failures and how they can be prevented

Target Audience
This intermediate-level online training course is intended for hydraulic engineers, transportation engineers, and highway designers involved with roadway drainage and culvert design. Environmental scientists with an interest in aquatic organism passage may also benefit from participation in this online course.
TRAINING LEVEL: Intermediate

FEE: 2022: $800 Per Person; 2023: $800 Per Person

LENGTH: 18 HOURS (CEU: 2 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135065

COURSE TITLE
Introduction to Highway Hydraulics

This course is based on Hydraulic Design Series No. 4 (HDS-4), “Introduction to Highway Hydraulics.” The objective of the course is to provide a broad overview of basic highway drainage concepts. Fundamental hydraulic concepts are discussed, followed by open-channel flow principles and design applications of open-channel flow in highway drainage, including the design of stable channels, and pavement drainage. Closed-conduit concepts and applications in highway drainage include the application of culvert and storm drainage design. The presentation concludes with an introduction to concepts and design of energy dissipators. Detailed design criteria are drawn from other Hydraulic Design Series manuals and Hydraulic Engineering Circulars (HECs), providing a broad overview of all components of highway drainage design with an emphasis on practical applications. A portable hydraulic flume is set up in the classroom for the participants to observe numerous hydraulic principles. The participants take velocity and discharge measurements from the flume while in various setups and use the information to make design calculations.

OUTCOMES
Upon completion of the course, participants will be able to:
• Calculate design discharge using the rational method or regression equation procedures
• Apply the continuity and energy equation to solve practical design problems
• Use the Weir equation to calculate the flow overtopping a roadway embankment
• Use Manning’s equation to calculate velocity or flow depth in simple or compound channels and recognize when this equation cannot be appropriately applied
• Evaluate channel flow conditions (subcritical, critical, or supercritical) using the Froude number
• Design a stable channel using basic hydraulic concepts and Hydraulic Engineering Circular HEC-15
• Apply basic pavement drainage concepts in calculation procedures described in HEC-22
• Design a simple culvert crossing using the procedures in HDS-5
• Design a simple storm drain and calculate the Hydraulic Grade Line (HGL) using the energy equation and HEC-22
• Describe which energy dissipaters are useful for culvert or storm drain applications based on HEC-14

TARGET AUDIENCE
Entry-level engineers or engineering technicians who are performing highway drainage calculations on transportation facilities. It will also be useful as a refresher course on hydraulic fundamentals for experienced personnel.

TRAINING LEVEL: Basic

FEE: 2022: $800 Per Person; 2023: $800 Per Person

LENGTH: 3 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-135067

Course Title
Practical Highway Hydrology

The course provides engineers and designers with the background and skills necessary for the practical application of hydrologic principles to highway design. Participants will be required to work example problems that stress actual design situations. The course is based on the Hydraulic Design Series (HDS) No. 2, “Highway Hydrology” which is also used in the course as a reference manual.

Participants will learn how to select and effectively implement techniques for estimating peak flows and flood hydrographs in gaged and ungaged streams for watersheds of the size typically encountered in highway drainage design. Through a series of optional modules, additional topics including channel routing, wetland hydrology, arid lands hydrology, and snowmelt hydrology are available given host agency preferences.

The overall course objectives enhance the understanding of basic hydrologic concepts and principles as they pertain to highways, and enable application of appropriate hydrologic concepts and tools in the design of drainage facilities and hydraulic structures.

Outcomes
Upon completion of the course, participants will be able to:

• Identify which peak flow design methods are suitable for given watershed characteristics and design requirements
• Estimate times of concentration
• Apply the SCS, regression and rational methods for peak flows
• Analyze gage flows using Log-Pearson III Frequency Analysis
• Develop hydrographs using the unit hydrograph and other techniques
• Perform storage routing calculations
• Design a storm water management facility

Target Audience
Highway engineers and designers who are responsible for designing channels, storm drains, and stormwater detention, as well as those involved in the hydraulic design of bridges and culverts. Attendees will benefit from, but are not required to have, a basic knowledge of hydrologic science. The course is a useful primer for those new to the subject and a thorough review for experienced hydrologic and hydraulic engineers.

Training Level: Intermediate

Fee: 2022: $900 Per Person; 2023: $900 Per Person

Length: 3 DAYS (CEU: 1.8 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-135080

Course Title
Hydrologic Analysis and Design with the WMS Software WCT/WBT

This course, Hydrologic Analysis and Design with the Watershed Modeling System (WMS) Software, provides participants with an introduction to hydrologic modeling in WMS. Participants will learn about terrain and other GIS data acquisition for computing geometric and hydrologic parameters in WMS. They will then learn how to input those parameters into hydrologic models, including the Rational Method, National Streamflow Statistics (NSS), and HEC-HMS, hydrologic models.

This blended WBT/WCT course comprises of 4 WCT lessons and several WBT lessons spread out over four weeks. The course starts with the first WCT to introduce the course, its course learning outcomes, as well as expectations for this course. Following each WCT are WBT lessons which participants complete prior to the next WCT. At the conclusion of each WBT lesson, participants will receive a link to download instructions and data files for independent study exercises. Those exercises will reinforce the topics addressed in the WBT lessons. The WCT lessons will gauge the participants’ mastery of the WBT topics through question and answer and polling the participants. Participants will demonstrate mastery of course content by passing the end-of-course assessment with a score of 70% or higher.

Note: All participants wanting to take this course must register for the session they wish to take. All sessions will be hosted by NHI.

Outcomes
Upon completion of the course, participants will be able to:
• Use digital terrain data to automate drainage basin delineation.
• Identify and use sources of electronic data such as web sites and proprietary data.
• Compute drainage basin parameters commonly used in hydrologic models.
• Use land use and soils geographic data to compute runoff coefficients and curve numbers.
• Set up input data files for industry standard models used to develop peak flow estimates and hydrographs.

Target Audience
The target audience for this course includes FHWA and State Department of Transportation hydraulics and hydrology personnel and other Federal, State, local or consulting engineers who have responsibility for—or desire to work with—the analysis and design of highway river crossings. Course participants should have knowledge of the fundamentals of hydrology and hydrolologic analysis.

Training Level: Basic

Fee: 2022: $825 Per Person; 2023: $825 Per Person

Length: 19 Hours (CEU: 1.9 Units)

Class Size: Minimum: 15; Maximum: 21

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135082

COURSE TITLE
Highways in the Coastal Environment

Over 60,000 miles of roads in the United States are occasionally exposed to coastal surge and waves. Due to these unique design conditions, many highways and bridges suffer damage during coastal storms, including hurricanes and El Nino events. The purpose of this course is to teach important concepts and terminology of coastal science and engineering to highway engineers for use in the planning and design of coastal roads. The course is based on the Hydraulic Engineering Circular (HEC) No. 25, “Highways in the Coastal Environment” (2nd Edition), which is also used in the course as a reference manual.

The course includes the use of a portable flume for demonstration of key concepts and for hands-on participant activities. In addition to the presentation of materials and the flume demonstrations, the course incorporates various workshops and exercises to reinforce key concepts. Topics covered in the course include:
1. Introduction to highways in the coastal environment
2. Waves
3. Tide and water levels
4. Revetment design for coastal embankments
5. Wave loads on bridge decks
6. Coastal geology and sediments
7. Shoreline change and stabilization
8. Road overwash
9. Tidal inlets and coastal bridges

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe coastal engineering design issues related to highways using standard terminology with an understanding of the physical processes unique to this design environment
• Identify appropriate planning, analysis, and design methods for highways and bridges exposed to coastal surge and waves
• Describe differing levels of complexity involving coastal engineering and appropriate qualifications of engineers and coastal engineering consultants to address this complexity in design.

TARGET AUDIENCE
Participants are adult learners with (1) a general civil engineering education and background who currently work in highway planning and design and (2) coastal engineers with some experience in transportation engineering.

TRAINING LEVEL: Intermediate
FEE: 2022: $930 Per Person; 2023: $1050 Per Person
LENGTH: 3 DAYS (CEU: 1.8 UNITS)
CLASS SIZE: MINIMUM: 14; MAXIMUM: 24

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135085

COURSE TITLE
Plan of Action (POA) for Scour Critical Bridges - WEB-BASED
This course supports an FHWA-wide priority and is brought to you at no cost by the Office of Bridges and Structures.

This web-based training (WBT) provides guidance on developing a Plan of Action (POA) for scour critical bridges. It highlights the history of the POA requirement and recommends management and inspection strategies for POA development. The WBT also introduces the FHWA POA Standard Template and illustrates the use of the POA via a case study of a scour critical bridge in a riverine setting.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the purpose of a Plan of Action (POA) for a scour critical bridge
• Identify strategies for developing and implementing a POA
• Describe the sections of the POA Standard Template

TARGET AUDIENCE
Federal, State, and local bridge owners responsible for developing Plan of Actions (POA) for scour critical bridges.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person
LENGTH: 1 HOURS (CEU: 0 UNITS)
CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-135086

Course Title
Stream Stability Factors and Concepts (Prerequisite) WEB-BASED

This training is a prerequisite of another NHI training and is offered at no cost.

This course is intended to help participants understand river processes and stream stability factors and concepts as a prerequisite for NHI Courses 135046, 135047, 135048. Participants will also be introduced to the concepts of water and sediment continuity.

Outcomes
Upon completion of the course, participants will be able to:

- After completing this course participants will be able to describe the factors influencing stream stability that are important to a bridge scour evaluation, and define water and sediment continuity concepts.

Target Audience
Federal, State, and local highway hydraulic, structural, and geotechnical engineers and bridge inspectors responsible for maintaining the integrity of highway bridges against possible hydraulic-related problems. Consultants who do bridge engineering work are also encouraged to take this prerequisite.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 1 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135087

COURSE TITLE
Scour at Highway Bridges: Concepts and Definitions (Prerequisite) WEB-BASED
This training is a prerequisite of another NHI training and is offered at no cost.
This course has been designed to provide an introduction to scour as a prerequisite for NHI courses 135046, 135047, and 135048.

OUTCOMES
Upon completion of the course, participants will be able to:
• Define scour
• Define total scour and each of its three components
• Characterize the time dependency of scour
• Distinguish between live-bed and clear-water scour

TARGET AUDIENCE
Federal, State, and local highway hydraulic, structural, and geotechnical engineers and bridge inspectors responsible for maintaining the integrity of highway bridges against possible hydraulic-related problems. Consultants who do bridge engineering work are also encouraged to take this prerequisite.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-135090

Course Title
Hydraulic Design of Safe Bridges

The National Highway Institute’s (NHI) 3-day 135090 Hydraulic Design of Safe Bridges course provides participants with an intensive training on the hydraulic analysis and design of bridges. The goal of this course is to provide information needed to safely build bridges, while optimizing costs and limiting the impact to property and the environment.

This engaging course includes 12 mandatory lessons that are standard to the course and 3 optional lessons that allow the host agency to customize the course to their particular needs. The optional lessons are: a lesson intended for coastal states with bridges crossing tidal waterways; a lesson that supplements the Unsteady Flow Modeling Concepts lesson and provides additional knowledge of the requirements for one-dimensional unsteady flow modeling; and a lesson that supplements the Scour and Stream Instability Concepts lesson, which enables participants to identify situations requiring sediment transport computations as part of the bridge hydraulics analysis. The host agency will select two optional lessons for the delivery of this course.

Material for this 3-day course is primarily derived from the Hydraulic Design Series No. 7 (HDS 7), Hydraulic Design of Safe Bridges, which is provided to course participants. The course covers significant aspects of bridge hydraulic design including: regulatory topics, specific approaches for bridge hydraulic modeling, hydraulic model selection, bridge design impacts on scour and stream instability, and sediment transport.

Prior to the beginning of the course, participants are strongly encouraged to enroll in the Web-based training (WBT) entitled, 135091 Basic Hydraulic Principles Review. Mastery of the concepts covered in this WBT is important to successful completion of this course.

Outcomes
Upon completion of the course, participants will be able to:

• Describe the ways hydraulic design affects bridge performance and public safety
• Describe hydraulic conditions that occur in the vicinity of bridges
• Identify regulatory requirements and design constraints important to bridge projects
• Describe the input requirements for one-dimensional models
• Identify conditions when one-dimensional modeling is adequate to develop accurate hydraulic results for safe bridge design
• Describe the effects of atypical bridge hydraulic conditions on bridge design
• Perform a qualitative risk assessment for a bridge replacement project
• Describe the properties and input requirements for two-dimensional models
• Distinguish conditions requiring two-dimensional modeling to develop accurate hydraulic results for safe bridge design
• Define the types of scour and stream instability that affect bridge design
• Identify how hydraulic variables are obtained from one- and two-dimensional models
• Assess whether a replacement bridge design alternative will have adequate hydraulic capacity to meet design criteria
• Distinguish conditions requiring unsteady flow modeling to develop accurate hydraulic results for safe bridge design
• Describe additional analyses that contribute to the hydraulic aspects of safe bridge design
• Determine the minimum required foundation depth based on scour conditions
• Assess the likelihood of a bridge project causing adverse hydraulic impacts downstream
• Demonstrate strategies for communicating hydraulic recommendations to various stakeholders

Target Audience
The target audience for 135090 Hydraulic Design of Safe Bridges is primarily members of Federal or State departments of transportation. This typically includes hydraulic engineers with a wide range of experience; however, structural and geotechnical engineers would benefit from an understanding of many of the topics in this course. The complexity of some of the engineering decisions made can have significant impacts on structural and geotechnical designs. Additionally, many other segments of the national and international engineering community may find this course
valuable. Federal, State, and local highway hydraulic engineers responsible for maintaining the integrity of highway bridges against possible hydraulic related problems will rely on this course and HDS 7 for guidance. Consultants who perform bridge engineering work are also encouraged to attend.

**TRAINING LEVEL:** Intermediate

**FEE:** 2022: $800 Per Person; 2023: $750 Per Person

**LENGTH:** 3 DAYS (CEU: 1.8 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

*NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov*
Basic Hydraulic Principles Review (WBT)

Basic Hydraulic Principles Review is designed to familiarize participants with the background concepts, theories, and equations associated with basic hydraulic principles routinely used in highway engineering. NHI strongly suggests that participants complete this self-paced Web-based training (WBT) before attending any Instructor-led hydraulics courses. To fully understand the material presented in NHI hydraulics courses, participants must have an understanding of the basic hydraulic principles presented in this course.

In this course, “hydraulics” is considered to be the determination of various properties and characteristics of flowing water. Such determinations are essential for quantifying the nature of water flow under various conditions. This includes natural features such as streams and rivers, as well as man-made structures such as: bridges, drainage ditches, pipes, culverts, weirs, and spillways.

This WBT consists of three main lessons: Fundamental Concepts, Steady Uniform Flow, and Steady Non-Uniform Flow. After each lesson, knowledge check questions will be presented to test participants’ understanding of the material presented in the lesson. The fundamental principles of hydraulics are used as a basis for designing new structures, as well as determining the flow capacity of existing structures.

135091 Basic Hydraulic Review (WBT) is a prerequisite for ILT courses 135010 (River Engineering), 135041 (HEC-RAS), 135046 (Stream Stability and Scour), and 135056 (Culvert Design). Mastery of the concepts covered in this WBT is important to successful completion of the Instructor-led training.

OUTCOMES

Upon completion of the course, participants will be able to:

• Define fundamental hydraulic concepts of open-channel flow
• Identify steady uniform flow conditions
• Describe the equations used for steady uniform flow
• Identify steady non-uniform flow conditions
• Describe the equations used for steady non-uniform flow

TARGET AUDIENCE

The primary target audience includes Federal and State Department of Transportation Hydraulic Engineering Units and consultants. The course is relevant to anyone involved in bridge designs over waterways, regardless of their technical discipline or whether they are in the private, municipal, State or Federal sectors. This course is designed primarily for entry-level engineers or engineering technicians who deal with hydraulics. It is also beneficial for experienced personnel as a refresher course on hydraulic fundamentals.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135092

COURSE TITLE
Highway Hydrology: Basic Concepts and Methods Web-Based

NHI Web-based Training Course #135092 Highway Hydrology: Basic Concepts and Methods provides training on basic hydrologic concepts that will enable users to determine peak flow for transportation hydraulic structures. For engineers, the course teaches basic hydrologic concepts as a review before taking more advanced hydraulic courses. For non-engineers the course enables learners to better understand hydrologic concepts used by engineers.

The Web-based training uses a range of text, graphics, animations, and problem solving in its three lessons. The first lesson focuses on the hydrologic cycle, associated terms, and the relationship of risk to return period and probability of exceedance. The second lesson explains the variability of storms based on three general types of storms, how variations in storm duration and intensity impact runoff, and the watershed characteristics that influence runoff. The third lesson discusses the Rational Method, the NRCS Graphical Method, and Regression Equations as methods to determine peak flow quantities. At the end of the training, learners will be able to apply basic hydrologic concepts to fundamental methods to determine peak flow for highway drainage and hydraulic structures.

OUTCOMES
Upon completion of the course, participants will be able to:

• Identify the hydrologic cycle processes most important to transportation hydraulic engineering.
• Define the relationship between return period and probability of exceedance in hydraulic design.
• Define the temporal and spatial variations observed in precipitation patterns.
• List watershed characteristics that affect peak flows.

TARGET AUDIENCE
Highway Hydrology: Basic Concepts and Methods is a Web-based training course designed for Federal, state, and local hydraulic engineers, highway designers, design consultants, and environmental specialists who have responsibility for the analysis, design, and permitting of roadway drainage features and stream crossings (both culverts and bridges). Designers and reviewers of erosion and sediment control plans may also benefit from the course.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 2 HOURS (CEU: .2 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-135093

Course Title
Hydraulic Toolbox (Web-Based)

The Federal Highway Administration’s (FHWA) Hydraulic Toolbox software contains a suite of calculators to assist with the routine hydrologic and hydraulic analyses and designs of transportation infrastructure including ditches, curb and gutter sections, drop inlets, weirs, detention basins, bridge foundations, and riprap installations. The calculators adapt procedures and methods found in FHWA Hydraulic Design Series (HDS) and Hydraulic Engineering Circular (HEC) technical publications and in NHI training courses. NHI-135093, Hydraulic Toolbox Web-based Training (WBT) serves as an introduction to the use of most of the Toolbox calculators through a combination of discussion, graphics, examples, and workshop problems. This course includes eight primary lessons, a course summary, and an end-of-course assessment. The lessons in this course include: Toolbox Overview, Rational Method Calculator, Roadway Drainage Calculators, Stormwater Calculators, Channel Calculators, Bridge Scour Calculator, Riprap/Rock Calculators, File Saving & Report Generation, and a concluding course summary.

Upon completing the course, participants will be able to use the Hydraulic Toolbox software to perform routine hydrologic and hydraulic computations for roadway drainage and hydraulic structure design applications.

Note: NHI-135093, Hydraulic Toolbox WBT is a prerequisite for Course 135027, Urban Drainage Design.

Outcomes
Upon completion of the course, participants will be able to:

• Identify the major capabilities of the Hydraulic Toolbox and how they relate to transportation hydraulic engineering
• List the capabilities of the calculators in the Hydraulic Toolbox
• Recognize when to apply each of the calculators in the Hydraulic Toolbox
• Apply the Hydraulic Toolbox to complete hydrologic and hydraulic computations
• Identify the steps to generate Hydraulic Toolbox reports

Target Audience
The target audience is comprised of federal, state, and local hydraulic engineers, highway designers, design consultants, and environmental specialists who have responsibility for the analysis, design, and permitting of roadway drainage features and stream crossings.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 3 HOURS (CEU: .3 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135094

COURSE TITLE
Culvert Hydraulic Analysis and Design Program (HY-8) Web-Based

NHI web-based Training Course 135094, Culvert Hydraulic Analysis and Design Program (HY-8), provides training on the use of the Federal Highway Administration’s (FHWA) HY-8 computer program to complete culvert analysis and design calculations commonly performed by Civil Engineers and others involved in roadway design.

This web-based training uses a combination of text, graphics, examples, animations, and workshop problems in its six primary lessons:

HY-8 Overview
Conventional Design Scenarios
Rehabilitative Linings/Common Pitfalls in the Use of HY-8
Special Geometries
Energy Dissipation
Project File Management and Report Generation

Upon completing the course, participants will be able to apply the HY-8 software to analyze and design culverts in many commonly encountered situations.

Note: NHI 135094, Culvert Hydraulic Analysis and Design Program (HY-8) (Web-Based) is a prerequisite for Course 135080, Hydrologic Analysis and Modeling with WMS. Mastery of the concepts covered in this WBT is important to successful completion of Course 135080.

OUTCOMES
Upon completion of the course, participants will be able to:

• List the primary capabilities of HY-8
• Identify inlet and outlet control situations from the culvert summary tables
• List the material types used in culverts
• List the material shapes that may be analyzed within HY-8
• Select a culvert from a list of available culverts that satisfies headwater and outlet velocity criteria by using HY-8.
• Predict the effect of lining material (new or rehabilitated) on headwater
• Identify common pitfalls in using HY-8 in conventional design scenarios
• Identify situations appropriate for application of special culvert geometries
• Identify situations requiring energy dissipation to mitigate scour or high outlet velocities.
• Select an appropriate energy dissipator by using HY-8.
• Identify the steps to generate customized HY-8 reports.

TARGET AUDIENCE
The target audience is comprised of federal, state, and local hydraulic engineers, highway designers and design consultants who have responsibility for the analysis, design, and review of culverts. Length of service with an organization or status within an organization would not be a factor in that this training could apply to anyone that has a need for hands-on use of HY-8.
**TRAINING LEVEL:** Basic

**FEE:** 2022: $0 Per Person; 2023: $0 Per Person

**LENGTH:** 2 HOURS (CEU: .2 UNITS)

**CLASS SIZE:** MINIMUM: 0; MAXIMUM: 0

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-135095

Course Title
Two-Dimensional Hydraulic Modeling of Rivers at Highway Encroachments

Please Note: NHI offers a virtual alternative to the ILT Course 135095. To register for the virtual option, search the Course Number “135095V”.

Two-Dimensional Hydraulic Modeling of Rivers at Highway Encroachments (135095) provides participants with instruction to understand and appropriately apply 2D hydraulic models of rivers in highway encroachment situations. The course focuses on the use and application of the SRH-2D model, developed by the US Bureau of Reclamation (USBR) and sponsored by the USBR and FHWA. Modeling principles and techniques will be presented using the latest version of the Surface Water Modeling System (SMS), a graphical pre-and post-processor for several 2D modeling engines, including SRH-2D. Specific lesson topics include model terrain and background data, modeling parameters, mesh development, modeling hydraulic structures, calibration, model review, extracting bridge scour parameters, and more.

SRH-2D, Sedimentation and River Hydraulics - Two-Dimensional model, solves the 2D dynamic wave equations for water surface elevation, water depth, and depth-averaged velocity using the finite volume numerical method. Other output variables include Froude number, bed shear stress. The model uses a flexible mesh and adopts very robust and stable numerical schemes with a seamless wetting-drying algorithm. The model can be run in steady state or unsteady mode and can simulate all flow regimes simultaneously without the need for special treatments. Computations at hydraulic structures are performed using standard FHWA methods and procedures, including HY-8, which is embedded in the program to perform Culvert calculations. Pressure flow conditions at bridges and large culverts are computed at each element to provide detailed results for simple to fairly complex bridge configurations.

SMS is capable of interactively building the finite volume mesh for SRH-2D, as well as the input data files necessary to use the SRH-2D model. The program also has numerous options for graphically displaying the output from SRH-2D to effectively communicate the results of the hydraulic analysis to a non-technical audience. The SMS-SRH-2D interface also includes a Bridge Scour Tool that may be used to extract the hydraulic parameters from multiple simulations to support bridge scour computations in the FHWA Hydraulic Toolbox or other user preferred methods.

Outcomes
Upon completion of the course, participants will be able to:

- Describe the differences between 1D and 2D hydraulic models
- Use background data in SMS for 2D modeling projects
- Use SMS to setup and run 2D models
- Generate and review 2D model results
- Insert structures into 2D models
- Evaluate 2D hydraulic parameters for use in bridge scour analysis

Target Audience
The target audience for this course is FHWA and state Department of Transportation hydraulics personnel and other Federal, state, local or consulting engineers who have responsibility for, or desire to work with, the hydraulic analysis and design of highway river crossings. Course participants should have knowledge of the fundamentals of open channel flow hydraulics. It is suggested (but not required) that course participants take NHI course 135091-Basic Hydraulic Principles Review (WBT).
TRAINING LEVEL: Intermediate

FEE: 2022: $950 Per Person; 2023: $850 Per Person

LENGTH: 3 DAYS (CEU: 2.1 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
This course, NHI-135095A SRH-2D Model Data Files, Diagnostics and Verifying 2D Model Results, is a follow-on Web-conference Training (WCT) to NHI-135095 Two-Dimensional Hydraulic Modeling of Rivers at Highway Encroachments, a 3-day Instructor-led Training (ILT). This course provides participants an introduction to the various data files used for SRH-2D input, the files created by SRH-Pre and the output files created by SRH-2D. Participants will become familiar with the file formats, how the files are used and learn about the various diagnostic messages output by SRH-2D. Participants will also learn how to use monitor lines in SRH-2D and how to use the output from the monitor lines to verify model convergence.

This course presents material in a series of three Web-conference training sessions, supplemented by two hands-on exercises. The sessions are as follows: Session 1: Introduction and Model Verification, Session 2: Data Flow in SRH-2D, Output Files and Diagnostics; and Session 3: Summary and Exercise Review.

As part of the course materials, a set of independent study exercise data files and demonstration files will be provided. The data files for the independent study sessions are distributed at the end of the corresponding lesson. The demonstration data files are used at designated demonstration times.

Offerings of this course are intended to be delivered within a given work week, with Session 1 typically delivered on a Monday, Session 2 on a Wednesday, and Session 3 on a Friday. Alternate timing for the sessions can be scheduled at the request of the host, but the course is not intended to be conducted over a long period of time.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe how to use plots in SMS to verify model results.
• Use plots in SMS to verify SRH-2D simulation results.
• Identify the data flow and file structure for SRH-2D
• List the function of the data files exported by SMS for input into SRH Pre
• List the function of the SRH-2D input files created by SRH Pre
• List and describe the function of the data files created by SRH-2D
• Explain how diagnostic messages can help in running and debugging SRH-2D models

TARGET AUDIENCE
The target audience for this course are FHWA and State Department of Transportation hydraulics personnel and other Federal, State, local or consulting engineers who have responsibility for, or desire to work with, the hydraulic analysis and design of highway river crossings. Course participants should have knowledge of the fundamentals of open channel flow hydraulics. It is suggested (but not required) that course participants take NHI-135091 Basic Hydraulic Principles Review (WBT).

TRAINING LEVEL: Intermediate

FEES: 2022: $150 Per Person; 2023: $150 Per Person

LENGTH: 8 HOURS (CEU:.8 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 15

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
**Course Number**
FHWA-NHI-135095B

**Course Title**
Model Terrain Development with Various Data Sources WCT

This course, NHI-135095B SRH-2D Model Terrain Development with Various Data Sources, is a follow-on Web-conference Training (WCT) to NHI-135095 Two-Dimensional Hydraulic Modeling of Rivers at Highway Encroachments, a 3-day Instructor-led Training (ILT). This course provides participants instruction to learn how to process and effectively use LiDAR and other elevation format types in defining geometry for 2D hydraulic models. Participants will learn how to identify potential data issues. Participants will also learn various methods for modifying the geometry for the simulation and will be able to use the software to import data from other data sources and export data to be used in formats compatible with other standard programs.

This course presents material in a series of three Web-conference training sessions, supplemented by two hands-on exercises. The sessions are as follows: Session 1: Introduction, Working with Topographic Data, Bathymetric Data, and Channel Creation; Session 2: Combining and Exporting Data, Incorporating Terrain Into a Mesh; and Session 3: Summary and Exercise Review.

As part of the course materials, a set of independent study exercise data files and demonstration files will be provided. The data files for the independent study sessions are distributed at the end of the corresponding lesson. The demonstration data files are used at designated demonstration times.

Offerings of this course are intended to be delivered within a given work week, with Session 1 typically delivered on a Monday, Session 2 on a Wednesday, and Session 3 on a Friday. Alternate timing for the sessions can be scheduled at the request of the host, but the course is not intended to be conducted over a long period of time.

**Outcomes**
Upon completion of the course, participants will be able to:

- Define the LiDAR data format and file structure for SRH-2D.
- List additional data formats supported by SMS and SRH-2D.
- Identify potential issues with elevation datasets.
- List the sources/data formats of bathymetric data supported by SMS.
- Load bathymetric data and create representations of channel bed surfaces for inclusion in an SRH-2D simulation.
- Combine multiple data sources.
- Verify compatibility of multiple data sources.
- Export geometric data (surfaces) for use outside of SMS.
- List the tools for identifying and defining features in a terrain surface.
- List the principal techniques for incorporating terrain features into a mesh.
- Evaluate how well a mesh represents a terrain source.

**Target Audience**
The target audience for this course is FHWA and State Department of Transportation hydraulics personnel and other Federal, State, local or consulting engineers who have responsibility for, or desire to work with, the hydraulic analysis and design of highway river crossings. Course participants should have knowledge of the fundamentals of open channel flow hydraulics. It is suggested (but not required) that course participants take NHI-135091 Basic Hydraulic Principles Review (WBT).
Training Level: Intermediate

Fee: 2022: $150 Per Person; 2023: N/A

Length: 9 Hours (CEU: .9 units)

Class Size: Minimum: 15; Maximum: 25

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-135095V

COURSE TITLE
Two-Dimensional Hydraulic Modeling of Rivers at Highway Encroachments
(VIRTUAL DELIVERY)

Course updated as of July 2022

NHI-135095V Two-Dimensional Hydraulic Modeling of Rivers at Highway Encroachments is a 4-day virtual online training that provides a well-balanced mix of lessons, demonstrations, and exercises for a comprehensive introduction to two-dimensional modeling concepts, including: background data necessary to support a model, hydraulic modeling parameters, mesh development, model simulation parameters, model calibration, hydraulic structures, and reviewing two-dimensional model results. Extracting hydraulic parameters for use in bridge scour evaluation is also discussed. Each concept is demonstrated, and participants are given hands-on exercises to apply what they have learned. Once all modeling concepts are covered, a comprehensive exercise is provided for participants to apply their skills on a project from start to finish. Participants will receive a participant workbook that includes hard copies of presentation slides and step-by-step exercises. Electronic data needed for the exercises will also be provided. Following completion of this course, participants should recognize situations where two-dimensional modeling is preferred and use SMS to successfully compile, execute, and review results for a SRH-2D model on a bridge or other hydraulic structure project.

NOTE: the community version of the SMS software package is sufficient for the training course, but a temporary pro version is provided to all participants to enable testing of the additional features.

OUTCOMES
Upon completion of the course, participants will be able to:

• Recognize the differences between 1D and 2D hydraulic models
• Use background data in SMS for 2D modeling projects
• Use SMS to setup and run 2D models
• Visualize and review 2D model results
• Add structures to 2D models
• Evaluate 2D hydraulic parameters for use in bridge scour analysis

TARGET AUDIENCE
The target audience for this course is FHWA and state Department of Transportation hydraulics personnel and other Federal, state, local or consulting engineers who have responsibility for, or desire to work with, the hydraulic analysis and design of highway river crossings.

TRAINING LEVEL: Intermediate

FEE: 2022: $950 Per Person; 2023: $950 Per Person

LENGTH: 21 HOURS (CEU: 2.1 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 23

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-135096

Course Title
Roadway Interactions with Rivers and Floodplains: Basic Concepts

NHI Course 135096, “Roadway Interactions with Rivers and Floodplains: Basic Concepts” is a web-based training (WBT) designed to familiarize participants with the concepts and terminology used to describe and discuss basics of river forms, sediment transport, and channel changes and their relation to transportation infrastructure in the river environment. This course provides an introduction suitable for anyone who will be planning, designing, constructing, or operating transportation projects in river environments.

NHI strongly suggests that participants complete this self-paced WBT before attending the 3-day companion instructor-led training (ILT) course, “Roadway Interactions with Rivers and Floodplains” (NHI 135097).

Bridges, culverts, and roadways can impact rivers, floodplains, and their habitats, while channel dynamics - including erosion, sediment deposition, and channel shift - often affect transportation infrastructure. Therefore, this course addresses these interactions so that planners and engineers create resilient and sustainable highway structures with the goals of providing cost-effective hydraulic performance, while limiting adverse environmental impacts.

This WBT consists of six main lessons: 1) Attributes of Rivers and Transportation Infrastructure Projects; 2) River and Floodplain Functions; 3) Adverse Transportation Infrastructure/River Environment Interactions; 4) Potential Solutions to Typical Adverse Transportation Infrastructure/River Environment Interactions; 5) Risk, Resilience, Reliability, and Sustainability; and 6) Regulations and Permits. As a part of each lesson, knowledge check questions will be presented to test participants’ understanding of the material presented in each lesson.

Outcomes
Upon completion of the course, participants will be able to:
- Describe type of encroachments cause by transportation infrastructure projects in the river environment
- Describe the key attributes of rivers
- Describe the primary river and floodplain functions
- Describe potential adverse interactions between transportation infrastructures and the river environment
- Describe how protecting river functions in each phase of the transportation project life cycle fosters infrastructure resilience, reliability, and sustainability while reducing risk
- Describe potential solutions to typical adverse infrastructure/river interactions

Target Audience
The target audience includes planners, environmental scientists, permit reviewers, roadway designers, river scientists, engineers (generalist, hydraulic, structural, and operations), construction managers, maintenance workers, and any other transportation industry professionals typical of a multi-disciplinary team involved in the planning, permitting, design, construction, and maintenance of transportation infrastructure.

Training Level: Basic
Fee: 2022: $0 Per Person; 2023: $0 Per Person
Length: 4 HOURS (CEU: .4 UNITS)
Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-135097

Course Title
Roadways Interactions with Rivers and Floodplains (ILT)

135097 Roadway Interactions with Rivers and Floodplains is a three-day Instructor-led Training (ILT) that targets a wide-ranging audience of transportation and partner agency professionals and addresses interactions of roadways with rivers, floodplains, and ecosystems. The course introduces the concepts of risk, resilience, reliability, and sustainability as they relate to the planning, design, construction, operation, maintenance, and monitoring of transportation infrastructure in the river environment. Participants will learn about connections and relationships between transportation infrastructure and the natural environment, and sediment transport modeling input requirements and analysis techniques. The course includes methods for evaluating river forms and anticipated channel changes. Participants are provided tools for predicting short- and long-term channel changes over river reaches and localized changes at road crossings. These concepts are presented in lessons and practiced during a progressive workshop consistent with other FHWA resources, including 142085 Addressing Climate Resilience in Highway Project Development and Preliminary Design. Hydraulic Engineering Circular 16 (HEC-16) Highways in the River Environment: Roads, Rivers, and Floodplains, Second Edition is the companion technical reference document for this course.

Outcomes
Upon completion of the course, participants will be able to:

• List reasons why consideration of river forms, functions, and channel changes will reduce risk and increase resilience and reliability of transportation infrastructure in the river environment.
• Identify river processes and relate these processes to change and response.
• List types of information obtained with a desk study before a site visit.
• Evaluate available information to plan a site reconnaissance.
• Describe the hydrologic and hydraulic requirements for geomorphic and sediment transport analyses.
• Describe types of analyses that can be used to evaluate trends in channel form.
• Describe how roadway encroachments impact ecosystems in river corridors and wetlands.
• Describe the components of a sediment continuity analysis.
• Describe input requirements and limitations of sediment transport models.
• Describe common channel instability problems and suitable solutions for restoring channel function.
• Describe fluvial performance standards and design alternatives to accommodate channel evolution, and environmental and future conditions that will lead to resilient bridge and culvert replacements.

Target Audience
The target audience includes Federal, State, and local transportation professionals and their consultants engaged in planning, design, permitting, construction, operation, and maintenance of roadway crossings of rivers and roadways in floodplains. FHWA Division Office personnel who must read, interpret, and apply Federal regulations and guidance that affect Federal-aid projects in riverine environments will also benefit from this course.

Training Level: Intermediate

Fee: 2022: $1070 Per Person; 2023: $1070 Per Person

Length: 3 Days (CEU: 1.8 Units)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Bridge Management Fundamentals

When the average citizen commutes to work or runs errands, they are relying on us, public transportation agencies, to keep their bridges safe and available for use. It is their expectation that we keep their bridges serviceable and at the lowest life-cycle cost possible. Bridge management systems will help your agency to efficiently balance the various bridge needs against available resources. The Bridge Management Fundamentals course describes a bridge management system and walks through the process of selecting and implementing the right bridge management software for your agency. Throughout the course, you will learn direct from agencies with mature and successful bridge management systems about how they get the most utility from their system.

OUTCOMES

Upon completion of the course, participants will be able to:

• Explain the need for a BMS
• Describe a typical BMS organizational structure
• Describe the seven components of a BMS
• Describe tools that are used as part of the bridge management process
• Describe an implementation plan for a comprehensive BMS
• Describe effective practices when using BMSs
• Identify successful applications of BMS components by agencies
• Describe the bridge management process as it relates to an agency business model
• Describe how to address risk

TARGET AUDIENCE

The target audience includes Federal, State, and local bridge program managers; bridge management engineers; bridge management practitioners; transportation planners; and project planning and programming personnel. Additionally, transportation performance management team members, transportation asset management team members, bridge preservation and maintenance engineers, the financial management team, bridge inspectors, and bridge designers may benefit from this training. All participants should have knowledge of basic bridge terminology.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 4 HOURS (CEU: .4 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Performance-Based Management of Highway Bridges

The traditional approach to bridge management has focused on identifying the worst performing structures in the inventory and addressing their deficiencies before anything else. But as inventories expand and age and as budgets shrink, most agencies discover that even as they address the worst bridges in the inventory, other bridges that could have been saved through preservation activities slip into deficiency. Today, the public expects transportation agencies to adopt a performance-based management approach that will achieve the highest level of performance possible and make the most effective use of available funds. The Performance-based Management of Bridges course uses video-based testimonies from transportation professionals to illustrate the ways in which their agencies have used performance-based management to estimate the cost-effectiveness of decisions and assess risk.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe how a bridge management system supports a performance-based bridge program.
• Identify framework for a performance-based management business model;
• Describe the development of performance measures;
• Describe methods for determining cost-effectiveness of actions;
• Describe considerations when assessing risk; and
• Describe strategies for communicating and reporting highway bridge performance-based management actions and results to other agency stakeholders and the public

TARGET AUDIENCE
The target audience includes Federal, State, and local bridge program managers; bridge management engineers; bridge management practitioners; transportation planners; and project planning and programming personnel. Additionally, transportation performance management team members, transportation asset management team members, bridge preservation and maintenance engineers, the financial management team, bridge inspectors, and bridge designers may benefit from this training. All participants should have knowledge of basic bridge terminology.

TRAINING LEVEL: Basic

FEE: 2022: $50 Per Person; 2023: $0 Per Person

LENGTH: 4 HOURS (CEU: .4 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-131116

Course Title
Pavement Management Fundamentals WBT

Pavement Management Fundamentals is a self-paced training that describes the basic principles and structure of a pavement management program. Specifically, the course describes the purpose of pavement management, its core components, and the critical role pavement management plays supporting other highway transportation agency functions and programs, such as planning and programming, pavement design, and asset management.

The intent of this course is not to explain how core pavement management functions are conducted. Instead, it is to explain what the functions are, the inputs upon which they rely, and the value they provide to both pavement management and other agency business processes and programs.

Outcomes
Upon completion of the course, participants will be able to:

• Describe an effective pavement management program and the value it provides to the agency.
• Describe the critical role of data and data collection in a pavement management program.
• Explain the impact of quality and quality management in a pavement management program.
• Explain how to manage pavement data so it can be used effectively.
• Describe the activities involved in setting up PMS analyses.
• Describe how PMS products are used to support agency planning and programming decisions.
• Describe effective pavement management reporting processes.

Target Audience
The course targets practitioners who manage roadways and highways with little to no experience in pavement management or those interested in refreshing their knowledge about pavement management programs or systems. This may include people assigned pavement management duties, such as Data Collectors, Data Analysts, and Pavement Managers, and those using pavement management information to complete tasks, such as Transportation Asset Management, Maintenance, Planning, or Design personnel from federal, state, local, and tribal agencies. In addition, roadway or highway agency administrators and leaders may complete the first module, Introduction to Pavement Management Concepts, to familiarize themselves with the role pavement management fills in a transportation agency.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 3 HOURS (CEU: .3 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134001

Course Title
Principles and Applications of Highway Construction Specifications

Well-written highway construction specifications are those that can be interpreted accurately to minimize confusion and reduce owner-contractor disputes. Across the country, current practices, standards, and requirements for writing specifications are changing. Agencies also are using effective specifications to manage risk and support alternative contracting methods.

NHI 134001 Principles of Writing Highway Construction Specifications is a highly engaging, two-day, instructor-led training session. It includes content that highlights the role of specifications as contract documents and tools for assigning risk. Course participants engage in lessons and practice sessions to identify types of specifications, select the most appropriate type for a given project, and generate an original, effective highway construction specification.

Course content emphasizes the use of effective grammar and writing style so that the learners can generate specifications that are correct, consistent, clear, complete, and concise.

Outcomes
Upon completion of the course, participants will be able to:

• Explain the purposes of a specification.
• Explain how specifications are used to assign risk and influence the behavior of different parties, within a given scenario.
• Compare the functions of Standard and Supplemental Specifications with the functions of Special Provisions.
• Explain how the “order of precedence” affects writing specifications and preparing plans.
• Describe the purpose of the General Provisions.
• Explain how a consistent writing style can affect the interpretation of specifications.
• Complete a checklist of the information needed before writing or revising a specification.
• Explain the potential benefits of writing in the active voice.
• Rewrite passive voice sentences into the active voice.
• Evaluate specifications to determine the need for imperative or indicative mood.
• State the five Cs used in specification writing. (Note: the five Cs include: correct; consistent; clear; complete; concise.)
• Explain each element of the AASHTO five-part format.
• Identify potential ambiguities in the wording, given a sample specification.
• Identify the potential benefits of each of the five Cs, given a sample specification.
• Apply the five Cs and the host agency’s preferred format to revise the specification, given a sample specification.
• Write a new specification to a given set of criteria using the five Cs and the host agency’s preferred format, given a sample specification.
• Compare method versus end-result specifications.
• Relate the type of specification to the allocation of risk.
• Write an end-result specification to replace a method specification, given an excerpt from a method specification.

Target Audience
This course is designed primarily for individuals who write, review, and implement an agency’s contract specifications. Participants might represent Federal, State, and local transportation agencies; other public agencies; contractors; and consultant firms. Individuals who do not write specifications but may contribute to their development, as well as those who use specifications, could also benefit from this course and the interaction with their classmates. Such participants might include personnel from environmental, materials, or construction sections or units; legal departments; work zone and safety professionals; contractor personnel; and any others involved with the design and construction of transportation facilities.
TRAINING LEVEL: Intermediate

FEE: 2022: $550 Per Person; 2023: $800 Per Person

LENGTH: 2 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134001T

COURSE TITLE
Principles and Applications of Highway Construction Specifications (EXAM ONLY FOR 134001V)

THIS IS THE EXAM ONLY AND CEUs WILL BE AWARDED FOR 134001V.

Well-written highway construction specifications are those that can be interpreted accurately to minimize confusion and reduce owner-contractor disputes. Across the country, current practices, standards, and requirements for writing specifications are changing. Agencies also are using effective specifications to manage risk and support alternative contracting methods.

NHI 134001 Principles of Writing Highway Construction Specifications is a highly engaging, two-day, instructor-led training session. It includes content that highlights the role of specifications as contract documents and tools for assigning risk. Course participants engage in lessons and practice sessions to identify types of specifications, select the most appropriate type for a given project, and generate an original, effective highway construction specification.

This is not a grammar course; however, adequate course content emphasizes the use of basic grammar and writing style so that the learners can generate specifications that are correct, consistent, clear, complete, and concise.

OUTCOMES

Upon completion of the course, participants will be able to:

• Explain the purposes of a specification.
• Explain how specifications are used to assign risk and influence the behavior of different parties, within a given a scenario.
• Compare the functions of Standard and Supplemental Specifications with the functions of Special Provisions.
• Explain how the “order of precedence” affects writing specifications and preparing plans.
• Describe the purpose of the General Provisions.
• Explain how a consistent writing style can affect the interpretation of specifications.
• Complete a checklist of the information needed before writing or revising a specification.
• Explain the potential benefits of writing in the active voice.
• Rewrite passive voice sentences into the active voice.
• Evaluate specifications to determine the need for imperative or indicative mood.
• State the five Cs used in specification writing. (Note: the five Cs include: correct; consistent; clear; complete; concise.)
• Explain each element of the AASHTO five-part format.
• Identify potential ambiguities in the wording, given a sample specification.
• Identify the potential benefits of each of the five Cs, given a sample specification.
• Apply the five Cs and the host agency's preferred format to revise the specification, given a sample specification.
• Write a new specification to a given set of criteria using the five Cs and the host agency's preferred format, given a sample specification.
• Compare method versus end-result specifications.
• Relate the type of specification to the allocation of risk.
• Write an end-result specification to replace a method specification, given an excerpt from a method specification.

TARGET AUDIENCE

This course is designed primarily for individuals who write, review, and implement an agency’s contract specifications. Participants might represent Federal, State, and local transportation agencies; other public agencies; contractors; and consultant firms. Individuals who do not write specifications but may contribute to their development, as well as those who use specifications, could also benefit from this course and the interaction with their classmates. Such participants might include personnel from environmental, materials, or construction sections or units; legal departments; work
zone and safety professionals; contractor personnel; and any others involved with the design and construction of transportation facilities.

**Training Level:** Intermediate

**Fee:** 2022: $0 Per Person; 2023: N/A

**Length:** 1 Hours (CEU: 0 Units)

**Class Size:** Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134001V

COURSE TITLE
Principles and Applications of Highway Construction Specifications (Virtual Delivery of 134001)

Well-written highway construction specifications are those that can be interpreted accurately to minimize confusion and reduce owner-contractor disputes. Across the country, current practices, standards, and requirements for writing specifications are changing. Agencies also are using effective specifications to manage risk and support alternative contracting methods.

NHI 134001V - Principles of Writing Highway Construction Specifications is now offered on-line as a virtual course. A virtual instructor-led training provides 100% remote learning while ensuring participants have access to expert instructors, workshop activities, and engaging peer-to-peer discussions. Sessions are typically held as half-day events over four days.

It includes content that highlights the role of specifications as contract documents and tools for assigning risk. Course participants engage in lessons and practice sessions to identify types of specifications, select the most appropriate type for a given project, and generate an original, effective highway construction specification.

Course content emphasizes the use of effective grammar and writing style so learners can generate specifications that are correct, consistent, clear, complete, and concise.

Register today to experience a highly engaging, online instructor-led training session from the convenience of your home and/or office anywhere in the country, remotely.

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain the purposes of a specification.
• Explain how specifications are used to assign risk and influence the behavior of different parties, within a given scenario.
• Compare the functions of Standard and Supplemental Specifications with the functions of Special Provisions.
• Explain how the “order of precedence” affects writing specifications and preparing plans.
• Describe the purpose of the General Provisions.
• Explain how a consistent writing style can affect the interpretation of specifications.
• Complete a checklist of the information needed before writing or revising a specification.
• Explain the potential benefits of writing in the active voice.
• Rewrite passive voice sentences into the active voice.
• Evaluate specifications to determine the need for imperative or indicative mood.
• State the five Cs used in specification writing. (Note: the five Cs include: correct; consistent; clear; complete; concise.)
• Explain each element of the AASHTO five-part format.
• Identify potential ambiguities in the wording, given a sample specification.
• Identify the potential benefits of each of the five Cs, given a sample specification.
• Apply the five Cs and the host agency’s preferred format to revise the specification, given a sample specification.
• Write a new specification to a given set of criteria using the five Cs and the host agency’s preferred format, given a sample specification.
• Compare method versus end-result specifications.
• Relate the type of specification to the allocation of risk.
• Write an end-result specification to replace a method specification, given an excerpt from a method specification.

TARGET AUDIENCE
This course is designed primarily for individuals who write, review, and implement an agency’s contract specifications.
Participants might represent Federal, State, and local transportation agencies; other public agencies; contractors; and consultant firms. Individuals who do not write specifications but may contribute to their development, as well as those who use specifications, could also benefit from this course and the interaction with their classmates. Such participants might include personnel from environmental, materials, or construction sections or units; legal departments; work zone and safety professionals; contractor personnel; and any others involved with the design and construction of transportation facilities.

**TRAINING LEVEL:** Intermediate

**FEE:** 2022: $550 Per Person; 2023: $650 Per Person

**LENGTH:** 12 HOURS (CEU: 1.2 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134112

COURSE TITLE
Principles and Practices for Enhanced Maintenance Management Systems

Is your agency in the process of enhancing its maintenance management capabilities?

Are you interested in learning more about developing effective performance measures for maintenance activities?

If so, join us for a blended training course that features both independent study material and facilitated Web-conferences.

You will be introduced to the methods and practices used in an enhanced maintenance management system (MMS) to effectively maintain and operate a highway network. You will explore the principles and practices of using MMS to effectively examine efficient maintenance and operation of a highway network. Throughout the course, you will learn by participating in activities and assignments specific to using MMS.

The course materials rely heavily on the AASHTO Guidelines for Maintenance Management Systems, Transportation Asset Management Guide, and several other recent publications on the topic. To illustrate the application of the principles, the course materials are supplemented with examples from State and local highway agencies.

Participant Responsibilities:
- 7 Web-based lessons (Duration: 1-1.5 hrs each)
- 3 Web-conferences (Duration: 2 hours each)

To obtain your certificate, you must complete all Web-based lessons and Web-conferences. To receive Continuing Education Units (CEUs), you must also pass the online test at the end of the course. You will need your own computer with an Internet connection as well as a telephone line in order to participate.

OUTCOMES
Upon completion of the course, participants will be able to:
- Compare and contrast a first generation MMS with an enhanced MMS
- Describe the terms “outcome-based” and “performance-based” and how they pertain to an enhanced MMS
- Describe the use of service levels to support the programming and budgeting activities incorporated into an MMS
- Identify the types of systems that should be integrated with an MMS and provide several examples of the types of data that should interface between each system
- List the potential benefits to be realized by fully integrating an enhanced MMS
- Identify several steps that will advance an agency’s current maintenance management practices now and in the future

TARGET AUDIENCE
The target audience for this course includes State and local maintenance engineers, maintenance supervisors, asset managers, and their industry counterparts. The course is specifically for individuals who are responsible for directing and managing maintenance operations and budgets, maintenance project and treatment selection, and/or the monitoring of system conditions.

TRAINING LEVEL: Basic

FEE: 2022: $225 Per Person; 2023: $225 Per Person

LENGTH: 15 HOURS (CEU: 1.5 UNITS)

CLASS SIZE: MINIMUM: 10; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-136002

COURSE TITLE
Financial Planning for Transportation Asset Management

Financial plans provide an excellent opportunity for agencies to demonstrate to constituents that they are responsibly managing their transportation assets. Get the information you need to develop or further develop your TAM Financial Plans!

The blended training approach to NHI 136002 Financial Planning for Transportation Asset Management (TAM) includes a brief (one-hour) Web-based training (WBT) component. The WBT builds foundational knowledge of financial planning in the context of TAM and reviews common vocabulary and background information.

Then, an instructor-led, classroom-based event completes the blended approach. Over the course of 1.5 days, participants discover the key content areas of a financial plan and explore the approaches to developing one. A facilitator guides small working groups as they create a financial plan outline that includes each content area. The groups identify gaps that could reduce the plan’s effectiveness and identify the next steps their agency must take to fully develop the financial plan. The teams’ financial plan outlines are evaluated by the instructor. Participants leave the classroom with a useful work product that can be further developed and used in the agency’s financial planning process.

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe the financial plan’s purpose and benefits.

• Create an outline that identifies the components of the financial plan and describes for each component: the required content; key factors that influence the development; the stakeholders involved in the development of the component; and the roles and responsibilities of each stakeholder.

• Identify gaps in policies, data, and processes that need to be addressed by your agency to develop the financial plan, using the financial plan outline.

• Recommend the next steps the agency could take to develop the financial plan.

TARGET AUDIENCE
The primary target audience for this training is anyone involved with developing the financial plan, including asset managers, program managers, financial officers and managers (revenue, budget, accounting, and audit), maintenance directors, planners, and their staff. While titles and roles vary from agency to agency, staff involved in developing a financial plan generally consist of engineers, planners, analysts, accountants, auditors, and data managers. The participants may include staff from one transportation agency or could include a blend of state and regional participants from metropolitan planning organizations (MPOs) or rural planning organizations. Secondary target audiences include chief executive officers from state departments of transportation (DOT) and their staff, operations directors, legislative liaisons, as well as local and regional transportation agencies.

TRAINING LEVEL: Basic

FEE: 2022: $400 Per Person; 2023: $400 Per Person

LENGTH: 1.5 DAYS (CEU: 1.1 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Introduction to Financial Planning for Transportation Asset Management

Introduction to Financial Planning for Transportation Asset Management (TAM) explores common terms, background information, and the context of financial plans for TAM. This engaging WBT builds a foundation of knowledge and helps you answer these questions:

1. What is a financial plan and what are the benefits of creating and using one?
2. What are the components of a financial plan?
3. Who are the essential stakeholders for developing a financial plan?
4. What factors influence the investment strategies for meeting condition targets?
5. How are the financial plans and other State plans, programs, and budgets related?

The 60-minute Web-based training is organized into three lessons. The lessons do not need to be completed at one sitting.

The course includes introductory material that can help anyone involved with developing the financial plan.

OUTCOMES

Upon completion of the course, participants will be able to:

- Describe the financial plan’s purpose and benefits.
- List the components of a financial plan.
- Identify stakeholders who are essential contributors to the development of a financial plan.
- Identify key factors that influence investment strategies for meeting condition targets.
- Explain the relationships between the financial plan and other state plans, programs, and budgets.

TARGET AUDIENCE

The primary audience for this course includes those involved with or interested in developing the financial plan, including asset management program managers, their staff in State transportation agencies, and staff members from metropolitan planning organizations (MPOs). These individuals include engineers, planners, and budgeting and finance personnel. State DOT Chief Executive Officers and their staff would benefit from the level of understanding provided in this Web-based training. This is an introductory-level course. There are no prerequisites.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
NHI Training Information: (877) 558-6873 • Fax (703) 235-0577

COURSE NUMBER
FHWA-NHI-136002V

COURSE TITLE
Financial Planning for Transportation Asset Management (Virtual Delivery of 136002)

Financial plans provide an excellent opportunity for agencies to demonstrate to constituents that they are responsibly managing their transportation assets. Get the information you need to develop or further develop your TAM Financial Plans!

The blended training approach to NHI 136002 Financial Planning for Transportation Asset Management (TAM) includes a brief (one-hour) Web-based training (WBT) component. The WBT builds foundational knowledge of financial planning in the context of TAM and reviews common vocabulary and background information.

Then, an instructor-led, web-based conference training event completes the blended approach. Over the course of 1.5 days, participants discover the key content areas of a financial plan and explore the approaches to developing one. A facilitator guides small working groups as they create a financial plan outline that includes each content area. The groups identify gaps that could reduce the plan’s effectiveness and identify the next steps their agency must take to fully develop the financial plan. The teams’ financial plan outlines are evaluated by the instructor. Participants leave the classroom with a useful work product that can be further developed and used in the agency’s financial planning process.

NHI-136002V-Financial Planning for Transportation Asset Management is now offered on-line as a virtual course. A virtual instructor-led training provides 100% remote learning while ensuring participants have access to expert instructors, workshop activities, and engaging peer-to-peer discussions. Sessions are typically held as half-day events over three days. Register today and learn to develop or further develop your TAM Financial Plans!

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe the financial plan’s purpose and benefits.

• Create an outline that identifies the components of the financial plan and describes for each component: the required content; key factors that influence the development; the stakeholders involved in the development of the component; and the roles and responsibilities of each stakeholder.

• Identify gaps in policies, data, and processes that need to be addressed by your agency to develop the financial plan, using the financial plan outline.

• Recommend the next steps the agency could take to develop the financial plan.

TARGET AUDIENCE
The primary target audience for this training is anyone involved with developing the financial plan, including asset managers, program managers, financial officers and managers (revenue, budget, accounting, and audit), maintenance directors, planners, and their staff. While titles and roles vary from agency to agency, staff involved in developing a financial plan generally consist of engineers, planners, analysts, accountants, auditors, and data managers. The participants may include staff from one transportation agency or could include a blend of state and regional participants from metropolitan planning organizations (MPOs) or rural planning organizations. Secondary target audiences include chief executive officers from state departments of transportation (DOT) and their staff, operations directors, legislative liaisons, as well as local and regional transportation agencies.

TRAINING LEVEL: Basic

FEE: 2022: $400 Per Person; 2023: $400 Per Person

LENGTH: 12 HOURS (CEU: 1.1 UNITS)

CLASS SIZE: MINIMUM: 10; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-136106A

COURSE TITLE
Introduction to Transportation Asset Management with Workshop

“An Introduction to Transportation Asset Management” was updated in Fall of 2017 to reflect the Asset Management Rule (23 CFR part 515) and includes a summary of specific provisions related to asset management. Whether your agency is focused on meeting current requirements or planning for future enhancements and implementation, this course can help you meet those challenges!

Stakeholders today demand transparency in the transportation agency’s decision process; meanwhile, the agency faces higher expectations for customer service with fewer available resources. Transportation asset management (TAM) is a strategic approach to managing physical transportation infrastructure. The TAM environment promotes effective use of funding and can provide a method for defending the need for additional resources because it uses reliable data and a clear set of expected performance metrics to guide investment decisions and identify required resources.

NHI 136106A is a 1.5-day course that covers the principles of TAM and introduces the core questions every agency should be able to answer about its assets. Join this class to participate in a series of workshops that help you apply asset management principles to real-life situations. You’ll also find an agency assessment tool that can be used to identify gaps between the desired and actual use of TAM principles. Other topics introduced in this course include: asset management principles; performance management; long-term financial planning; risk assessment; and implementation.

This course is a prerequisite for NHI 136106B “Development of a Transportation Asset Management Plan.” You may also be interested in NHI 136106C “Introduction to Transportation Asset Management Plans,” which is a Web-based training. See the NHI website for additional information on each of these courses.

OUTCOMES
Upon completion of the course, participants will be able to:

• Champion the use of asset management principles and concepts within the organization
• Define their role in supporting the agency’s asset management efforts
• Identify the strengths and weaknesses of your agency’s asset management program
• Identify strategies for advancing your agency’s use of asset management principles

TARGET AUDIENCE
This training is designed for senior-level and mid-level managers from State departments of transportation and other transportation agencies, who typically have the responsibility for decision-making in one or more areas addressed by transportation asset management. Participants should represent a number of organizational units, including (but not limited to) planning, engineering (e.g., facility management, design, construction), capital programming, maintenance and operations, financial management, traffic and safety engineering, system operation and management, and information technology. The course is also intended for individuals who manage or provide critical information to senior managers, or who have direct responsibility for meeting specific transportation system performance or program delivery targets.

TRAINING LEVEL: Basic

FEE: 2022: $500 Per Person; 2023: $500 Per Person

LENGTH: 1.5 DAYS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-136106B

COURSE TITLE
Developing a Transportation Asset Management Plan

“Developing a Transportation Asset Management Plan” was updated in Fall of 2017 to reflect the Asset Management Rule (23 CFR part 515) and incorporate recent FHWA guidance on risk management, life-cycle planning, and financial planning. Case studies and sample plans were updated in 2020.

The class combines a brief (1-hour) Web-based training prerequisite with a 1.5-day instructor-led session to introduce the role of the Transportation Asset Management Plan (TAMP) as a planning, communication, and accountability tool. You will encounter lessons focusing on three primary components to the TAMP, including strategic performance management, risk assessment, and financial management. The workshops throughout the course allow you to work through real-life examples and practice skills, such as setting strategies. You’ll find a variety of resources, tools, and guidelines for use in developing a TAMP.

This course is the second in a series of courses on transportation asset management. All participants registering for this course must have completed the prerequisite NHI 136106A An Introduction to Transportation Asset Management or have demonstrated a solid background in transportation asset management principles and planning. In any event, all participants must successfully complete the Web-based training 136106C. The Web-based training is available at no additional charge and can be accessed via the NHI website.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the role of a Transportation Asset Management Plan in a transportation agency.
• Identify strategies for incorporating risk into investment decisions.
• Explain how to determine whether an agency is making sustainable, long-term investments in its assets.
• Develop a Transportation Asset Management Plan that matches the amount of data and the sophistication of the analysis tools available.

TARGET AUDIENCE
The course is intended for senior-level and mid-level managers from State departments of transportation and other transportation agencies, who have the responsibility for decision-making in one or more areas addressed by transportation asset management. Course participants should represent a broad range of organizational units, such as (but not limited to) planning, engineering (facility management, design, and construction), capital programming, maintenance and operations, financial management, traffic and safety engineering, system operation and management, and information technology. If the agency has an Asset Management Steering Committee, its members would benefit from this course. In addition, individuals who manage individual assets or provide critical information to senior managers, or who have direct responsibility for meeting specific transportation system performance or program delivery targets, are also excellent candidates for attending the course.

TRAINING LEVEL: Intermediate

FEE: 2022: $500 Per Person; 2023: $500 Per Person
LENGTH: 1.5 DAYS (CEU: 1 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Introduction to a Transportation Asset Management Plan

This training is a prerequisite of another NHI training and is offered at no cost.

A Transportation Asset Management Plan (TAMP) can be considered a business plan that builds the case for making infrastructure investments and explains how resources will be used. This course, “Introduction to a Transportation Asset Management Plan,” is a 1-hour, Web-based training (WBT) that introduces the content and organization of a TAMP and the typical TAMP development process. This course was previously cataloged under 131106C.

This training includes the following topics:
- The use of a TAMP in transportation agencies
- The typical content of a TAMP (including a comparison with requirements in MAP-21)
- Key components, including performance projections and the financial summary
- Examples of TAMPs at various levels of maturity
- Existing and anticipated use of a TAMP in state highway agencies
- The expected involvement of agency personnel in developing and updating a TAMP

This training includes audio clips from leaders in state highway agencies that convey the anticipated benefits from the development of a TAMP and the way they expect to use their TAMP. In addition, the WBT highlights the use of existing documentation to develop the TAMP and plans for enhancing the content of future TAMPs.

This training serves as a prerequisite for NHI-136106B “Developing a Transportation Asset Management Plan”, which describes the role of a TAMP in a transportation agency and explores in some detail three important components: strategic performance management, risk assessment and management, and financial management.

OUTCOMES

Upon completion of the course, participants will be able to:
- Describe the role of a TAMP as a communication tool with internal and external stakeholders.
- List the typical content of a TAMP.
- Identify several sources of information that will contribute to the development of a TAMP.

TARGET AUDIENCE

The course is intended for senior-level and mid-level managers from State departments of transportation and other transportation agencies, who typically have the responsibility for decision-making in one or more areas addressed by transportation asset management. Participants should represent a number of organizational units, including (but not limited to) planning, engineering (e.g., facility management, design, construction), capital programming, maintenance and operations, financial management, traffic and safety engineering, system operation and management, and information technology. The course is also intended for individuals who manage or provide critical information to senior managers, or who have direct responsibility for meeting specific transportation system performance or program delivery targets.

TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-136106V

COURSE TITLE
Introduction to Transportation Asset Management with Workshop (Virtual Delivery of 136106A)

“An Introduction to Transportation Asset Management” was updated in Fall of 2017 to reflect the Asset Management Rule (23 CFR part 515) and includes a summary of specific provisions related to asset management. Whether your agency is focused on meeting current requirements or planning for future enhancements and implementation, this course can help you meet those challenges!

Stakeholders today demand transparency in the transportation agency’s decision process; meanwhile, the agency faces higher expectations for customer service with fewer available resources. Transportation asset management (TAM) is a strategic approach to managing physical transportation infrastructure. The TAM environment promotes effective use of funding and can provide a method for defending the need for additional resources because it uses reliable data and a clear set of expected performance metrics to guide investment decisions and identify required resources.

NHI 136106A is a 1.5-day course that covers the principles of TAM and introduces the core questions every agency should be able to answer about its assets. Join this class to participate in a series of workshops that help you apply asset management principles to real-life situations. You’ll also find an agency assessment tool that can be used to identify gaps between the desired and actual use of TAM principles. Other topics introduced in this course include: asset management principles; performance management; long-term financial planning; risk assessment; and implementation.

This course is a prerequisite for NHI 136106B “Development of a Transportation Asset Management Plan.” You may also be interested in NHI 136106C “Introduction to Transportation Asset Management Plans,” which is a Web-based training. See the NHI website for additional information on each of these courses.

NHI-136106A- Introduction to Transportation Asset Management with Workshop is now offered on-line as a virtual course. A virtual instructor-led training provides 100% remote learning while ensuring participants have access to expert instructors, workshop activities, and engaging peer-to-peer discussions. Sessions are typically held as half-day events over three days.

Register today to learn the principles of Transportation Asset Management in the convenience of your home and/or office anywhere in the country, remotely.

OUTCOMES
Upon completion of the course, participants will be able to:
• Champion the use of asset management principles and concepts within the organization.
• Define their role in supporting the agency’s asset management efforts
• Identify the strengths and weaknesses of your agency’s asset management program
• Identify strategies for advancing your agency’s use of asset management principles

TARGET AUDIENCE
This training is intended for senior-level and mid-level managers from State departments of transportation and other transportation agencies, who typically have the responsibility for decision-making in one or more areas addressed by transportation asset management. Participants should represent a number of organizational units, including (but not limited to) planning, engineering (e.g., facility management, design, construction), capital programming, maintenance and operations, financial management, traffic and safety engineering, system operation and management, and information technology. The course is also intended for individuals who manage or provide critical information to senior managers, or who have direct responsibility for meeting specific transportation system performance or program delivery targets.
TRAINING LEVEL: Basic

FEE: 2022: $500 Per Person; 2023: $500 Per Person

LENGTH: 12 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-136106W

Course Title
Developing a Transportation Asset Management Plan (Virtual Delivery of 136106B)

“Developing a Transportation Asset Management Plan” was updated in Fall of 2017 to reflect the Asset Management Rule (23 CFR part 515) and incorporate recent FHWA guidance on risk management, life-cycle planning, and financial planning. Case studies and samples plans were updated in 2020.

The class combines a brief (1-hour) Web-based training prerequisite with a 1.5-day online instructor-led session to introduce the role of the Transportation Asset Management Plan (TAMP) as a planning, communication, and accountability tool. You will encounter lessons focusing on three primary components to the TAMP, including strategic performance management, risk assessment, and financial management. The workshops throughout the course allow you to work through real-life examples and practice skills, such as setting strategies. You’ll find a variety of resources, tools, and guidelines for use in developing a TAMP.

This course is the second in a series of courses on transportation asset management. All participants registering for this course must have completed the prerequisite NHI-136106A or NHI-136106V - An Introduction to Transportation Asset Management or have demonstrated a solid background in transportation asset management principles and planning. In any event, all participants must successfully complete the Web-based training 136106C. The Web-based training is available at no additional charge and can be accessed via the NHI website.

Sessions are typically held as half-day events over three days. Register today to attend this course in the convenience of your home and/or office anywhere in the country, remotely.

Outcomes
Upon completion of the course, participants will be able to:
• Describe the role of a Transportation Asset Management Plan in a transportation agency.
• Identify strategies for incorporating risk into investment decisions.
• Explain how to determine whether an agency is making sustainable, long-term investments in its assets.
• Develop a Transportation Asset Management Plan that matches the amount of data and the sophistication of the analysis tools available.

Target Audience
The course is intended for senior-level and mid-level managers from State departments of transportation and other transportation agencies, who have the responsibility for decision-making in one or more areas addressed by transportation asset management. Course participants should represent a broad range of organizational units, such as (but not limited to) planning, engineering (facilities management, design, and construction), capital programming, maintenance and operations, financial management, traffic and safety engineering, system operation and management, and information technology. If the agency has an Asset Management Steering Committee, its members would benefit from this course. In addition, individuals who manage individual assets or provide critical information to senior managers, or who have direct responsibility for meeting specific transportation system performance or program delivery targets, are also excellent candidates for attending the course.

Training Level: Intermediate
Fee: 2022: $500 Per Person; 2023: $500 Per Person
Length: 12 Hours (CEU: 1 Units)
Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-136113

Course Title
Transportation Asset Management Overview

This training was developed by the Transportation Curriculum Coordination Council (TCCC) in partnership with AASHTO and NHI. This training explains the basics of asset management and why asset management is important. After you complete this training, you’ll have new terms, and new ways of thinking about what you’re already doing. More importantly, you’ll understand why it’s so important to be strategic and systematic when you’re responsible for managing huge numbers of assets.

This training contains the following lessons:

Lesson 1: What is Transportation Asset Management? This lesson will explain the concept of asset management; give examples of how asset management is used in the planning process; and explain how current asset management practices have been impacted by past transportation needs.

Lesson 2: Asset Management Principles and Practices. This lesson lists the categories of activity that inform spending decisions; explain how policy goals and objectives impact asset management; relate planning and programming to managing assets; describe how asset management principles apply to program delivery; explain why system monitoring is necessary; and explain how quality data and analysis impact asset management.

Outcomes
Upon completion of the course, participants will be able to:

- Explain what transportation asset management is and why it is important
- Describe the asset management principles and practices used to make informed spending decisions

Target Audience
This training was developed by the Transportation Curriculum Coordination Council (TCCC) in partnership with AASHTO, NHI, and is recommended for TCCC levels II through IV.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 2 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-138012

COURSE TITLE
Effective Target Setting for Transportation Performance Management

YOU CAN PREVIEW A SUMMARY OF THIS COURSE BY COPYING AND PASTING THE FOLLOWING URL: https://connectdot.connectsolutions.com/nhi138012executivesummary/

‘Effective Target Setting for Transportation Performance Management’ is a 2-day Instructor-led Training (ILT) course offered by NHI, the authoritative source in transportation training.

Transportation agencies have been moving toward a performance-based management approach for over a decade. The passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) Act further emphasized the importance of target setting within a performance management context. MAP-21 requires State Departments of Transportation (State DOTs), Metropolitan Planning Organizations (MPOs), and public transit providers to set performance targets for the United States Department of Transportation’s (USDOT’s) established national performance measures.

It is anticipated that performance management principles will carry forward in subsequent legislation as it has been shown to be good business practice and has been supported by the United States Government Accountability Office (GAO). While FHWA and most State DOTs and MPOs have experience with developing performance measures and reporting on condition/performance, experience is much more limited in setting performance targets and reporting on the achievement (or not) of those targets. Understanding and applying targets within a Transportation Performance Management (TPM) program is a critical component of TPM.

This course will provide the information needed on how to establish and use performance targets. The course will answer these broad questions: What is a target?, Why should I set targets?, How do I set targets?, How do I use targets? The focus of this training will be at the State/MPO level. Federal employees will learn about their role in the context of States/MPOs going through the target setting steps.

This course includes a written assessment. The course content was last updated in October 2017.

YOU CAN PREVIEW A SUMMARY OF THIS COURSE BY COPYING AND PASTING THE FOLLOWING URL: https://connectdot.connectsolutions.com/nhi138012executivesummary/

To enroll in this Instructor-led Training course, click the ‘View Sessions’ button and click ‘Add To Cart’ next to your session choice. If there are no upcoming sessions, click ‘Sign Up for Session Alerts.’

Any organization can host this course. To host this course and bring training to your organization, click the ‘Host this Course’ button.

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain the value of setting appropriate and effective targets as part of performance management and within the context of current legislation
• Describe what a target is and the importance of establishing a baseline
• Explain the importance of collaboration in the target setting process and in the context of current legislation
• Explain the key steps to set an effective target
• Explain the factors involved in setting targets
• Explain how trade-offs should be considered in determining targets between system performance areas
• Set a target
• Identify coordination needs in target setting
• Identify key stakeholder roles
• Identify key components of effective condition/performance tracking and progress assessment
• Identify strategies to communicate target data and information effectively
• Identify mitigation strategies for challenges related to target setting

TARGET AUDIENCE
The target audience for this Instructor-led Training course includes the following: + Technical roles responsible for setting targets  + Planning/programming staff who develop the Statewide Transportation Improvement Plan (STIP) and Regional Transportation Improvement Plans (RTIPs)  + Staff dedicated to performance management  + Individuals who will be involved in coordination/collaboration of target setting  + Federal Highway Administration/Division Office employees and FTA employees who provide oversight for and assistance with target setting, including Performance and Management Analysts (PMAs) and subject area specialists who will assist their state and local partners A secondary target audience for this training includes higher-level decision makers who will ultimately decide on which targets to use.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $500 Per Person; 2023: $500 Per Person

**LENGTH:** 2 DAYS (CEU: 1.2 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-137049

COURSE TITLE
ITS Procurement - WEB-BASED

This course is brought to you by the Intelligent Transportation Systems Joint Program Office's Professional Capacity Building Program (https://www.pcb.its.dot.gov/).

This course will provide an overview of strategies for successfully deploying ITS projects that build on systems engineering principles and practices. This course will present an approach to defining ITS projects and desired outcomes. The focus of this course is on the procurement stage of the overall acquisition process. For this course, the procurement stage spans from identifying what you need to developing a procurement that helps you get what you need through contractor selection. &#8232;

This course will provide you with tools to develop the key aspects of a request for quote (RFQ), request for proposal (RFP), invitation for bid (IFB), or goods contract advertisement to ensure a successful procurement.

OUTCOMES
Upon completion of the course, participants will be able to:
• Explain what it means to have a successful procurement.
• Accurately define what you need so that it can be clearly communicated.
• Select the ideal approach for a given procurement project.
• Match a selection method to an outcome.
• Complete an ITS procurement project.

TARGET AUDIENCE
Primary audience: Public agency ITS program and project managers, support staff, and consultants Public agency procurement/contract managers and support staff Federal field staff involved in ITS Secondary audience: Planners who will be assisting in interagency coordination/cooperation and ITS projects

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 3.5 HOURS (CEU: .3 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-137050

COURSE TITLE
ITS Awareness WBT

This course is brought to you by the Intelligent Transportation Systems Joint Program Office’s Professional Capacity Building Program (https://www.pcb.its.dot.gov/).

This course provides public and private sector practitioners with an introduction to current intelligent transportation systems (ITS). It presents an overview of the broader context in which individual ITS applications and service packages are developed, deployed, and operated. It also offers insights into the future directions in which ITS is expected to develop. This course will be of particular interest to Department of Transportation (DOT) staff seeking to introduce ITS to a wider number of staff, while also advancing the ITS expertise of select staff.

Lesson Topics include:
- Foundational Concepts of ITS
- ITS Service Areas and Service Packages
- Operational Environment
- Connected Vehicles (CV), Automated Vehicles (AV), and Connected and Automated Vehicles (CAV or C/AV)

This web-based course (WBT) offers an End-of-Course Assessment that qualifies you to receive Continuing Education Credits (CEUs).

OUTCOMES
Upon completion of the course, participants will be able to:
• Identify the capabilities, projects, technologies, and methods of ITS that enable it to be “intelligent” (or at least “integrated”)
• Determine how ITS fits into the overall framework of transportation and its impacts on the future of transportation
• List ways in which ITS affects the various users and stakeholders
• Identify the major areas of ITS in which transportation professionals work
• Describe how different areas of the United States are using ITS to operate their transportation systems safely and efficiently
• Describe how ITS elements share information using open standards to implement ITS capabilities across multiple modes and regions
• Identify future ITS technologies, especially with the future introduction of Connected and Automated Vehicles

TARGET AUDIENCE
Public and private sector practitioners with interest in new transportation directions, including increased information on CV, AV and Smart City activities.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 6 HOURS (CEU: .6 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-137051

Course Title
Systems Engineering Fundamentals for ITS

‘Systems Engineering Fundamentals’ is an 8-hour web-based training offered by NHI, the authoritative source in transportation training. This course is an introduction to systems engineering for ITS project managers and project staff. It provides a high-level view of a broad and rich topic area, introducing basic concepts to individuals who are working on ITS projects. The goal is to allow these individuals to understand the benefits of applying systems engineering approaches as a means of developing quality systems. The course covers technical practices such as modeling, prototyping, trade-off analysis and testing, and management practices such as risk assessment and mitigation, which make up “best practices” in the systems engineering arena.

To enroll in this web-based training course, select ‘Add ToCart.’

Outcomes
Upon completion of the course, participants will be able to:

• Define Systems Engineering and its application to ITS
• Describe the system’s life cycle and its relationship to systems engineering
• Develop, derive, and validate requirements for a system
• List the systems engineering tools available to mitigate risk
• Define and apply the concept of earned value as a tracking mechanism
• List three alternative strategies that may be applied to decision making under uncertainty
• Identify where to find appropriate standards for developing ITS projects
• Identify resources that may help project personnel to look at systems as a whole

Target Audience
TBD

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 8 HOURS (CEU: .8 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-137055

Course Title
Transportation Cyber Security

‘Transportation Cyber Security’ is a 4-hour long web-based training offered by NHI, the authoritative source in transportation training. The course is intended for professionals working with surface transportation systems. Each of the subject areas could be a course on its own, as the field is constantly changing and technologies evolve quickly under competitive pressure. This course is intended to help transportation professionals improve their understanding of the subject, and offer the tools that are useful for learning more about cyber security and resilience. Selected topics covered in this course are: hackers and their motivations, transportation objectives at risk, cyber technologies, common vulnerabilities associated with social media and public information systems, and tools for keeping informed about the developments in cybersecurity.

To enroll in this web-based training course, select ‘Add to Cart.’

Outcomes
Upon completion of the course, participants will be able to:
• Discuss the motivations of hackers and determine what transportation objectives are at risk
• Analyze the complex and rapidly changing technologies associated with the broad discipline of cyber security
• Explain common vulnerabilities associated with social media, public information systems, etc.
• Identify and explain what makes up the center-to-field network, discuss its common vulnerabilities and operational risks
• Explain the common vulnerabilities of the Traffic Management Center and identify some common solutions
• List the tools that are useful for learning more about cyber security and resilience

Target Audience
Transportation professionals working with surface transportation systems

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 4 HOURS (CEU: .4 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-137060

COURSE TITLE
Introduction to Connected Vehicles and Automated Vehicles

This course is brought to you by the Intelligent Transportation Systems Joint Program Office’s Professional Capacity Building Program (https://www.pcb.its.dot.gov/).

The goal of this course is to provide public and private sector practitioners with an understanding of the basics of connected vehicle and automated vehicle technology. This introductory course highlights the USDOT’s connected and automated vehicle research and efforts and the technologies’ benefits and implications. Participants will learn about the applications envisioned for the connected vehicle and automated vehicle environments.

The course consists of the following WBT topics:
Topic 1: What Are Connected Vehicles and Automated Vehicles?
Topic 2: Technologies and Applications for Connected Vehicles and Automated Vehicles
Topic 3: Research Toward Implementation
Topic 4: Testing and Piloting the Technologies
Topic 5: Resources for Deployment

This course was launched in --month-- 2019.

Some of the topics include videos and links to more resources.

This web-based course (WBT) offers an End-of-Course Assessment that qualifies you to receive Continuing Education Credits (CEUs).

To enroll in this WBT/WCT course, select the ‘View Sessions’ button and select ‘Add To Cart’ next to your session choice. If there are no upcoming sessions, select ‘Sign Up for Session Alerts.’

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the concept of connected vehicles
• Describe the concept of automated vehicles
• Identify the types of communications technologies that can be used for connected vehicles
• Describe how connectivity enhances automation
• Identify some of the applications for connected and automated vehicles
• Describe the pertinent USDOT research efforts related to connected vehicles
• Describe the pertinent USDOT research efforts related to automated vehicles
• Identify the resources available to learn more and get involved

TARGET AUDIENCE
The target audience for this WBT course includes transportation planners, managers, and engineers at state and local agency levels who are interested in learning about the basics of connected vehicles and automated vehicles, their benefits and implications, and the USDOT’s latest related research and activities.
TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 2 HOURS (CEU: .2 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-137070

Course Title
Improving Highway Safety with ITS

This is the PILOT session for the updated NHI-137070 course. If you are not registered for the pilot session, please return to the website in February 2023 for the launch of the new version of this course.

‘Improving Highway Safety with ITS’ is an 1.5 hours WBT course offered by NHI, the authoritative source in transportation training. This course is an introduction to ITS-based strategies and tools available for improving highway safety. This course is intended for ITS, transportation operations, and safety professionals, including, but not limited to, planners, operators, designers, emergency management, and maintenance personnel. This course is divided into five lessons, each intended to introduce or illustrate concepts relating to the development and deployment of ITS strategies to address safety issues.

To enroll in this web-based training course, select ‘Add to Cart.’

Outcomes
Upon completion of the course, participants will be able to:

- Explain the overall magnitude and importance of highway safety
- Recognize and discuss the contribution ITS can make in improving highway safety
- Identify applications in the connected vehicle program that are primarily safety related
- Describe the framework for considering ITS countermeasures within your safety planning process
- Exploit practical opportunities for collaboration among Safety and ITS personnel
- Employ several ITS and Safety resources

Target Audience
The target audience for this WBT course are safety professionals, including planners, operators, designers, emergency management, and maintenance personnel.

Training Level: Basic
Fee: 2022: $0 Per Person; 2023: $0 Per Person
Length: 1.5 HOURS (CEU: .1 UNITS)
Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-137072

Course Title
Weather Responsive Traffic Management (WRTM)

‘Weather Responsive Traffic Management (WRTM)’ is a 6-hour long web-based training offered by NHI, the authoritative source in transportation training. This course provides information and guidance to transportation system managers and operators to help them effectively manage traffic flow and operations during adverse weather conditions. Various WRTM strategies are described and case studies are presented to illustrate existing best practices. Specific guidance is provided on how to choose, design, and implement WRTM strategies that are appropriate for different roadway, traffic, and weather conditions. Training materials include information and tools for traffic modeling and analysis, types and sources of traffic and weather data needed to support WRTM strategies, guidance on integrating weather and traffic data in daily operations, and procedures for performance measurement and evaluation of WRTM strategies. At the end of this course, participants will be able to define the WRTM concepts and frameworks and to describe different strategies and types of data and analytical tools available for the management of traffic during adverse weather events.

To enroll in this web-based training course, select ‘Add to Cart.’

Outcomes
Upon completion of the course, participants will be able to:

• Identify and describe the range of strategies and tools offered by WRTM for effectively managing traffic operations during weather events
• Identify the benefits associated with WRTM and the situations that warrant its application
• Identify the traffic and weather data needed to support WRTM implementation, and how to obtain and use this data
• Discuss the approaches to evaluating the performance of WRTM strategies
• Describe how agencies can more proactively implement WRTM strategies as part of transportation systems management including capacity enhancement and demand management

Target Audience
Transportation systems managers and operators

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 6 HOURS (CEU: .6 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-137073

Course Title
Principles and Tools for Road Weather Management

‘Principles and Tools for Road Weather Management’ is a 6-hour long web-based training offered by NHI, the authoritative source in transportation training. This course provides transportation professionals in highway maintenance and/or highway operations with training to develop tools and strategies for addressing road weather problems. The course begins with an overview of the types of road weather problems and their associated costs, as well as basic meteorology for non-meteorologists. Through this course, participants are exposed to various strategies for addressing road weather problems, including Road Weather Information Systems (RWIS) and the development of crosscutting decision support systems to respond effectively to weather situations. In addition, road weather solutions unique to maintenance management, traffic management, traveler information, and emergency management are discussed.

To enroll in this web-based training course, select ‘Add to Cart.’

Outcomes

Upon completion of the course, participants will be able to:

• Recognize the crosscutting impacts that weather has upon roadway operations
• Identify the technical and institutional challenges of implementing road weather management strategies
• Explain the range of effective and open solutions to the various types of weather for various management practices, i.e., maintenance, traffic, emergency, and safety management
• Discuss the variety of operational tools and techniques available to the transportation community to deal with the impacts

Target Audience
Transportation professionals in highway maintenance and/or highway operations

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person
Length: 6 HOURS (CEU: .6 UNITS)
Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-137074

Course Title
Road Weather Information Systems (RWIS) Equipment and Operations

‘Road Weather Information Systems (RWIS) Equipment and Operations’ is a 4-hour long web-based training offered by NHI, the authoritative source in transportation training. Adverse weather is our common enemy in road maintenance, traffic, and emergency operations. Transportation agencies are aware of the operational and logistical challenges of such weather. Many agencies are fighting this age-old battle by implementing Road Weather Information Systems (RWIS). This requires that critical personnel be well-informed of the impacts and considerations of deploying RWIS. The goal of this course is to, not only discuss RWIS initiatives and considerations, but through workshops, exercises, and self-assessments, explore individual state and local deployment challenges which will leave participants with an action plan tailored for their specific needs.

To enroll in this web-based training course, select ‘Add to Cart.’

Outcomes
Upon completion of the course, participants will be able to:
• Discuss the value of regional and national RWIS Initiatives
• Explain how RWIS can benefit your region
• Identify and discuss key considerations when installing a RWIS
• Develop an action plan and identify the steps to successfully integrate a RWIS into your regional operations

Target Audience
Transportation professionals in highway maintenance and/or highway operations

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person
Length: 4 HOURS (CEU: .4 UNITS)
Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-130109B

COURSE TITLE
Performance-Based Management of Highway Bridges

The traditional approach to bridge management has focused on identifying the worst performing structures in the inventory and addressing their deficiencies before anything else. But as inventories expand and age and as budgets shrink, most agencies discover that even as they address the worst bridges in the inventory, other bridges that could have been saved through preservation activities slip into deficiency. Today, the public expects transportation agencies to adopt a performance-based management approach that will achieve the highest level of performance possible and make the most effective use of available funds. The Performance-based Management of Bridges course uses video-based testimonies from transportation professionals to illustrate the ways in which their agencies have used performance-based management to estimate the cost-effectiveness of decisions and assess risk.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe how a bridge management system supports a performance-based bridge program.
• Identify framework for a performance-based management business model;
• Describe the development of performance measures;
• Describe methods for determining cost-effectiveness of actions;
• Describe considerations when assessing risk; and
• Describe strategies for communicating and reporting highway bridge performance-based management actions and results to other agency stakeholders and the public

TARGET AUDIENCE
The target audience includes Federal, State, and local bridge program managers; bridge management engineers; bridge management practitioners; transportation planners; and project planning and programming personnel. Additionally, transportation performance management team members, transportation asset management team members, bridge preservation and maintenance engineers, the financial management team, bridge inspectors, and bridge designers may benefit from this training. All participants should have knowledge of basic bridge terminology.

TRAINING LEVEL: Basic

FEE: 2022: $50 Per Person; 2023: $0 Per Person
LENGTH: 4 HOURS (CEU: .4 UNITS)
CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Introduction to Performance Measurement

‘Introduction to Performance Measurement’ is a two-hour Web-based Training course offered by NHI, the authoritative source in transportation training.

This course is one in a series of introductory courses that fall within the subject area of Transportation Performance Management. Transportation Performance Management is a strategic approach that uses system information to make investment and policy decisions to achieve national performance goals. Performance Management helps inform decisions on the use of available resources, strengthens our accountability, and allows us to better understand and communicate what works and what does not work.

Performance measures help us see if targets and goals are being reached and give us clear information to communicate with decision-makers and stakeholders. In addition, performance measures help ensure program alignment with investments and customer expectations.

The training provides an overview of performance measures. It covers FHWA’s role in developing performance measures and the criteria for developing effective performance measures. It also discusses the importance of data in developing performance measures, tools available for collecting data, and considerations for data analysis. It also addresses how performance measurement information can be used.

The course includes the following five lessons:
+ Performance Measures Overview
+ FHWA and Performance Measures
+ Criteria for Developing Effective Performance Measures
+ Data, Tools, and Analysis
+ Using Performance Measurement Information

This course was created in May of 2013. It does not include an assessment.

To enroll in this Web-based Training course, select ‘Add To Cart.’

OUTCOMES
Upon completion of the course, participants will be able to:
• Explain why performance measures are important
• Explain the FHWA’s role in developing performance measures
• Describe the criteria an effective performance measure must meet
• Recognize the importance of data in developing performance measures
• Explain how performance measurement information is used

TARGET AUDIENCE
The target audience for this Web-based Training course includes all FHWA employees.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 2 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Transportation Performance Management Overview for the MAP-21 and FAST Acts

‘Transportation Performance Management Overview for the MAP-21 and FAST Acts’ is a Web-based training course offered by NHI, the authoritative source in transportation training.

This course presents an overview of the Transportation Performance Management (TPM) provisions of MAP-21 and FAST, describes the responsibilities that agencies at various levels (Federal, State, and MPO) have in delivering these requirements, and captures best practices in use today that can help agencies get started on meeting the requirements. It begins by introducing participants to the TPM provisions of MAP-21 and FAST—including national goals and performance measures and how they relate, target setting, incorporation into the planning and programming process, and accountability and transparency requirements.

The course provides a necessary introduction for participants who are impacted by the law’s provisions in their own agencies’ processes. Learners will understand how the provisions impact their existing processes, and will also be able to study the examples provided throughout the course. It also addresses how TPM provisions may impact individual performance areas, such as safety, pavement, bridge condition, traffic congestion, etc. These impacts will be explained in more detail in subsequent courses on the specific performance areas.

The course includes the following specific topic modules:

+ TPM in MAP-21 and FAST
+ Measures and Targets
+ How Federal Planning and Programming Support TPM
+ Accountability and Transparency

This course was published in May of 2018.

Outcomes

Upon completion of the course, participants will be able to:

• Identify the transportation performance management provisions of MAP-21/FAST, how they are tied together, and the associated products and delivery timelines

• Describe the roles and responsibilities different agencies (Federal, State and MPO) have in implementing the MAP-21/FAST TPM provisions

• Describe noteworthy practices in use at other agencies that may be helpful to begin the process of implementing MAP-21/FAST TPM provisions

Target Audience

The target audience for this Web-based course primarily consists of FHWA, State DOT, and MPO staff who have a role in meeting the MAP-21/FAST TPM requirements. Regional planning organization (RPO), transit agency, other local agency staff, along with executives and senior decision makers, make up a secondary audience.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 1.5 Hours (CEU: .2 Units)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Performance-based Planning and Programming

‘Performance-based Planning and Programming’ is a two-day Instructor-led Training course offered by NHI, the authoritative source in transportation training.

As recent economic, political, and social trends have placed greater emphasis on public sector accountability and cost-effectiveness, many transportation agencies across the country have begun to shift towards a performance-based approach to plan, manage, and operate their systems. This course will familiarize transportation agencies with the key elements of a performance-based planning and programming (PBPP) framework, the relationship of these elements within existing planning and programming processes, and the connection of these elements to Transportation Performance Management (TPM) requirements initiated by legislation, including the Moving Ahead for Progress in the 21st Century (MAP-21) Act and continued under the Fixing America’s Surface Transportation (FAST) Act and the Statewide and Nonmetropolitan Transportation Planning; Metropolitan Transportation Planning Final Rule, which was published in the Federal Register on May 27, 2016.

This course begins by providing an overview of PBPP and then walks the participants through each element of the US Department of Transportation (USDOT) PBPP framework, providing examples of alternative approaches and real-world applications.

Participants in the course will gain insight on several key learning points, including:
+ How to apply performance management principles within the planning and programming process to achieve desired agency goals and performance outcomes
+ How to connect PBPP with other performance management activities, plans, and products
+ How to assess and learn from transferable planning and programming practices in use across the US, including examples of how agencies are moving towards implementing PBPP

This course includes a written assessment. The course content was last updated in July 2017.

Upon completion of the course, participants will be able to:
- Describe requirements for performance-based planning and programming.
- Describe the elements of the performance-based planning and programming framework.
- Describe how the performance-based planning and programming framework relates to the TPM requirements.
- Describe opportunities to engage the public in a performance-based planning and programming process.
- Explain how to integrate various performance-based plans using data and information contained within those plans.
- Recognize the role of coordination in developing performance-based plans.

The target audience for this Instructor-led Training course primarily includes transportation professionals responsible for developing and implementing performance-based plans and programs, and those responsible for integration and linkage of other requirements, under performance-based legislation initiated by MAP-21 and continued under FAST. This includes a broad audience of State DOTs, MPOs, regional planning organizations (RPOs), transit agencies, and USDOT staff. Participants should have knowledge of the planning process.
TRAINING LEVEL: Basic

FEE: 2022: $500 Per Person; 2023: $500 Per Person

LENGTH: 2 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-138008

Course Title
Transportation Performance Management (TPM) for Bridges

Starting in 2019, this course will be delivered for free to Metropolitan Planning Organizations and State DOTs. The reduced price is being provided by the FHWA Office of Infrastructure. YOU CAN PREVIEW A SUMMARY OF THIS COURSE BY COPYING AND PASTING THE FOLLOWING URL: https://connectdot.connectsolutions.com/nhi138008executivesummary/

‘Transportation Performance Management for Bridges’ is a one-day Instructor-led Training course offered by NHI, the authoritative source in transportation training.

Moving Ahead for Progress in the 21st Century Act (MAP-21) established, and Fixing America’s Surface Transportation (FAST) continued, new requirements for reporting on national performance measures and making progress toward targets in several national goal areas, including the condition of the bridges on the National Highway System (NHS). This course helps agencies apply Transportation Performance Management (TPM) concepts to implement the bridge-related TPM requirements.

The course begins with an overview of key performance management concepts. It then reviews performance measures defined for assessing and reporting bridge performance. Finally, the course details how to set and report bridge performance targets and assess performance against agency targets.

The main goals of the course are to provide agency staff with the skills and abilities to use the national bridge performance management measures to assess bridge condition, establish bridge performance targets, report bridge performance, and assess progress toward achieving bridge performance targets in compliance with the TPM requirements in 23 CFR 490.

The course is organized in the following lessons:
+ TPM Overview
+ Bridge Performance Management and Related Rules
+ Bridge Performance Data
+ Setting Bridge Performance Targets
+ Reporting, Accountability, and Transparency

The course includes a written assessment. The course was launched in May 2018.

YOU CAN PREVIEW A SUMMARY OF THIS COURSE BY COPYING AND PASTING THE FOLLOWING URL: https://connectdot.connectsolutions.com/nhi138008executivesummary/

To enroll in this Instructor-led Training course, select the ‘View Sessions’ button and select ‘Add To Cart’ next to your session choice. If there are no upcoming sessions, select ‘Sign Up for Session Alerts.’

Any organization can host this course. To host this course and bring training to your organization, click the ‘Host this Course’ button.

Outcomes
Upon completion of the course, participants will be able to:
• Describe the transportation performance management (TPM) requirements related to bridge performance
• Describe the performance-based planning and programming process and asset management process as they apply to bridges
• Identify required bridge performance measures, as well as other common bridge performance measures
• Use and interpret bridge performance data
• Identify key supporting business practices for establishing and assessing progress toward achieving targets
• Establish bridge performance targets using data on existing performance and predicted future funds, deterioration, and investment strategies
• Explain common challenges in establishing bridge performance targets and approaches that can be used to address them
• Describe required process for bridge performance measurement, reporting, and assessment
TARGET AUDIENCE

The target audience for this Instructor-led Training course consists primarily of professionals responsible for collecting, analyzing, and reporting bridge performance data; managing bridge inventories; recommending bridge investment strategies; and setting bridge performance targets. This audience includes bridge managers, asset managers, planners, performance management, and programming staff of State and local agencies, consultants, and FHWA.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 DAYS (CEU: .6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
**Course Number**  
FHWA-NHI-138011

**Course Title**  
The Role of Data in Transportation Performance Management

**Outcomes**  
Upon completion of the course, participants will be able to:

- Discuss the purpose and benefits of accurate and current relevant data in TPM activities
- Describe TPM data analysis needs for system performance areas
- Explain the elements of TPM and related business practices and the data that supports them
- List data requirements related to use of performance projections for target setting
- Identify common data quality issues and techniques for addressing them
- Identify existing gaps in data quality, availability, linkage, and analysis tools that impact the ability to meet federally legislated requirements, as well as support broader agency performance management processes
- Develop a data management and improvement plan

**Target Audience**  
The target audience for this Instructor-led Training course primarily includes staff at FHWA, State DOTs, MPOs, and national organizations, such as Association of Metropolitan Planning Organizations (AMPO) and American Association of State Highway and Transportation Officials (AASHTO) who would benefit from an overview of data management in the context of TPM applications and an appreciation for some basic data management concepts. The course is appropriate for the following types of roles: + Mid-level managers with TPM-related responsibilities + Pavement, bridge, safety, road inventory, traffic data managers, and analysts + Information technology staff that build reports or develop applications that support TPM business needs + Senior agency managers who have a strong interest in improving data at their organizations + Entry-level data managers and analysts who will be supporting agency TPM practicesNote: As an overview course, this course is not intended for seasoned transportation data professionals or those seeking an in-depth coverage of data needs and uses within any single performance area. It does not cover technical skill development in...
database design, query methods, data integration, or data analysis.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $400 Per Person; 2023: $400 Per Person

**LENGTH:** 2 DAYS (CEU: 1.2 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-138011

COURSE TITLE
The Role of Data in Transportation Performance Management

YOU CAN PREVIEW A SUMMARY OF THIS COURSE BY COPYING AND PASTING THE FOLLOWING URL: https://connect.dot.connectsolutions.com/nhi138011executivesummary/

‘The Role of Data in Transportation Performance Management’ is a two-day Instructor-led Training (ILT) course offered by NHI, the authoritative source in transportation training. Its goal is to enable participants to manage, analyze, integrate, and use data from diverse sources to support an effective agency Transportation Performance Management (TPM) function.

As transportation management agencies are preparing for federally legislated performance management requirements, many want to improve their data programs to support desired results. This course will help agencies improve management and use of data to meet the TPM requirements of 23 CFR 490 and the related Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America’s Surface Transportation Act (FAST).

The course begins with an overview of data management. It then details each part of the data supply chain, covering common needs, considerations, and challenges along the way. The course also covers issues related to data assessment and data improvement planning. The course material is synthesized at the end of the course through a group exercise in which participants create a data management and improvement plan.

This training can provide a useful starting point for agencies that wish to undertake improvements at all stages of the data life cycle.

The course includes a written assessment. The course content was last updated December 2017.

YOU CAN PREVIEW A SUMMARY OF THIS COURSE BY COPYING AND PASTING THE FOLLOWING URL: https://connect.dot.connectsolutions.com/nhi138011executivesummary/

To enroll in this Instructor-led Training course, click the ‘View Sessions’ button and click ‘Add To Cart’ next to your session choice. If there are no upcoming sessions, click ‘Sign Up for Session Alerts’.

Any organization can host this course. To host this course and bring training to your organization, click the ‘Host this Course’ button.

OUTCOMES
Upon completion of the course, participants will be able to:

• Discuss the purpose and benefits of accurate and current relevant data in TPM activities
• Describe TPM data analysis needs for system performance areas
• Explain the elements of TPM and related business practices and the data that supports them
• List data requirements related to use of performance projections for target setting
• Identify common data quality issues and techniques for addressing them
• Identify existing gaps in data quality, availability, linkage, and analysis tools that impact the ability to meet federally legislated requirements, as well as support broader agency performance management processes
• Develop a data management and improvement plan

TARGET AUDIENCE
The target audience for this Instructor-led Training course primarily includes staff at FHWA, State DOTs, MPOs, and national organizations, such as Association of Metropolitan Planning Organizations (AMPO) and American Association of State Highway and Transportation Officials (AASHTO) who would benefit from an overview of data management in the context of TPM applications and an appreciation for some basic data management concepts. The course is appropriate for the following types of roles: + Mid-level managers with TPM-related responsibilities + Pavement, bridge, safety, road inventory, traffic data managers, and analysts + Information technology staff that build reports or develop applications that support TPM business needs + Senior agency managers who have a strong interest in improving data at their organizations + Entry-level data managers and analysts who will be supporting agency TPM practices

Note: As an overview course, this course is not intended for seasoned transportation data professionals or those seeking an in-depth coverage of data needs and uses within any single performance area. It does not cover technical skill development in
database design, query methods, data integration, or data analysis.

**Training Level:** Basic

**Fee:** 2022: $400 Per Person; 2023: $400 Per Person

**Length:** 2 Days (CEU: 1.2 Units)

**Class Size:** Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-138012

Course Title
Effective Target Setting for Transportation Performance Management

YOU CAN PREVIEW A SUMMARY OF THIS COURSE BY COPYING AND PASTING THE FOLLOWING URL: https://connectdot.connectsolutions.com/nhi138012executivesummary/

‘Effective Target Setting for Transportation Performance Management’ is a 2-day Instructor-led Training (ILT) course offered by NHI, the authoritative source in transportation training.

Transportation agencies have been moving toward a performance-based management approach for over a decade. The passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) Act further emphasized the importance of target setting within a performance management context. MAP-21 requires State Departments of Transportation (State DOTs), Metropolitan Planning Organizations (MPOs), and public transit providers to set performance targets for the United States Department of Transportation’s (USDOT’s) established national performance measures.

It is anticipated that performance management principles will carry forward in subsequent legislation as it has been shown to be good business practice and has been supported by the United States Government Accountability Office (GAO). While FHWA and most State DOTs and MPOs have experience with developing performance measures and reporting on condition/performance, experience is much more limited in setting performance targets and reporting on the achievement (or not) of those targets. Understanding and applying targets within a Transportation Performance Management (TPM) program is a critical component of TPM.

This course will provide the information needed on how to establish and use performance targets. The course will answer these broad questions: What is a target?, Why should I set targets?, How do I set targets?, How do I use targets? The focus of this training will be at the State/MPO level. Federal employees will learn about their role in the context of States/MPOs going through the target setting steps.

This course includes a written assessment. The course content was last updated in October 2017.

YOU CAN PREVIEW A SUMMARY OF THIS COURSE BY COPYING AND PASTING THE FOLLOWING URL:
https://connectdot.connectsolutions.com/nhi138012executivesummary/

To enroll in this Instructor-led Training course, click the ‘View Sessions’ button and click ‘Add To Cart’ next to your session choice. If there are no upcoming sessions, click ‘Sign Up for Session Alerts.’

Any organization can host this course. To host this course and bring training to your organization, click the ‘Host this Course’ button.

Outcomes

Upon completion of the course, participants will be able to:
• Explain the value of setting appropriate and effective targets as part of performance management and within the context of current legislation
• Describe what a target is and the importance of establishing a baseline
• Explain the importance of collaboration in the target setting process and in the context of current legislation
• Explain the key steps to set an effective target
• Explain the factors involved in setting targets
• Explain how trade-offs should be considered in determining targets between system performance areas
• Set a target
• Identify coordination needs in target setting
• Identify key stakeholder roles
• Identify key components of effective condition/performance tracking and progress assessment
• Identify strategies to communicate target data and information effectively
• Identify mitigation strategies for challenges related to target setting

Target Audience
The target audience for this Instructor-led Training course includes the following:

+ Technical roles responsible for setting targets
+ Planning/programming staff who develop the Statewide Transportation Improvement Plan (STIP) and Regional Transportation Improvement Plans (RTIPs)
+ Staff dedicated to performance management
+ Individuals who will be involved in coordination/collaboration of target setting
+ Federal Highway Administration/Division Office employees and FTA employees who provide oversight for and assistance with target setting, including Performance and Management Analysts (PMAs) and subject area specialists who will assist their state and local partners

A secondary target audience for this training includes higher-level decision makers who will ultimately decide on which targets to use.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $500 Per Person; 2023: $500 Per Person

**LENGTH:** 2 DAYS (CEU: 1.2 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Effective Target Setting for Transportation Performance Management

‘Effective Target Setting for Transportation Performance Management’ is a 6.5-hour Web-based Training (WBT) course offered by NHI, the authoritative source in transportation training.

Transportation agencies have been moving toward a performance-based management approach for over a decade. The passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) Act further emphasized the importance of target setting within a performance management context. MAP-21 requires State Departments of Transportation (State DOTs), Metropolitan Planning Organizations (MPOs), and public transit providers to set performance targets for the United States Department of Transportation’s (USDOT's) established national performance measures.

It is anticipated that performance management principles will carry forward in subsequent legislation as it has been shown to be good business practice and has been supported by the United States Government Accountability Office (GAO). While FHWA and most State DOTs and MPOs have experience with developing performance measures and reporting on condition/performance, experience is much more limited in setting performance targets and reporting on the achievement (or not) of those targets. Understanding and applying targets within a Transportation Performance Management (TPM) program is a critical component of TPM.

The course supports the larger objective of helping State DOTs and MPOs understand how to implement performance management principles by teaching how to develop and set performance targets that will support progress toward an agency's strategic goals. This course answers the question, “How do I set targets?” by providing an in-depth review of the steps necessary.

The course strikes a careful balance with providing information on setting targets that can be applied to a range of performance areas without getting into the details of specific methodologies that are required by MAP-21. It contains short, focused lessons that reinforce content so that it can be directly applied by the learner.

The course includes an assessment. The course was launched in summer of 2018.

To enroll in this Web-based Training course, click ‘Add To Cart.’

OUTCOMES

Upon completion of the course, participants will be able to:

• Describe the existing practices and systems at an agency or organization that are essential to target setting
• List the basic steps involved in setting a target
• Explain how a target's purpose and parameters can be defined
• Describe the information needed to set a target
• Identify the factors that influence target setting
• Explain how a target is actually established
• Describe the process for tracking a target's progress
• List methods for reporting and communicating target information to internal and external stakeholders
• Describe how target setting fits into the performance-based planning and programming process and influences project selection and prioritization
• Identify requirements that impact target setting practices and processes

TARGET AUDIENCE

The target audience for this Web-based Training course includes the following: + Technical roles responsible for setting targets + Planning/programming staff who develop the Statewide Transportation Improvement Program (STIP) and regional Transportation Improvement Programs (TIPs) + Staff dedicated to performance management + Individuals who will be involved in coordination/collaboration of target setting + Federal Highway Administration/Division Office employees and FTA employees who provide oversight for and assistance with target setting, including Performance and Management Analysts (PMAs) and subject area specialists who will assist their state and local partners + Higher-level decision makers who will ultimately decide on which targets to use
Training Level: Intermediate

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 6.5 Hours (CEU: .7 Units)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-138014

COURSE TITLE
Getting Started on Effective TPM for Pavements

‘Getting Started on Effective TPM for Pavements’ is a one-hour web-based training course offered by NHI, the authoritative source in transportation training.

The passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America’s Surface Transportation (FAST) Act ushered in a range of new provisions for the Federal-aid highway program related to transportation performance management and highway infrastructure. State Departments of Transportation (DOTs), metropolitan planning organizations (MPOs), FHWA Division Offices, and other stakeholders need information about new requirements, as well as noteworthy practices.

This WBT course provides an effective, time-efficient, and accessible format for practitioners in State DOTs, MPOs, FHWA, and other groups. This format provides a richer context for information than static materials through the use of knowledge checks and other interactive features.

The goal of this course is to provide individuals with a foundational knowledge of the new legislation and regulatory requirements related to pavement condition performance. This foundation will give participants the tools and skills needed to begin helping their DOT and/or MPO meet the new requirements.

The course is organized into the following lessons:
+ Welcome and Overview
+ Performance Measures
+ Data
+ Calculating the Measure
+ Target Setting
+ Minimum Condition Requirements
+ Reporting
+ Coordination and Collaboration
+ Timeline

This course was launched in February 2019.

To enroll in this Web-based Training course, select ‘Add To Cart.’

OUTCOMES

Upon completion of the course, participants will be able to:
• Identify how TPM can benefit your State DOT or MPO
• Identify the performance measures established for pavement conditions
• Identify the data that is required for metric calculation
• Identify the importance of submitting complete and quality data
• Identify the key aspects of an effective data quality management plan
• Given metric ratings for pavement, calculate the percentage of lane miles in good condition
• Given metric ratings for pavement, calculate the percentage of lane miles in poor condition
• Identify target setting requirements and considerations associated with TPM for pavements
• Identify the minimum condition requirements for pavement
• Identify the different reports and requirements associated with TPM for pavements
• Identify the importance of collaboration to meet the pavement regulatory requirements
• Identify important deadlines associated with the pavement regulatory requirements
TARGET AUDIENCE

The target audience for this web-based training course includes State DOT and MPO staff responsible for pavement management, performance management, and asset management; State DOT and local government staff responsible for Highway Performance Monitoring System (HPMS) reporting who compile pavement data; and State DOT and MPO staff responsible for preparing proposals and calculating impacts for decision makers and target setters.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-138015

Course Title
Getting Started on Effective TPM for Bridges

‘Getting Started on Effective TPM for Bridges’ is a one-hour web-based training course offered by NHI, the authoritative source in transportation training.

The passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America’s Surface Transportation (FAST) Act ushered in a range of new provisions for the Federal-aid highway program related to transportation performance management and highway infrastructure. State Departments of Transportation (DOTs), metropolitan planning organizations (MPOs), FHWA Division Offices, and other stakeholders need information about new requirements, as well as noteworthy practices.

This WBT course provides an effective, time-efficient, and accessible format for practitioners in State DOTs, MPOs, FHWA, and other groups. This format provides a richer context for information than static materials, through the use of knowledge checks and other interactive features.

The goal of this course is to give learners an introduction to the new legislation and regulatory requirements related to bridge condition performance. It will help them build a working knowledge of the actions necessary to meet these requirements. This goal will give participants the skills needed to comply with regulation requirements, including data needs, metric calculations, reporting, target setting, collaboration with partners, and making significant progress relative to their state’s identified performance needs.

The module is organized into the following lessons:

+ Welcome and Overview
+ Performance Measures
+ Data
+ Calculating the Measure
+ Target Setting
+ Minimum Condition Requirements
+ Reporting
+ Coordination and Collaboration
+ Timeline

This course was launched in February 2019.

To enroll in this Web-based Training course, select ‘Add To Cart.’

Outcomes

Upon completion of the course, participants will be able to:

• Identify how TPM can benefit your State DOT or MPO
• Identify the performance measures established for bridge conditions
• Identify the data that is required for metric calculation
• Identify the importance of submitting complete and quality data
• Given metric ratings for bridges, calculate the percentage of deck area in good condition
• Given metric ratings for bridges, calculate the percentage of deck area in poor condition
• Identify target setting requirements and considerations associated with TPM for bridges
• Identify the minimum condition requirements for bridges
• Identify the different reports and requirements associated with TPM for bridges
• Recognize the role of collaboration in reaching the common goal of achieving a state of good repair
• Identify important deadlines associated with the bridge regulatory requirements
**TARGET AUDIENCE**

The target audience for this WBT course includes State Department of Transportation (DOT) and Metropolitan Planning Organization (MPO) staff responsible for bridge management who are new to Federal performance measure requirements, target setting, and reporting. It also includes experienced staff looking to refresh their knowledge.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $0 Per Person; 2023: $0 Per Person

**LENGTH:** 1 HOURS (CEU: 0 UNITS)

**CLASS SIZE:** MINIMUM: 0; MAXIMUM: 0

**NHI Customer Service:** (877) 558-6873  •  nhicustomerservice@dot.gov
Implementing Performance-Based Planning and Programming

Implementing Performance-Based Planning and Programming is a one-hour web-based training course offered by NHI, the authoritative source in transportation training.

The passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America’s Surface Transportation (FAST) Act ushered in a range of new provisions for the Federal-aid highway program related to transportation performance management and highway infrastructure. With associated rulemakings at completion or going through final administration review, State Departments of Transportation (DOTs), metropolitan planning organizations (MPOs), FHWA Division Offices, and other stakeholders are looking for and need information to learn about new requirements, as well as noteworthy practices.

This web-based course provides an effective, time efficient, and accessible format for practitioners in State DOTs, MPOs, FHWA, and other groups to learn more about the lesson topics noted below. This format provides a richer context for information than static materials, through the use of knowledge checks and other interactive features.

The goal of this web-based course is to provide learners with an introductory overview of the key elements and requirements of transportation performance management (TPM) and the performance-based planning and programming (PBPP) framework. The course will give participants the information and resources necessary to begin understanding PBPP to implement it effectively.

The module is organized into the following lessons:
- Welcome and Overview
- Strategic Direction
- Analysis - Part I
- Analysis - Part II
- Programming
- Implementation and Evaluation
- Collaboration and Coordination

This course was launched in May of 2019.

To enroll in this Web-based Training course, select ‘Add To Cart.’

OUTCOMES

Upon completion of the course, participants will be able to:
- Identify why TPM and PBPP requirements were created and how they are connected
- Recognize the importance of setting a strategic direction in the PBPP framework
- Identify how to align statewide goals and objectives with national goals and performance measures with goals and objectives
- Recognize what factors to consider while setting strategic direction
- Identify how and when to set targets based on goals and measures using the planning analysis process
- Identify how to prioritize transportation investments to meet targets using the planning analysis process
- Identify how to prioritize program-level projects in the TIP and STIP using the PBPP framework
- Identify effective methods for monitoring and evaluating system performance
- Identify performance reporting requirements
- Identify effective methods for coordinating and collaborating across State DOTs, MPOs, and public transit

TARGET AUDIENCE

The target audience for this web-based training course includes State Department of Transportation (DOT) leadership and planning staff—particularly state DOT staff who work on related topics (e.g., performance measures, LRTPs, TAMPs,
freight plans, STIPs) or are new to these topics; Metropolitan Planning Organization (MPO) boards and staff responsible for Metropolitan Transportation Plan and Transportation Improvement Program (TIP) preparation; new hires and junior-level employees at State DOTs and MPOs who may be unfamiliar with planning requirements and PBPP; FHWA Divisions Office staff; consultants working with transportation agencies; and public transit staff.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $0 Per Person; 2023: $0 Per Person

**LENGTH:** 1 HOURS (CEU: 0 UNITS)

**CLASS SIZE:** MINIMUM: 0; MAXIMUM: 0

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Introduction to Highway Performance Monitoring System (HPMS)

‘Introduction to Highway Performance Monitoring System (HPMS)’ is a one-hour Web-based training (WBT) course offered by NHI, the authoritative source in transportation training.

The passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America’s Surface Transportation (FAST) Act ushered in a range of new provisions for the Federal-aid highway program related to transportation performance management and highway infrastructure. In response to associated rulemakings, State Departments of Transportation (DOTs), metropolitan planning organizations (MPOs), FHWA Division Offices, and other stakeholders need information to learn about requirements, as well as noteworthy practices.

The goal of this course is to introduce learners to the HPMS program, its purpose and uses, and how HPMS relates to their jobs. It will help learners understand the history of HPMS, the HPMS data model, data that must be collected and reported, and submission requirements. The course will provide participants with the introductory knowledge needed to ensure their State DOT is complying with HPMS requirements.

This course was launched in August of 2019.

The course includes an end-of-course assessment.

To enroll in this Web-based Training course, select ‘Add To Cart.’

OUTCOMES

Upon completion of the course, participants will be able to:

- Identify why the HPMS program was created
- Identify the datasets States are responsible for in the HPMS Data Model
- Recognize the importance of submitting data according to requirements
- Identify how data is used after it is submitted
- Identify key dates for submittal and dataset lockdown
- Identify general reporting requirements that all States must follow
- Identify the steps involved in the HPMS workflow
- Recognize what is required during the post-submittal process

TARGET AUDIENCE

The target audience for this Web-based training course includes State Department of Transportation (DOT) HPMS coordinators and staff that collaborate within their respective agencies (from other offices, divisions, etc.) for HPMS purposes; HPMS Program managers and leadership; performance analysts including, but not limited to, traffic engineers, pavement engineers, GIS analysts, and roadway inventory management analysts; junior-level State DOT employees or employees unfamiliar with HPMS; and State DOT consultants.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Getting Started on Effective TPM for Freight

Getting Started on Effective TPM for Freight is a one-hour Web-based training (WBT) course offered by NHI, the authoritative source in transportation training.

The passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America’s Surface Transportation (FAST) Act ushered in a range of new provisions for the Federal-aid highway program related to transportation performance management and highway infrastructure. State Departments of Transportation (DOTs), metropolitan planning organizations (MPOs), FHWA Division Offices, and other stakeholders are seeking information about requirements, as well as noteworthy practices.

This course provides an effective, time efficient, and accessible format for practitioners in State DOTs, MPOs, FHWA, and other groups. This format provides a richer context for information than static materials through the use of knowledge checks and other interactive features.

The goal of this course is to provide individuals with a foundational knowledge of legislation and regulatory requirements related to freight bottlenecks and reliability. This foundation will give participants the skills needed to begin helping their DOT and/or MPO meet the new requirements.

The course is organized into the following lessons:
- Welcome and Overview
- Performance Measures
- Data
- Calculating the Measure
- Target Establishment
- Truck Freight Bottlenecks
- Reporting and Timeline
- Working with the Private Sector
- Wrap-Up

This course was launched in August of 2019.

The course includes an end-of-course assessment.

To enroll in this Web-based Training course, select ‘Add To Cart.’

OUTCOMES

Upon completion of the course, participants will be able to:
- Identify how TPM can benefit your State DOT or MPO
- Identify the performance measure established for Freight Reliability and the data required for metric calculation
- Calculate the Total Annual Truck Delay and the Truck Travel Time Reliability Index
- Identify requirements associated with establishing targets for freight and considerations associated with tracking travel time reliability
- Describe potential approaches for setting targets for freight
- Identify the importance of coordination and collaboration to establish targets and meet the freight regulatory requirements
- Describe best practices for agencies to collaborate to improve freight performance
- Identify the TPM requirements for, and outline methods to classify, truck freight bottlenecks
- Identify tools to determine bottleneck root causes
- Identify the different reports, requirements, and important deadlines associated with TPM for freight

TARGET AUDIENCE
The target audience for this Web-based training course includes freight planners or TPM practitioners at State DOTs and MPOs who are charged with TPM implementation and preparation of regular baseline and progress TPM reports. The course is also relevant for planners preparing or updating their freight plan and/or calculating the Truck Travel Time Reliability performance measure.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $0 Per Person; 2023: $0 Per Person

**LENGTH:** 1 HOURS (CEU: 0 UNITS)

**CLASS SIZE:** MINIMUM: 0; MAXIMUM: 0

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-138019

Course Title
Transportation Performance Management for Congestion including Freight, Self-Study

This course is the WBT-only version of a previous course (138010) that included a live webconference session with instructors. This course does not include the live feature.

‘Transportation Performance Management for Congestion including Freight, Self-Study’ is a six-hour web-based training course offered by NHI.

In many locations around the country, transportation agencies are tasked with the mandate to improve system performance, while struggling with limited budgets and resources. The Moving Ahead for Progress in the 21st Century (MAP-21) established a new performance-based Federal-aid program that was continued under the Fixing America’s Surface Transportation Act (FAST). The new program required State Departments of Transportation (State DOTs) and Metropolitan Planning Organizations (MPOs) to “assess the performance of the Interstate and non-Interstate National Highway System (NHS) for the purpose of carrying out the National Highway Performance Program (NHPP); to assess freight movement on the Interstate System; and to assess traffic congestion and on-road mobile source emissions for the purpose of carrying out the Congestion Mitigation and Air Quality Improvement (CMAQ) Program”.

The goal of this course is to provide the target audience with the skills and abilities to compile and analyze highway system performance data, calculate highway system performance measures, establish highway system performance targets, report highway system performance, and assess progress toward achieving performance targets.

The course consists of the following WBT modules:
Module 1: Highway System Performance Management Overview
Module 2: Performance-Based Planning and Programming
Module 3: Congestion and Freight Measures
Module 4: Data for Measuring Highway System Performance
Module 5: Calculating Congestion and Freight Measures
Module 6: Setting System Performance Targets
Module 7: Performance Evaluation and Reporting

The original course was launched in March 2019. This version of the course, which removes the live webconference component, was launched in September 2019.

Some of the modules include hands-on exercises to practice the calculations. Following these modules, participants must complete an end-of-course-assessment covering the content of the WBT modules.

To enroll in this WBT course, select ‘Add To Cart’.

Outcomes
Upon completion of the course, participants will be able to:
• Describe the transportation performance management requirements related to highway system performance.
• Describe the performance-based planning process as it applies to highway system performance.
• Identify required highway system performance measures and their role in system performance management.
• Identify the steps in processing highway system performance data, including manipulating the probe data sets to obtain the data needed to calculate the performance measures.
• Calculate highway system performance measures.
• Discuss the application of target setting approaches to highway system performance.
• Describe required process for highway system performance monitoring, reporting, and evaluation.

Target Audience
The target audience for this WBT course includes staff involved in establishing system performance targets for State
Departments of Transportation (State DOT) staff and Metropolitan Planning Organizations (MPOs). This target audience includes planners, system operators, traffic engineers, freight planners, and performance managers from State, local, and Federal agencies and MPOs. FHWA Division Office Freight staff is also included as target audience for this course.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $0 Per Person; 2023: $0 Per Person

**LENGTH:** 6 HOURS (CEU: .6 UNITS)

**CLASS SIZE:** MINIMUM: 0; MAXIMUM: 0

*NHI Customer Service:* (877) 558-6873 • nhicustomerservice@dot.gov
Getting Started on Effective TPM for the On-Road Mobile Source Emissions Reduction Measure

‘Getting Started on Effective TPM for the On-Road Mobile Source Emissions Reduction Measure’ is a one-hour Web-based training (WBT) course offered by NHI, the authoritative source in transportation training.

The passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America’s Surface Transportation (FAST) Act ushered in a range of new provisions for the Federal-aid highway program related to transportation performance management and highway infrastructure. State Departments of Transportation (DOTs), metropolitan planning organizations (MPOs), FHWA Division Offices, and other stakeholders are seeking information about requirements, as well as noteworthy practices.

This course provides an effective, time efficient, and accessible format for practitioners in State DOTs, MPOs, FHWA, and other groups. This format provides a richer context for information than static materials through the use of knowledge checks and other interactive features.

The goal of this course is to introduce you to the legislation and regulatory requirements related to measurement and reporting of on-road mobile source emissions reductions associated with CMAQ projects. The course will help you build a working knowledge of the actions necessary to meet these requirements. The course will also give you the skills needed to comply with regulation requirements, including data needs, measure calculations, reporting, target setting, and collaboration with partners.

The course is organized into the following lessons:

=Welcome and Overview
=Performance Measures
=Data
=Calculating the Measure
=Target Setting
=Reporting and Timeline
=Collaboration
=Wrap-Up

This course was launched in September of 2019.

The course includes an end-of-course assessment.

To enroll in this Web-based Training course, select ‘Add To Cart.’

OUTCOMES

Upon completion of the course, participants will be able to:

• Identify how TPM can benefit your State DOT or MPO
• Identify the performance measure established for CMAQ on-road mobile source emissions reductions
• Explain who is affected by a performance measure related to CMAQ on-road mobile source emissions reductions
• Identify the requirements for data submission and explain the importance of submitting timely, complete, and quality data
• Calculate cumulative CMAQ program-related emission reductions over 2 and 4 years
• Identify target setting requirements and suggested approaches associated with the TPM measure for CMAQ on-road mobile source emissions reductions
• Identify additional considerations related to the TPM measure for CMAQ on-road mobile source emissions reductions
• Identify the different reports, requirements, and important deadlines associated with TPM for CMAQ on-road mobile source emissions reduction measure
• Identify the importance of collaboration to meet the CMAQ on-road mobile source emissions measure regulatory
requirements and suggested strategies for coordination

TARGET AUDIENCE
The target audience for this web-based training course includes CMAQ program managers and staff with TPM responsibilities at State DOTs and MPOs whose geographic boundaries include any part of a nonattainment or maintenance area for ozone, carbon monoxide, or particulate matter and, therefore, receive Federal CMAQ funding for transportation projects that improve air quality.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-138021

Course Title
Data for TPM

‘Data for TPM’ is a ninety-minute Web-based training (WBT) course offered by NHI, the authoritative source in transportation training.

The passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America’s Surface Transportation (FAST) Act ushered in a range of new provisions for the Federal-aid highway program related to transportation performance management and highway infrastructure. State Departments of Transportation (DOTs), metropolitan planning organizations (MPOs), FHWA Division Offices, and other stakeholders are seeking information about requirements, as well as noteworthy practices.

This course provides an effective, time-efficient, and accessible format for practitioners in State DOTs, MPOs, FHWA, and other groups. This format provides a richer context for information than static materials through the use of knowledge checks and other interactive features.

The goal of this course is to introduce you to the legislation and regulatory requirements related to the management and use of data. The course will help you build a working knowledge of how to meet TPM requirements of 23 CFR 490 and the associated MAP-21 and FAST Acts—including the specific skills of collecting data, processing and storing data, data distribution and retrieval, data analysis, and data delivery.

The course is organized into the following lessons:
= Welcome and Overview
= Data for TBM Business Practices
= The Who and What of Data for TPM
= Data Management for TPM
= Data Improvement Planning
= Wrap-Up

This course was launched in November of 2019.

The course includes an end-of-course assessment.

To enroll in this Web-based Training course, select ‘Add To Cart.’

Outcomes
Upon completion of the course, participants will be able to:

• Identify the role of data for TPM in your State DOT or MPO and your own role in data for TPM
• Identify the data required to support TPM business practices
• Distinguish between the different data audiences
• Identify methods for delivering data to your agency’s data audiences
• Define methods to address data quality
• Identify data elements and attributes that need to be consistently defined across program areas to integrate data
• Describe the importance of data governance
• Identify how to address data gaps in a Data Management and Improvement Plan
• Describe the benefits of using a Data Management and Improvement Plan
• Identify additional resources for learning about data for TPM

Target Audience
The target audience for this web-based training course includes safety, infrastructure condition, congestion reduction, system reliability, freight movement, and environmental sustainability data managers and analysts who want to understand how to support TPM.
Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 1.5 Hours (CEU: 0 Units)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Making the Connection between HPMS Data Items and TPM

‘Making the Connection between Highway Performance Monitoring System (HPMS) Data Items and TPM’ is a ninety-minute Web-based training (WBT) course offered by NHI, the authoritative source in transportation training.

The passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America’s Surface Transportation (FAST) Act ushered in a range of new provisions for the Federal-aid highway program related to transportation performance management and highway infrastructure. State Departments of Transportation (DOTs), metropolitan planning organizations (MPOs), FHWA Division Offices, and other stakeholders are seeking information about requirements, as well as noteworthy practices.

This course provides an effective, time-efficient, and accessible format for practitioners in State DOTs, MPOs, FHWA, and other groups. This format provides a richer context for information than static materials through the use of knowledge checks and other interactive features.

The goal of this course is to introduce you to HPMS as it relates to TPM, as well as data items used to meet TPM requirements. The course will help you understand how HPMS supports TPM performance measures, as well as how TPM has affected HPMS requirements. The course will also help you understand reporting requirements for each of the data items included in the course. This knowledge will help you ensure the HPMS workflows and processes at your State DOTs align with the HPMS requirements and timeline. Additionally, you will gain the knowledge and skills needed to collect, process, and report TPM-related data in an HPMS-compliant manner.

The course is organized into the following lessons:

=Welcome and Overview
=Sections Data Set
=Inventory Data Items
=Pavement Data Items
=Special Networks Data Items
=Travel Time Data Items
=Overview of Reporting Requirements
=Overview of Timeline Requirements

This course was launched in November of 2019.

The course includes an end-of-course assessment.

To enroll in this Web-based Training course, select ‘Add To Cart.’

OUTCOMES

Upon completion of the course, participants will be able to:

• Identify why TPM requirements were created
• Identify how HPMS supports TPM national goals and performance measures
• Recognize the importance of following data submission requirements
• Identify the reporting requirements for the Sections dataset
• Identify reporting requirements for select inventory data items, pavement data items, special networks, and National Highway System (NHS) data items, and travel time data items
• Recognize the importance of updating existing workflows to align with reporting requirements related to TPM
• Identify how to process data to meet HPMS reporting requirements
• Recognize changes to the HPMS timeline for data collection related to TPM and for reporting due to TPM
• Identify what happens to the data post-submission
TARGET AUDIENCE
The target audience for this web-based training course includes State Department of Transportation (DOT) HPMS coordinators and staff that collaborate within their respective agencies (from other offices, divisions, etc.) for HPMS purposes; performance analysts including, but not limited to, traffic engineers, pavement engineers, GIS analysts, and roadway inventory management analysts; junior-level State DOT employees or employees unfamiliar with HPMS; and State DOT consultants.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1.5 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Communicating and Reporting on Transportation Performance Management

‘Communicating and Reporting on Transportation Performance Management’ is a one-hour Web-based training (WBT) course offered by NHI, the authoritative source in transportation training.

The passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America’s Surface Transportation (FAST) Act ushered in a range of new provisions for the Federal-aid highway program related to transportation performance management and highway infrastructure. State Departments of Transportation (DOTs), metropolitan planning organizations (MPOs), FHWA Division Offices, and other stakeholders are seeking information about requirements, as well as noteworthy practices.

This course provides an effective, time efficient, and accessible format for practitioners in State DOTs, MPOs, FHWA, and other groups. This format provides a richer context for information than static materials through the use of knowledge checks and other interactive features.

The goal of this course is to provide you with a foundational knowledge base about how communicating and reporting on transportation performance provides a rigorous practice to promote transparency and accountability. Topics include the products, techniques, and processes used to communicate performance information to different audiences for maximum impact.

The course is organized into the following lessons:
- Welcome and Overview
- Implementing Reporting
- Stakeholder Communication Parts 1 and 2

This course was launched in December of 2019.

The course includes an end-of-course assessment.

To enroll in this Web-based Training course, select ‘Add To Cart.’

OUTCOMES

Upon completion of the course, participants will be able to:

- Identify how transportation performance management (TPM) provides a rigorous reporting and communication practice to promote transparency and accountability
- Identify the benefits of, and elements essential to, communicating and reporting on TPM
- Compare the purposes of, and audiences for, internal and external transportation performance reporting
- Distinguish the steps for integrating internal reporting into the TPM process to the steps for integrating external reporting into the TPM process
- Distinguish between exploratory data analysis and explanatory data analysis
- Identify components of an effective reporting performance story
- Identify how to select visuals to illustrate a performance story
- Identify the impact of biases on performance storytelling
- Identify how to use numbers correctly to illustrate a performance story
- Identify additional resources for learning about communicating and reporting on transportation performance

TARGET AUDIENCE

The target audience for this web-based training course includes practitioners in State DOTs and MPOs responsible for communicating and reporting on transportation performance.
**TRAINING LEVEL:** Basic

**FEE:** 2022: $0 Per Person; 2023: $0 Per Person

**LENGTH:** 1 HOURS (CEU: 0 UNITS)

**CLASS SIZE:** MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-138024

COURSE TITLE
Monitoring and Adjustment for TPM

‘Monitoring and Adjustment for TPM’ is a ninety-minute Web-based training (WBT) course offered by NHI, the authoritative source in transportation training.

The passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America’s Surface Transportation (FAST) Act ushered in a range of new provisions for the Federal-aid highway program related to transportation performance management (TPM) and highway infrastructure. State Departments of Transportation (DOTs), metropolitan planning organizations (MPOs), FHWA Division Offices, and other stakeholders are seeking information about requirements, as well as noteworthy practices.

This course provides an effective, time-efficient, and accessible format for practitioners in State DOTs, MPOs, FHWA, and other groups. This format provides a richer context for information than static materials through the use of knowledge checks and other interactive features.

The goal of this course is to provide you a foundational knowledge base about processes used to track and evaluate actions taken and outcomes achieved, thereby establishing a feedback loop to refine planning, programming, and target-setting decisions. This foundation will enable you to use performance data to obtain key insights into the effectiveness of decisions and identify where adjustments need to be made to improve performance.

The course is organized into the following lessons:
= Welcome and Overview
= The Relationship to TPM
= The System-Level Monitoring and Adjustment Process
= The Program and Project-Level Monitoring and Adjustment Process

This course was launched in December of 2019.

The course includes an end-of-course assessment.

To enroll in this Web-based Training course, select ‘Add To Cart.’

OUTCOMES

Upon completion of the course, participants will be able to:
- Identify how monitoring involves using performance data to obtain key insights into the effectiveness of decisions
- Identify how adjustments involve using key insights captured during monitoring to improve performance
- Identify the relationship between monitoring and adjustment and the TPM components from the FHWA TPM Guidebook
- Define systems-level monitoring and adjustment and program- and project-level monitoring and adjustment
- Identify the steps for implementing both system-level monitoring and adjustment and project-level monitoring and adjustment from the FHWA TPM Guidebook

TARGET AUDIENCE

The target audience for this web-based training course includes practitioners in State DOTs and MPOs responsible for monitoring and adjustment of transportation performance.
TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1.5 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-138025

Course Title
Investment Decision Making and TPM

‘Investment Decision Making & TPM’ is a ninety-minute Web-based training (WBT) course offered by NHI, the authoritative source in transportation training.

The passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America’s Surface Transportation (FAST) Act ushered in a range of new provisions for the Federal-aid highway program related to transportation performance management and highway infrastructure. State Departments of Transportation (DOTs), metropolitan planning organizations (MPOs), FHWA Division Offices, and other stakeholders are seeking information about requirements, as well as noteworthy practices.

This course provides an effective, time efficient, and accessible format for practitioners in State DOTs, MPOs, FHWA, and other groups. This format provides a richer context for information than static materials through the use of knowledge checks and other interactive features.

The goal of this course is to provide you a foundational knowledge base about how legislative and regulatory requirements related to TPM and asset management affect investment decision making during planning. This foundation will give you the skills needed to help your DOT or MPO integrate the requirements into your wider investment decision-making processes.

The course is organized into the following lessons:
= Welcome and Overview
= Cross-Asset Resource Allocation & MODA Techniques
= MODA Framework
= Basic Principles of Enterprise Risk Management

This course was launched in December of 2019.

The course includes an end-of-course assessment.

To enroll in this Web-based Training course, select ‘Add To Cart.’

Outcomes
Upon completion of the course, participants will be able to:

• Identify how investment decision making at your State DOT or MPO can be strengthened during development of statewide or metropolitan plans by integrating it with TPM elements (including goals, measures, and targets)

• Identify how a MODA framework and MODA techniques can help practitioners consider tradeoffs and optimize allocation of transportation investments to achieve desired performance outcomes via cross-asset allocation

• Identify how programming within and across performance areas is beneficial

• Identify the importance of choosing broad strategies during planning that will inform selection of projects during programming that best ensure progress toward performance goals, objectives, or targets

• Identify the importance of evaluating tradeoffs across alternative investment scenarios, based on comparison of their predicted impacts on performance targets and goals

• Identify how risk management complements investment decision making and TPM

• Identify how MODA can be used to help with risk management

Target Audience
The target audience for this web-based training course includes practitioners and supervisors in State DOTs and MPOs responsible for planning, programming, performance management, and asset management.
**Training Level:** Basic

**Fee:** 2022: $0 Per Person; 2023: $0 Per Person

**Length:** 1.5 Hours (CEU: 0 Units)

**Class Size:** Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-139006

Course Title
Integrating Freight into Transportation Decision Making

This course will be free of charge for the remainder of 2021.

Freight transportation issues can be complex and involve many different stakeholders, all of whom have different perspectives on the freight transportation system. The challenge faced by many public-sector transportation professionals is how to best incorporate these freight perspectives into the transportation decision-making process in a way that results in a safe and efficient transportation system for both people and goods. This Web-based training course will provide a greater understanding of freight trends, its stakeholders, and its issues, so that public-sector transportation professionals are better able to incorporate freight into their respective transportation processes and programs.

It is recommended that you take this course before other Freight courses.

Outcomes

Upon completion of the course, participants will be able to:

• Identify the stakeholders involved in freight transportation
• Explain the role of different modes in freight transportation
• Describe some trends affecting freight transportation, and their impact on the transportation system and communities
• Discuss some of the common issues that prevent freight from being fully incorporated into the transportation decision-making process
• Identify key resources to help guide statewide and metropolitan freight planning effort
• Determine the impact and reach of decisions on freight during the transportation decision-making process

Target Audience

The target audience for this course is comprised of staff from a broad range of agencies (FHWA, MPOs, State DOTs, local jurisdictions, AMPO, NARC, NADO, AASHTO, as well as other State and regional agencies) who must take freight into account in their transportation decision-making processes.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 6 Hours (CEU: .6 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-139011

Course Title
Fundamentals of Freight Data Workshop

The Federal Highway Administration’s (FHWA) one and half day workshop, Fundamentals of Freight Data is intended for freight transportation professionals at state Departments of Transportation (DOT) and Metropolitan Planning Organizations (MPO), including planners and policy- and decision-makers who need information on freight data for a variety of uses. These freight data uses include regional profiles, Long-Range Transportation Plans (LRTP), State Freight Plans, State and MPO Transportation Improvement Plans (STIP/TIP), freight performance measures, forecasting, studies facility/corridor planning and strategic policy planning, among others.

The workshop will provide participants with a broad knowledge of freight data sources. As well as the ability to utilize freight data for transportation planning program/project development and policy analysis.

It is important to understand the topic of freight for many reasons, including: policy and strategic planning, local planning, project development, operations and performance management. Understanding and being able to use freight data is not an easy endeavor, yet it is one that is critical to master for many transportation planning projects. This workshop provides broad knowledge of the freight data sources used in the primary freight activities needed for transportation planning and effective policy decision making.

This workshop is not meant to be a comprehensive and in-depth examination of freight data and its applications. It will present the characteristics and key limitations of existing data, methods for collecting local/state data, and overall use of freight data.

Outcomes
Upon completion of the course, participants will be able to:
• Understand needs and uses for freight data
• Identify the major sources and types of freight data
• Review noteworthy applications of freight data
• Determine freight data needs for your organization

Target Audience
The target audience for this training includes those individuals directly involved in freight activities, including: State DOT transportation and freight planners, city and county planners who deal with freight issues, MPO staff, public sector transportation and freight planners, economic development analysts, and FHWA employees. It is expected that attendees will already have a basic freight transportation foundation before attending this workshop. Participants should be familiar with general freight terminology, modes and trends before participating in this workshop. The NHI course, Integrating Freight in the Transportation Planning Process (139006) which is offered online or equivalent experience can provide the fundamentals necessary to prepare for this workshop.

Training Level: Basic

Fee: 2022: $725 Per Person; 2023: $725 Per Person

Length: 1.5 DAYS (CEU: 0 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-139012

Course Title
Fundamentals of Freight Data

The Federal Highway Administration’s (FHWA) two and a half hour, Fundamentals of Freight Data is intended for freight transportation professionals at state Departments of Transportation (DOT) and Metropolitan Planning Organizations (MPO), including planners and policy- and decision-makers who need information on freight data for a variety of uses.

It is important to understand the topic of freight for many reasons, including policy and strategic planning, local planning, project development, operations and performance management. Understanding and being able to use freight data is not an easy endeavor, yet it is one that is critical to master for many transportation-planning projects. This WBT provides broad knowledge of the freight data sources used in the primary freight activities needed for transportation planning and effective policy decision making.

This web-based training (WBT) is not meant to be a comprehensive and in-depth examination of freight data and its applications. It will present the characteristics and key limitations of existing data, methods for collecting local/state data, and overall use of freight data. While this course provides introductory level information and strategies related to freight data, it also requires learners to apply what they learn and make decisions related to common freight data issues including freight generators and land use, freight movement, system condition and performance, and safety.

Outcomes
Upon completion of the course, participants will be able to:
• Describe freight data key terms.
• Describe issues with freight data.
• Determine when freight data are needed to solve a problem.
• Describe how freight data are obtained.
• Identify data gaps and strategies to fill identified gaps.
• Determine strategies for getting value out of the freight data you use.
• Identify freight data applications.

Target Audience
The target audience for this WBT includes seasoned staff interested in obtaining new insights to entry-level staff being introduced to the topic to support the public agency and meet federal planning requirements. While the target audience consists of a broad range of transportation professionals, the primary target audience includes planners, analysts, and data technicians within public sector transportation agencies such as state DOTs, metropolitan/regional planning organizations, or economic development agencies. Target audience members may also have roles responsible for freight data collection, analysis, modeling and data visualization.

Training Level: Basic
Fee: 2022: $0 Per Person; 2023: $0 Per Person
Length: 4 HOURS (CEU: .4 UNITS)
Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-139013

COURSE TITLE
Freight and Land Use

This is the pilot session for course NHI-139013 Freight and Land Use.

Well-planned and efficient transport networks are the foundation of economic prosperity. These networks have far-reaching effects on human and natural environments and can be the catalyst for the transformation of communities.

This course is focused on guiding planning practitioners on how to integrate freight and land use considerations within the transportation planning and programming process. It also covers the tools and resources that can be used to coordinate freight in the context of existing transportation systems and land uses, as well as the impacts of freight development and growth on an area’s land use planning goals.

This web-based training (WBT) consists of six content lessons and a final assessment.

OUTCOMES
Upon completion of the course, participants will be able to:

• Relate the role of freight to e-commerce supply chain flows
• Examine the importance of coordinating land use policies and freight transportation planning
• Evaluate methods for coordinating freight land use with local, regional, and state comprehensive and transportation planning processes
• Outline transportation and land use requirements and expected outcomes of freight land uses
• Contrast methods to minimize, avoid, or mitigate impacts of freight land uses on surrounding land uses and the environment
• Assess examples of sustainable, freight-efficient land use strategies and initiatives

TARGET AUDIENCE
The target audience for the Freight and Land Use WBT includes a variety of transportation and planning professionals involved in local transportation or land use planning, representing both public and private sector functions. The content of this course is designed for professionals within State and local transportation agencies, Tribal Governments, metropolitan or regional planning organization, or an economic development agency, who may not necessarily be well-versed in freight land use issues, including: Municipal and county land use and transportation plannersMunicipal and county elected officials and planning commissionsLocal, regional, state, and Tribal government economic development officialsMetropolitan planning organization (MPO) staffState department of transportation (DOT), freight, transportation and environmental planners, and engineersPort and port authority staffPrivate sector stakeholders, particularly representatives from industrial real estate development, trucking, and rail and other industry associationsFederal transportation employees, particularly the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and the Maritime Administration (MARAD) staff*Additionally, this course may also be of benefit to: Federal and state resource agency staff; shippers or industry leaders; and consultants involved in local transportation land use planning.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 5.5 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov

Web site: www.nhi.fhwa.dot.gov • E-mail: nhicustomerservice@dot.gov
Course Number
FHWA-NHI-141029

Course Title
Basic Relocation under the Uniform Act

The course is designed for the beginning relocation agent or for those persons interested in a basic knowledge of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act). The purpose is to answer questions, meet technical needs, and broaden the knowledge of those engaged in the relocation of persons displaced as a result of a Federal or Federally-funded project. The course covers all functional areas of the relocation assistance program, with emphasis on residential displacements.

Outcomes
Upon completion of the course, participants will be able to:
• Explain the principles of the Uniform Act and implementing regulations
• Describe the Uniform Act planning requirements
• Describe an agency’s advisory services responsibilities
• Describe the elements of comparable replacement housing
• Calculate replacement housing payments for owners and tenants
• Explain replacement housing of last resort
• Compute residential and non-residential moving costs

Target Audience
Federal, State, and local public agencies, FHWA personnel, and other interested persons.

Training Level: Basic

Fee: 2022: $800 Per Person; 2023: $800 Per Person

Length: 3 DAYS (CEU: 1.8 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-141030

COURSE TITLE
Advanced Relocation under the Uniform Act

This training goes beyond the basic functional areas of relocation assistance and concentrates on areas of specific concern, such as mortgage differential payments, settlement costs, and partial acquisitions. Other topics, including comparability, last resort housing, multiple use, tenants, and nonresidential moves – including businesses, are also covered. The training is designed to allow flexibility in adjusting course materials to meet the needs of the requesting agency.

Prerequisites: Completion of FHWA-NHI-141029 Basic Relocation and the Web-based training FHWA-NHI-141045 Real Estate Acquisition Under the Uniform Act: An Overview or approximately one year of experience working in the relocation program.

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain the principles that govern relocation provisions of the Uniform Relocation and Real Property Acquisition Policies Act of 1970 (Uniform Act) and implementing regulations
• Describe at least three factors involved in difficult relocation subject areas
• Describe issues that may arise when developing advisory assistance plans for difficult relocation areas
• Determine eligibility for certain relocation payments in difficult relocation cases
• Determine challenging issues when calculating complex nonresidential moving costs
• Calculate complex nonresidential moving costs

TARGET AUDIENCE
Federal, State, and local public agencies, FHWA personnel, right-of-way contractors, and other interested persons.

TRAINING LEVEL: Intermediate

FEE: 2022: $850 Per Person; 2023: $850 Per Person

LENGTH: 3 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-141031

Course Title
Business Relocation under the Uniform Act
This course provides comprehensive information on the various aspects of business relocation and is designed to address the relocation of businesses, farms and nonprofit organizations. The main topics include eligibility, moving payments and benefits, advisory services, actual direct loss of tangible personal property, substitute personal property payments, reestablishment expenses, and fixed payment in lieu of (ILO) payments. A module about the move process includes the move option available to a business, as well as the need for an inventory and move specifications.

Outcomes
Upon completion of the course, participants will be able to:
• Provide advisory services for businesses
• Determine moving and related expense payments for businesses, farms and non-profit organizations
• Determine reestablishment expenses for small businesses
• Determine fixed payments for businesses, farms and non-profit organizations
• Evaluate the move process for businesses
• Determine how to move hazardous materials for businesses

Target Audience
State departments of transportation, local public agencies, FHWA personnel, and other Federal agency personnel. Suggest that participants have at least two years general relocation experience.

Training Level: Accomplished

Fee: 2022: $800 Per Person; 2023: $800 Per Person

Length: 3 DAYS (CEU: 1.8 UNITS)

Class Size: Minimum: 20; Maximum: 35

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-141044

COURSE TITLE
Appraisal Review for Federal-Aid Highway Programs

Please note that this training has been approved for Continuing Education Credits in several States by their respective appraisal licensing boards. As part of our course delivery, we will assist in preparing the documents required for course approval in your State. However, any fees associated with the application process are the responsibility of the requestor. Additionally, this training counts toward IRWA’s SR/WA designation and R/W-AC re-certification. Participants should bring an HP 12c calculator for the classroom exercises.

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended (Uniform Act) ensures that persons whose real property is acquired or who are displaced as a result of a Federal or Federally-assisted project are treated fairly and consistently. This course focuses on the application of appraisal review principles and how they fit within the Uniform Act and 49 CFR Part 24 as related to transportation project development. Focusing on larger parcel, uneconomic remnants, cost to cure, and severance damages, the course discusses the qualifications, roles, and responsibilities of the review appraiser from pre- to post-appraisal activities.

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain basic eminent domain principles
• Apply Federal-Aid appraisal review requirements
• Apply appraisal review techniques to unique situations within Federal-Aid highway programs
• Describe the role of the review appraiser in the land acquisition process

TARGET AUDIENCE
State departments of transportation (DOTs), local public agencies (LPAs), city and county attorneys, consultants; FHWA and other Federal agency staff involved in the appraisal process. Prerequisite: A course in the basic practices and principles of real estate appraisal (e.g. International Right of Way Association course 400, the Appraisal Institute’s courses 110 and 120) or a college-level course in appraisal.

TRAINING LEVEL: Accomplished

FEE: 2022: $400 Per Person; 2023: $400 Per Person

LENGTH: 1 DAYS (CEU: .6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 35

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
REAL ESTATE ACQUISITION UNDER THE UNIFORM ACT: AN OVERVIEW - WEB-BASED

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act) is the basis for Federally-funded real estate acquisition programs. This self-paced training provides an overview of the Uniform Act's three key elements: valuation, acquisition, and relocation. This course underscores the importance of following Uniform Act requirements when acquiring property for a Federally-funded transportation project.

OUTCOMES
Upon completion of the course, participants will be able to:

• Provide a basic overview of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act)
• Discuss the three key elements of the Uniform Act: valuation/appraisal, acquisition and relocation
• Explain how to develop an estimate of just compensation using the appraisal process or appraisal waiver procedure(s)
• Identify relocation benefits and services required by the Uniform Act
• List places to obtain relevant resource documents and materials

TARGET AUDIENCE
Federal, State, and local government employees and consultants who acquire real estate for Federally-funded transportation projects. This includes acquisition and relocation agents; program or project managers; grant administrators or grant recipients; appraisers, realty specialists, attorneys, engineers, planners, and others involved with real property acquisition.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 6 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-141047

Course Title
Local Public Agency Real Estate Acquisition - WEB-BASED

141047 Local Public Agency Real Estate Acquisition training is designed for those who are unfamiliar with Federal requirements when acquiring real property for Federally-assisted transportation projects. This training provides participants with a working knowledge of these Federal requirements when acquiring real property, including relocation guidance related to individuals and businesses.

Comprised of seven distinct learning modules, this self-paced Web-based training (WBT) provides an overview on real estate acquisition authority and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act) and related regulations. Additional modules include project development and administrative matters; valuation; acquisition and negotiation; relocation; and property management. This training also includes case studies, important resources, and suggestions for other companion courses.

Failure to comply with the Uniform Act when acquiring real property for a Federally-funded transportation project can put this funding at risk and may lead to project delays.

Outcomes
Upon completion of the course, participants will be able to:

- Explain the statutory basis for Federal requirements and relate these to State and local laws, regulations and procedures
- Explain the intent of the Uniform Act and describe what States and LPAs must do to comply
- Describe how a typical project is developed and strategies for enhancing project delivery
- Describe the LPA role in the appraisal process and determine the appropriate valuation format for specific situations
- Describe the sequence for land acquisition and options available to the negotiator
- Explain what relocation advisory services are to be provided to property owners and tenants and differentiate the residential and nonresidential relocation processes
- Summarize various property management activities and evaluate property management actions using specific case studies

Target Audience
Those within local public agencies who are responsible for acquiring right-of-way for federally-funded projects, as well as those responsible for oversight of LPAs, in addition to FHWA personnel, consultants, Federal and State staff and other interested parties.

Training Level: Basic

Fee: 2022: $50 Per Person; 2023: $0 Per Person

Length: 6 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-141048

Course Title
Outdoor Advertising Control: Bonus States - WEB-BASED

Outdoor Advertising Control (OAC) limits the location, size, spacing, and lighting of signs adjacent to the interstate, National Highway System, and other Federal-Aid primary routes. Regulators are responsible for enforcing these requirements. The material in this training applies to all States and will help participants interpret major legislation and make effective decisions in support of OAC.

There are two related OAC Web-based trainings (WBTs): one designed for Bonus States (23 states) and the other for the remaining non-Bonus States. 141048 Outdoor Advertising Control: Bonus States includes one additional lesson addressing unique requirements these States must follow. Please refer to 141049 for information on this companion course.

Comprised of eight distinct learning modules, this self-paced WBT addresses Federal laws and regulations regarding signs adjacent to the right-of-way; zoning and related programs; commercial advertising signs adjacent to the right-of-way; recognized Federal sign classifications; implementation; maintenance and illegal sign removal; acquisition of signs on highway projects under the Uniform Act, as amended; and bonus state requirements.

This training provides participants an overview on laws and requirements related to Outdoor Advertising Control.

Outcomes
Upon completion of the course, participants will be able to:
• Apply Federal laws and regulations to assist in interpreting State and local laws and regulations for effective control
• Identify major Federal outdoor advertising legislation and regulations, and their importance for effective control
• Implement the process of effective control

Target Audience
State department of transportation employees; county, city town, and township staff involved with outdoor advertising; FHWA staff; and consultants assisting governmental entities with their Outdoor Advertising Control program.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 6 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-141049

Course Title
Outdoor Advertising Control: Non-Bonus States - WEB-BASED

Outdoor Advertising Control (OAC) limits the location, size, spacing, and lighting of signs adjacent to the interstate, National Highway System, and other Federal-Aid primary routes. Regulators are responsible for enforcing these requirements. The material in this training applies to all States and will help participants interpret major legislation and make effective decisions in support of OAC.

There are two related OAC Web-based trainings (WBTs): one designed for Bonus States (23 states) and the other for the remaining non-Bonus States. 141049 Outdoor Advertising Control: Non-Bonus States and 141048 Outdoor Advertising Control: Bonus States. Please refer to 141048 for information on this companion course.

The course follows recommended FHWA specifications and practices for drilled shaft construction but may be modified to follow local agency specifications and practices.

Comprised of seven distinct learning modules, this self-paced WBT addresses Federal laws and regulations regarding signs adjacent to the right-of-way; zoning and related programs; commercial advertising signs adjacent to the right-of-way; recognized Federal sign classifications; implementation; maintenance and illegal sign removal; and acquisition of signs on highway projects, under the Uniform Act, as amended.

This training provides participants an overview on laws and requirements related to Outdoor Advertising Control.

Outcomes
Upon completion of the course, participants will be able to:

- Apply Federal laws and regulations to assist in interpreting State and local laws and regulations for effective control
- Identify major Federal outdoor advertising legislation and regulations, and their importance for effective control
- Implement the process of effective control

Target Audience
State department of transportation employees; county, city town, and township staff involved with outdoor advertising; FHWA staff; and consultants assisting governmental entities with their Outdoor Advertising Control program.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 6 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-141050

COURSE TITLE
Introduction to Federal-Aid Right of Way Requirements for Local Public Agencies

This two-day introductory course provides Local Public Agencies (LPAs) with a working knowledge of Federal requirements and procedures for acquiring property for Federally-assisted transportation projects. The course focuses on applying the Uniform Act and related Federal Regulations to specific situations and issues. Designed as a hands-on, highly interactive learning experience, instructors guide participants through a series of right-of-way (ROW) problem solving exercises and large group discussions. We encourage those with limited ROW knowledge to register for the free NHI 141045 web-based training course in advance of this instructor-led course session.

OUTCOMES
Upon completion of the course, participants will be able to:
• Explain the legal basis for land acquisition by a governmental entity
• Assess the impact of a roadway improvement as it relates to the Uniform Act
• Sequence the right-of-way process (ROW) within the overall project development process
• Determine the appropriate valuation process for ROW acquisition
• Apply the Uniform Act requirements for ROW acquisition
• Apply the Uniform Act requirements to relocation assistance
• Determine the agency’s responsibilities for managing real property

TARGET AUDIENCE
Those within local public agencies who are responsible for acquiring right-of-way for federally-funded projects, as well as those responsible for oversight of LPAs, in addition to FHWA personnel, consultants, Federal and State staff and other interested parties.

TRAINING LEVEL: Basic

FEE: 2022: $600 Per Person; 2023: $600 Per Person

LENGTH: 2 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 35

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-141052

COURSE TITLE
Successful Acquisition under the Uniform Act
This course will provide the knowledge and skills that a public agency negotiator needs to complete acquisitions that comply with the Uniform Act.

OUTCOMES
Upon completion of the course, participants will be able to:
• Explain the legal basis for land acquisition by a governmental entity
• Identify the pre-acquisition materials necessary for property acquisition
• Explain the basics of the valuation process
• Describe the acquisition process under the Uniform Act
• Formulate effective negotiation skills, using best practices
• Discuss legal aspects of real property acquisition
• Discuss the role and limitations of consultants in the acquisition process

TARGET AUDIENCE
Federal, State, and local public agencies, FHWA personnel, contractors, and other interested persons.

TRAINING LEVEL: Basic

FEE: 2022: $800 Per Person; 2023: $800 Per Person

LENGTH: 3 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-141053

COURSE TITLE
Foundations of Federal-Aid Highway Program Appraisals

Foundations of Federal-Aid Highway Program Appraisals is a 7-hour Web-based Training course offered by NHI, the authoritative source in transportation training, and certified by the International Distance Education Certification Center (IDECC).

To appraise real property for acquisition for Federal-aid highway programs, it is essential for appraisers to understand how to incorporate Uniform Act and 49 CFR Part 24 appraisal requirements into classical appraisal principles.

This course helps improve conformity with appraisal requirements of the Uniform Act and implementing requirements of 49 CFR Part 24.

Learners explore the appraiser’s role in the overall project development process and how an appraiser’s expertise can assist in completing a transportation project effectively and efficiently.

At the end of each course module, learners will complete a multiple-choice module assessment to measure achievement of the course learning outcomes.

For content-related questions, please contact FHWA Realty Specialist Chad Crawford at chad.a.crawford@dot.gov.

Please know that when taking this course, you are accessing a Federal computer system and unauthorized access is prohibited. The National Highway Institute is committed to upholding the values of professional integrity and honesty. Participants are expected to enroll in the course using their unique username and password, and to complete all portions of the course independently in order to earn credit for training completion.

OUTCOMES
Upon completion of the course, participants will be able to:
• Identify the basic principles of eminent domain.
• Differentiate between eminent domain and police power.
• Differentiate between just compensation and fair market value.
• Identify Federal-aid appraisal requirements of the Uniform Act and 24 CFR Part 24 related to highway appraisals.
• Identify additional steps required for an appraisal of a partial taking versus a full taking.
• Identify appraisal techniques related to partial acquisition during a right-of-way appraisal.
• Differentiate between the Federal Rule and the State Rule for estimating the fair market value of partial acquisition.
• Identify appraisal techniques related to acquisition of easements and other real property interests.
• Apply appraisal techniques to problems unique to Federal-aid highway programs.
• Identify when to use the waiver valuation.
• Identify when the Federal-aid appraisal requirements from 49 CFR Part 24 related to the conflict of interest regulation should be applied.
• Identify the role of the appraiser in the land acquisition process prior to the appraisal.
• Identify Federal-aid appraisal requirements of 49 CFR Part 24 related to an appraisal scope of work.
• Identify the role of the appraiser in the land acquisition process after the appraisal.
• Identify an appraiser’s role during the legal process.

TARGET AUDIENCE
The target audience for this WBT course includes representatives from Federal Uniform Act Agencies, State Departments of Transportation (DOTs), Local Public Agencies (LPAs), consultant/fee appraisers, and FHWA staff involved with the appraisal process that have attended a basic practices and principles of real estate appraisal course.
TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 7 HOURS (CEU: .7 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-141054

Course Title
Practical Applications in Federal-Aid Highway Program Appraisals

Practical Applications in Federal-Aid Highway Program Appraisals is a 7-hour Web-conference Training (WCT) course offered by NHI, the authoritative source in transportation training.

This course helps improve conformity with appraisal requirements of the Uniform Act and implementing requirements of 49 CFR Part 24. Concepts presented NHI-141053 Foundations of Federal-Aid Highway Program Appraisals for specific eminent domain situations are applied to a series of real-world examples. Nuances and State-specific differences related to the application of appraisal concepts and Uniform Act requirements are addressed.

Participants explore examples of problems handled differently than typical mortgage appraisal assignments. The examples demonstrate to appraisers new to Federal-aid programs that their clients have regulatory requirements to not only determine market value of a property, but to also determine an estimate of compensation due a property owner given the unique interpretation of laws in the jurisdiction the appraiser is practicing.

The course is broken into three WCT sessions averaging two hours and 10 minutes each. At the end of each session, participants will complete a web-based, multiple-choice assessment to measure achievement of the learning outcomes.

This course has been certified by the International Distance Education Certification Center (IDECC).

Outcomes
Upon completion of the course, participants will be able to:

• Determine damages to remainder property in a partial acquisition.
• Differentiate between appraisal requirements under 49 CFR Part 24 and USPAP.
• Differentiate between just compensation and the agency’s estimate of fair market value.

Target Audience
The target audience for this WCT course includes representatives from Federal Uniform Act Agencies, State Departments of Transportation (DOT), Local Public Agencies (LPAs), consultant/fee appraisers, and FHWA staff involved with the appraisal process that have attended a basic practices and principles of real estate appraisal course.

Training Level: Intermediate

Fee: 2022: $100 Per Person; 2023: N/A

Length: 7 HOURS (CEU: .7 UNITS)

Class Size: Minimum: 10; Maximum: 26

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-141056

COURSE TITLE
Basic Nonresidential Relocation under the Uniform Act

This course is currently in a pilot stage. Participants may sign up by invitation only - any uninvited participants will be removed at this time. Please sign up for e-mail updates to be notified when this course is available next.

By completing this course, transportation professionals will develop a deeper appreciation for the Uniform Act and its sensitivity and fairness toward nonresidential displaced persons by providing interesting case studies that prompt diligent application of the law, and enable participants to advance their knowledge, skills, and abilities to hone relocation expertise for in-practice application.

OUTCOMES
Upon completion of the course, participants will be able to:

• Identify the principles of the Uniform Act and implementing regulations.
• Identify the Uniform Act planning requirements.
• Identify the Uniform Act planning requirements for nonresidential displaced persons.
• Identify an Agency’s advisory services responsibilities for nonresidential displaced persons.
• Identify the impact an appraisal has on relocation.
• Recognize problems associated with nonresidential displacements.
• Identify the options available for reimbursement of nonresidential moving expenses.
• Identify the elements of computing actual, reasonable, necessary nonresidential moving expenses.
• Identify the elements of computing other nonresidential relocation payments.
• Compute nonresidential moving costs.

TARGET AUDIENCE
Representatives from Federal Uniform Act Agencies, State Departments of Transportation (DOTs), Local Public Agencies (LPAs), FHWA personnel, and other interested persons. Specifically, this course is designed for those individuals in the field who provide relocation assistance to nonresidential entities (businesses, farms, non-profit organizations) that are being displaced by a Federal-aid project, who are either inexperienced relocation personnel or experienced relocation personnel who would like a refresher course. No prerequisite is required for participants; however, a basic knowledge of real estate leasing and purchase would be helpful.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: N/A
LENGTH: 8 HOURS (CEU: .8 UNITS)
CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134080

COURSE TITLE
Environmental Factors in Construction and Maintenance

NOTE: This course is intended for highway construction inspectors, maintenance supervisors, and other inspection and field personnel.

This is a blended course that comprises approximately 6 hours of independent study work and a 1.5-day instructor-led session. Participants must complete the independent study materials before attending the instructor-led session.

Mandated environmental considerations are an important part of all highway agencies’ roadway construction and maintenance activities. NHI 134080 Environmental Factors in Construction and Maintenance focuses on balancing the need to fulfill environmental protections and the need to complete project activities in a safe, timely, and financially responsible manner.

This course emphasizes common environmental agency regulations, adherence to plans, early and frequent communication regarding construction and maintenance commitments, and the potential for encountering unexpected issues. Course activities help participants understand how to build environmental considerations into their standard practice. Learning to relate environmental commitments to construction and maintenance processes and practices can help transportation personnel ensure compliance with numerous and increasingly complex Federal, State, and local environmental regulations.

Course content is delivered via approximately 6 hours of independent study workbook materials and a 1.5-day classroom-based, instructor-led session. Two FHWA instructors relate their construction experience and environmental knowledge to help ensure that participants in this course will be able to apply the training content immediately to their projects and duties.

OUTCOMES
Upon completion of the course, participants will be able to:

• Relate design-phase environmental commitments to construction documents
• Explain your role in early and continuous communication to support commitments that occurred during design phase
• Recognize the importance of environmental protection during construction and maintenance operations
• Describe quality control measures and documentation that can be implemented through the construction sequence to provide environmental mitigation measures
• Recognize the role of the project inspectors (and environmental inspectors, when used) in addressing environmental issues
• Describe a variety of environmental compliance and commitment tracking tools
• Identify resources for consultation on environmental issues

TARGET AUDIENCE
This course is intended primarily for Federal, State, and local highway construction inspectors, maintenance supervisors, and other inspection and field personnel who must ensure that identified environmental impacts are mitigated during construction and maintenance operations. This may include FHWA employees, as well as State employees and local agencies and consultants that oversee such activities.

TRAINING LEVEL: Basic

FEE: 2022: $300 Per Person; 2023: $300 Per Person

LENGTH: 1.5 DAYS (CEU: 1.5 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134109J

Course Title
Maintenance Training Series: Underground Storage Tanks

The Nation’s underground storage tank (UST) systems consist of underground tanks and piping that store petroleum and other hazardous materials. This course, Underground Storage Tanks, addresses the procedures to install, operate, and remove USTs.

Developed specifically for maintenance personnel, this course provides participants with an understanding of the Federal laws and regulations that govern UST systems. During the course, participants acquire the knowledge needed to successfully oversee UST installations and closures. Specifically, the course explores the requirements of industry installation and closure codes, leakage detection, spill and overfill prevention, corrosion protection, and ensuring a “clean” closure.

This training was developed as part of the Maintenance Training Series. To access all the trainings in the series, enroll in the 134109 course.

Outcomes
Upon completion of the course, participants will be able to:

• Describe the regulatory framework governing the operation of underground storage tanks
• Describe UST operations
• Describe the process that must be followed to obtain satisfactory “clean closure” from the appropriate oversight agency
• Describe UST cleanup and removal operations

Target Audience
This course is designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 1 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134109K

Course Title
Maintenance Training Series: Cultural and Historic Preservation

Cultural and historic sites are often located within an area where maintenance activities are scheduled to be completed. This training, Cultural and Historic Preservation, is teaches participants about regulations and concerns related to safeguarding cultural and historic sites from the potential impacts of highway maintenance activities. Examples of maintenance activities that can impact cultural or historic sites include slope stabilization, shoulder or pavement widening, and vegetation control. Additional examples are presented during the course.

This course assists participants with recognizing potential historic or cultural resources, verifying a site’s cultural or historic status, and avoiding impacts to sites when carrying out maintenance activities. Since completing these tasks often requires additional expertise, resources for obtaining needed assistance are provided. In addition, participants learn how maintenance activities can enhance cultural and historic sites through utilization of Context Sensitive Solutions (CSS).

This training was developed as part of the Maintenance Training Series. To access all the courses in the series, enroll in the 134109 course.

Outcomes
Upon completion of the course, participants will be able to:

• Identify governing bodies and registries that should be consulted prior to commencing maintenance activities on sites of cultural and historic importance

• Recognize what sorts of structures, landmarks, and properties could pose potential cultural and historic preservation issues

• Describe how to avoid impacts to historic sites

• Describe the role of DOT in maintaining and enhancing cultural resources

Target Audience
This course is designed for State, regional, and county personnel who manage operations programs and deal with oversight and quality assurance across broad geographic areas. This target audience also is involved with handling materials, scheduling, budgeting, and planning.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 1 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-142005

COURSE TITLE
NEPA and the Transportation Decision making Process

This comprehensive, three-day, instructor-led course presents the historical background and evolution of the National Environmental Policy Act (NEPA) and related environmental laws. It discusses their influence on FHWA's policies and procedures for the transportation project development and decisionmaking process. The course examines how the framework of laws, regulations, policies, and guidance integrate social, environmental, and economic factors in making transportation project decisions that are in the best overall public interest.

The course emphasizes the Council on Environmental Quality and FHWA's regulations; FHWA policy and guidance for implementing NEPA, Section 4(f) of the Department of Transportation Act, and related environmental requirements. It discusses the NEPA Essential Elements in detail, including purpose and need, alternatives, impacts, mitigation, public involvement, interagency coordination and documentation. The course presents the requirements and considerations used to decide whether to prepare an environmental impact statement, an environmental assessment or determination that a project is categorically excluded from either. While this is not a course in environmental document writing, it presents the key principles for preparing high quality environmental documents, including the core principles from the FHWA/AASHTO/American Council of Engineering Companies Improving the Quality of Environmental Documents and the FHWA IQED initiative. The course also includes group exercises that allow participants to apply the course concepts to a realistic project scenario involving several transportation, social and environmental considerations.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the NEPA principles in relation to transportation project development.
• Describe how the NEPA umbrella concept influences the transportation decisionmaking process.
• Explain the roles and responsibilities of participants in the NEPA process.
• Describe balancing an array of interests and values in making transportation decisions.
• List the milestones in transportation planning that link to the NEPA project development process.
• Describe the documentation requirements of the NEPA process.
• Discuss environmental streamlining, stewardship, and leadership in managing the NEPA process.

TARGET AUDIENCE
The target audience for this course includes FHWA, State departments of transportation (including consultants acting on behalf of the State), Federal and State environmental resource agencies, local governments, and metropolitan planning organizations who participate in the transportation decisionmaking process. We strongly encourage the sponsoring organization to invite a mix of planning and environmental staff from these agencies.

TRAINING LEVEL: Intermediate

FEE: 2022: $700 Per Person; 2023: $1000 Per Person
LENGTH: 3 DAYS (CEU: 1.8 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Public Involvement in the Transportation Decision making Process

Public involvement is much more than public hearings. It involves creative thinking as well as the willingness and ability to interact openly and sensitively to the public’s preferred forms of communication and participation. Public involvement is about reaching out to and involving the public in transportation decisionmaking. The public should have a role in every phase of decisionmaking, including the design of the participation plan itself. Successful public involvement addresses the public’s procedural, psychological, and substantive needs while gathering useful information. By focusing on interests—rather than positions—public involvement can become more meaningful as well as useful.

OUTCOMES

Upon completion of the course, participants will be able to:

• Describe U.S. DOT transportation decisionmaking processes, including those that trigger the National Environmental Policy Act

• Describe the relationship between public involvement and decisionmaking

• Develop a public involvement plan with stakeholder assistance that includes attention to non-traditional populations as an evaluation component

• Describe interest-based problem solving and the values that underlie it

• Identify ways to enhance public involvement plans

TARGET AUDIENCE

Federal, State, and local transportation agency staff, metropolitan planning organization personnel, transit operators, consultants, and others who are responsible for planning, implementing, or participating in any phase of the public involvement process.

TRAINING LEVEL: Basic

FEE: 2022: $500 Per Person; 2023: $755 Per Person

LENGTH: 3 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142045

Course Title
Pedestrian Facility Design

To emphasize the importance of planning for pedestrians, the course focuses on case examples involving corridor and intersection design issues. Participants are engaged through lecture, discussion, video demonstrations of problem areas in corridors and intersections, small group problem identification, and the development of design alternatives. This training was developed to provide information and application opportunities to those involved in the design of pedestrian facilities. The Americans with Disabilities Act (ADA) requires newly constructed and altered sidewalks to be accessible and usable by people with disabilities, and accessibility improvements need to be implemented for existing facilities.

Outcomes
Upon completion of the course, participants will be able to:

- List the characteristics of pedestrians and motorized traffic that influence pedestrian facility design
- Apply the concepts of universal design and applicable design reference material to redesigning an existing location and/or designing a new location that meets the needs of motorized and nonmotorized users
- Given a case example, identify potential conflicts between pedestrians and other traffic and propose design options that improve access and safety
- Given a case example, analyze the network for improvement options to meet the needs of pedestrian and other traffic

Target Audience
Engineers with planning, design, construction, or maintenance responsibilities; pedestrian and bicycle specialists, disability and orientation specialists, transportation planners, architects, landscape architects, as well as decisionmakers at the project planning level.

Training Level: Intermediate

Fee: 2022: $350 Per Person; 2023: $500 Per Person

Length: 1.5 DAYS (CEU: .9 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
INTRODUCTION TO NEPA AND TRANSPORTATION DECISIONMAKING

This newly revised Introduction to the National Environmental Policy Act (NEPA) and Transportation Decision Making course is an updated version of the existing WBT. The update incorporates the policies and regulations that have changed, since the last update in 2009. The FHWA has championed national initiatives to fully implement the environmental provisions of the 2021 Bipartisan Infrastructure Bill, the FAST Act and MAP-21 to accelerate highway program and project delivery.

This web-based training (WBT) introduces the National Environmental Policy Act of 1969 (NEPA) and FHWA's NEPA implementing regulations. NEPA requires Federal agencies to assess the environmental effects of their proposed actions, such as providing Federal funds or issuing Federal permits and licenses. Using the NEPA process, Federal agencies evaluate and disclose the social, environmental, and economic effects of their proposed actions. During NEPA reviews, agencies can also provide opportunities for public involvement and interagency dialogue to consider any competing public and special interests.

This WBT describes Federal Highway Administration’s (FHWA’s) approach to the NEPA transportation decision-making process. That process considers impacts of transportation projects on the human and natural environment while balancing with the public's need for safe and efficient transportation. This training covers NEPA regulations, policies and guidance defined by the Council on Environmental Quality and FHWA. Topics addressed include NEPA classes of action, purpose and need, alternatives development and analysis, impact analysis, public involvement, interagency coordination, mitigation, and documentation. This self-paced training is a recommended prerequisite prior to enrolling in FHWA-NHI 142005.

OUTCOMES

Upon completion of the course, participants will be able to:

- Identify the origin of NEPA
- Define the purpose and relevance of NEPA within the decision-making process.
- Illustrate the hierarchy between laws, regulations, policies, guidance, and executive orders.
- Identify where to find more information on the Council of Environmental Quality implementing regulations for NEPA, and the FHWA/FTA/FRA joint agency implementing regulations for NEPA.
- Describe the project development process for transportation projects.
- Describe how scoping prior to initiating NEPA provides a decision-making framework.
- Describe the NEPA concept of significance of effects.
- Define the three classes of action, which are the three NEPA processing options.
- Distinguish when to apply each class of action.
- Identify the essential elements of the NEPA process.
- Define the concept of purpose and need
- Examine the importance of purpose and need within the NEPA framework.
- Identify types of data that support the need for a project.
- Apply the concepts of “logical termini” and “independent utility”
- Define the concept of alternatives in transportation projects.
- Identify and consider a reasonable range of alternatives that vary with projects.
- Define environmental effects
- Describe how to identify effects
- Explain how effects analysis informs the determination of significance.
- Define mitigation as it applies to NEPA.
• Identify examples of mitigation.
• Explain the importance of scoping in the NEPA process.
• Identify the roles of the public and agencies in the scoping process.
• Identify potential stakeholders in transportation projects.
• Identify the elements of a Public Involvement Plan for a project.
• Explore methods for engaging the public.
• Evaluate what influences the level or extent of specific public involvement necessary for a project.
• Explain why agency coordination and consultation is helpful and sometimes required.
• Compare the roles and responsibilities of agencies in the NEPA process.
• Identify strategies for writing quality environmental documents.
• Identify page limit requirements for each NEPA class of action.
• Describe documentation options for each NEPA class of action.
• Define procedural and substantive law.
• Describe the importance of the Administrative Record and documentation.
• Define legal sufficiency and when it is needed.

TARGET AUDIENCE
The target audience includes staff from FHWA, State Departments of Transportation (DOT), Federal and State environmental resource agencies, Federal land management agencies, tribal governments, local governments, Metropolitan Planning Organizations (MPOs) who participate in the transportation decision-making process, and consultants supporting various Federal-aid and Federal Lands highway project sponsors.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 8 HOURS (CEU: .8 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-142062

COURSE TITLE
Administrative Record - WEB-BASED
This web-based training (WBT) course describes the purpose of an Administrative Record, explains what should be included in an Administrative Record, and presents best practices for building a defensible Administrative Record. Please note that this WBT is not meant to take the place of formal legal advice and consultation with FHWA counsel is strongly recommended.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the purpose of an Administrative Record
• Explain the factors involved in determining what should be included in an Administrative Record
• Describe best practices for building a defensible Administrative Record

TARGET AUDIENCE
This course is designed for Federal Highway Administration (FHWA) Division office staff who are responsible for the Administrative Record, as well as for State DOT employees and their contractors who need to build and maintain an Administrative Record.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person
LENGTH: 1 HOURS (CEU: 0 UNITS)
CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
The purpose of this training is to provide participants with an overview of air quality planning, including requirements, processes, interactions with and implications for, transportation planning and project development.

This is the first in a future series of air quality Web-based trainings (WBTs):
142068: Clear Air Act Overview
142069: SIP and TCM Requirements and Policies
142070: SIP Development Process
142071: Transportation Conformity

Upon completion of the course, participants will be able to:
• Define the purpose of the Clean Air Act
• Describe the 1990 Clean Air Act Amendments
• Identify and explain Clean Air Act Amendment provisions relevant to transportation
• Recognize impacts of Clean Air Act

The target audience for the Air Quality Series is transportation and air quality planners and engineers from State and local departments of transportation (DOT), metropolitan planning organizations (MPO), transit agencies, Federal agencies (Federal Highway Administration, Federal Transit Administration, U.S. Environmental Protection Agency, U.S. Department of Energy, etc.), and State and local environmental agencies. Others include transportation and environmental consultants, public officials and staff members, community and interest groups, as well as other stakeholders in the planning process.

Training Level: Basic
Fee: 2022: $0 Per Person; 2023: $0 Per Person
Length: 1.5 HOURS (CEU: 0 UNITS)
Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-142069

COURSE TITLE
Air Quality Planning: SIP and TCM Requirements and Policies - WEB-BASED

This course covers the different types of SIPs and key CAA SIP requirements general to all SIPs and specific to ozone, CO and PM SIPs; discusses how the EPA processes SIPs; explores the key features of EPA SIP policies and how they differ from CAA requirements; and explains RACM and how it applies to TCMs.

This is the second in a future series of air quality Web-based trainings (WBTs):
142068: Clear Air Act Overview
142069: SIP and TCM Requirements and Policies
142070: SIP Development Process
142071: Transportation Conformity

OUTCOMES
Upon completion of the course, participants will be able to:
• Define SIP
• List different types of SIPs and their purposes
• Identify SIP requirements in Title I of the Clean Air Act
• Describe TCM requirements
• Describe what is meant by Reasonably Available Control Measure, or RACM, and how this applies to TCMs

TARGET AUDIENCE
The target audience for the Air Quality Series is transportation and air quality planners and engineers from State and local departments of transportation (DOT), metropolitan planning organizations (MPO), transit agencies, Federal agencies (Federal Highway Administration, Federal Transit Administration, U.S. Environmental Protection Agency, U.S. Department of Energy, etc.), and State and local environmental agencies. Others include transportation and environmental consultants, public officials and staff members, community and interest groups, as well as other stakeholders in the planning process.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142070

Course Title
Air Quality Planning: SIP Development Process - WEB-BASED

This course provides an overview of the State Implementation Plan (or SIP) development process, focusing on agency roles, with an explanation of the problem definition and solution parts of the process. This course also covers motor vehicle emission budgets that are included in SIPs and used in conformity determinations, as well as describes EPAs procedures in approving and disapproving SIPs.

This is the third in a series of air quality Web-based trainings (WBTs):
142068: Clear Air Act Overview
142069: SIP and TCM Requirements and Policies
142070: SIP Development Process
142071: Transportation Conformity

Outcomes
Upon completion of the course, participants will be able to:
• Describe the SIP development process;
• Identify the various emission sources and describe emission trends;
• List the steps involved in preparing emission inventories;
• Describe how SIP emission reductions are determined; and
• Describe the different types of control measures, emphasizing the role of transportation-related strategies.

Target Audience
The target audience for the Air Quality Series is transportation and air quality planners and engineers from State and local departments of transportation (DOT), metropolitan planning organizations (MPO), transit agencies, Federal agencies (Federal Highway Administration, Federal Transit Administration, U.S. Environmental Protection Agency, U.S. Department of Energy, etc.), and State and local environmental agencies. Others include transportation and environmental consultants, public officials and staff members, community and interest groups, as well as other stakeholders in the planning process.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 2 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-142071

COURSE TITLE
Air Quality Planning: Transportation Conformity - WEB-BASED

This course defines transportation conformity and is designed for individuals that are new to transportation conformity, with little to no experience with the Transportation Conformity Rule.

This introductory transportation conformity course will answer questions related to the “what” of transportation conformity. What is transportation conformity? What activities are covered by conformity? What are the major requirements?

This course does not address how transportation conformity regulations are met. That topic is an advanced subject matter area and out of scope for an introductory transportation conformity course.

This is the fourth in a future series of air quality Web-based trainings (WBTs):
142068: Clear Air Act Overview
142069: SIP and TCM Requirements and Policies
142070: SIP Development Process
142071: Transportation Conformity

OUTCOMES
Upon completion of the course, participants will be able to:

• Relate transportation conformity to Transportation Improvement Programs (TIPs) and transportation plans
• Define transportation conformity
• Explain the transportation activities that are subject to conformity in a given timeframe
• Describe transportation conformity requirements for different activities
• Explain stakeholder responsibilities related to transportation conformity

TARGET AUDIENCE
The target audience for the Air Quality Series is transportation and air quality planners and engineers from State and local departments of transportation (DOT), metropolitan planning organizations (MPO), transit agencies, Federal agencies (Federal Highway Administration, Federal Transit Administration, U.S. Environmental Protection Agency, U.S. Department of Energy, etc.), and State and local environmental agencies. Others include transportation and environmental consultants, public officials and staff members, community and interest groups, as well as other stakeholders in the planning process.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1.5 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142073

Course Title
Applying Section 4(f): Putting Policy into Practice

NHI 142073 Applying Section 4(f): Putting Policy into Practice is a 2-day interactive course that explains the history, purpose, and application of Section 4(f) within the context of the transportation project development process. Lessons include identifying Section 4(f) properties; explanations on types of use; an overview of Section 4(f) approval options; requirements for De Minimis determinations, individual 4(f) evaluations, and nationwide programmatic evaluations; selecting the appropriate approval option; and the relationship of Section 4(f) with NEPA and other environment laws and regulations.

Outcomes
Upon completion of the course, participants will be able to:

• Explain the history and purpose of Section 4(f)
• Identify the agencies subject to Section 4(f) compliance
• Describe the applicability criteria for Section 4(f) properties
• Describe the relationship among Section 4(f), NEPA project development, and other environmental requirements
• Differentiate the roles and responsibilities of participants in the Section 4(f) process
• Apply the Section 4(f) decision-making process within transportation project development
• Describe what is necessary to document Section 4(f) compliance

Target Audience
State Departments of Transportation
FHWA Headquarters and Field staff, including Federal Lands
Consultants
Officials with jurisdiction of affected Section 4(f) resources, e.g. State Historic Preservation Offices, Tribal Historic Preservation Offices, park owners, etc.
Other Federal agencies involved with environmental resources
Local agencies, including project sponsors and transit agencies
Public/Special interest groups or Non-Governmental Organizations (NGOs)
Transportation Planning Partners
Tribes

Training Level: Basic

Fee: 2022: $500 Per Person; 2023: $770 Per Person

Length: 2 DAYS (CEU: 1.4 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142074

Course Title
Fundamentals of Environmental Justice

Fundamentals of Environmental Justice (WBT) explains how environmental justice, or EJ, applies to each stage of transportation decision making. The US Department of Transportation, or US DOT, and its partners are committed to integrating the principles of EJ and nondiscrimination into all Federal programs and activities. In this course, participants are presented with a variety of strategies and resources for considering EJ throughout the transportation decision-making process.

Outcomes
Upon completion of the course, participants will be able to:

• Describe the background of EJ as related to transportation and decision making.
• Identify definitions, principles, and benefits related to EJ.
• Describe the importance of public involvement in the transportation decision-making process.
• Describe EJ considerations in the transportation planning process.
• Describe EJ considerations in environmental review and design.
• Describe EJ considerations related to the right of way phase of transportation decision making.
• Identify EJ considerations during construction, operations, and maintenance.

Target Audience
The target audience consists of transportation practitioners (entry-level to senior-level) employed at a range of organizations, including State Departments of Transportation, Metropolitan Planning Organizations, local transportation agencies, and consulting firms. The typical learner may hold the following professional roles: data analyst, planner, project-development specialist, environmental specialist, civil rights specialist, consultant, or any other job function that may require knowledge of environmental justice and transportation. Also, those who interact with minority and/or low-income communities; provide community services; and elected officials and their representatives may benefit from this course.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 5 HOURS (CEU: .5 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Environmental Justice Analysis is a 2-day Instructor-led Training (ILT) course offered by NHI, the authoritative source in transportation training. The goal of this course is to increase knowledge and skills pertaining to the analysis associated with identifying and addressing disproportionately high and adverse effects of transportation programs, plans, projects, and activities on minority populations and low-income populations. This course provides participants with the information, tools, and data resources to perform EJ analysis activities to help ensure equitable transportation decision making and compliance with transportation planning regulations and NEPA. By accurately identifying communities, practitioners can better address potential adverse impacts to EJ communities and populations, and ensure they are meaningfully involved early and continually throughout the transportation decision-making process. This course provides participants with the procedural concepts, resources, and information to identify EJ populations; recognize potentially adverse impacts and/or benefits; develop and evaluate mitigation measures to address disproportionately high and adverse effects; and approaches for documenting findings and process. This course also provides participants with analysis tools and techniques to identify and address disproportionately high and adverse effects on minority populations and low-income populations during transportation planning and project development.

Throughout the course, participants will have opportunities to use scenarios and data to do the following: estimate spatial scope and magnitude of potential impacts; identify benefits of proposed actions; determine equitable distribution of benefits and burdens; and determine how to communicate findings and document methodology, results, and findings.

**OUTCOMES**

Upon completion of the course, participants will be able to:

- Identify the basis and importance of EJ analysis to improving decision-making processes.
- Describe how to perform an EJ analysis during transportation planning and project development using the EJ analysis framework and available data sources, tools, and strategies.
- Develop EJ analysis findings that ensure equitable transportation decision-making during transportation planning.
- Develop EJ analysis findings in the context of an environmental review to ensure compliance with EJ Executive Order 12898, U.S.DOT and FHWA EJ orders, and all other requirements relevant to the NEPA process.
- Identify emerging issues that may impact the analysis of EJ populations as part of transportation decision-making.

**TARGET AUDIENCE**

The target audience for this instructor-led training course includes transportation practitioners (entry-level, mid-level, and senior-level) who are employed at a range of organizations, including State Departments of Transportation (State DOTs), Metropolitan Planning Organizations (MPOs), local public agencies, and consulting firms. Participants should have at least a college-level education or higher and may hold the following professional roles: data analyst, planner, engineer, project development specialist, environmental specialist, civil rights specialist, consultant, or any other job function that may require knowledge of Environmental Justice (EJ) and transportation. Lastly, participants should have a basic understanding of EJ and transportation planning and project development.

**TRAINING LEVEL:** Intermediate

**FEE:** 2022: $500 Per Person; 2023: $650 Per Person

**LENGTH:** 2 DAYS (CEU: 1.2 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142076

Course Title
Achieving Appropriate Consideration in NEPA Decision making, An Advanced NEPA Seminar

This is a blended course consisting of an instructor-led training component and a web-based training component. The 2-day in-person instructor-led training is prefaced by a 2-hour asynchronous online training.

Achieving Appropriate Consideration in NEPA Decisionmaking is a highly interactive seminar-style course that is blended with a web-based preface. The preface to the 2-day instructor-led training (ILT) is a 2-hour asynchronous web-based training (WBT).

Achieving a final project decision that complies with NEPA that is reasonable, not arbitrary, and supported by the information gathered requires a large number of small-scale decisions. NEPA practitioners decide when to begin the NEPA process, determine information needs and available sources, recognize when sufficient information has been collected, decide how to adapt to changing circumstances, choose among methods of good communication, and assess risks of making one decision versus another amid complex issues, time constraints, and cost issues. Ultimately, NEPA reviewers must be able to successfully defend all the environmental process decisions for a project.

In this course, participants learn how to apply NEPA policies and decision making strategies to make better, more informed defensible project decisions. Participants learn how to apply principles of good decision making and use critical thinking techniques to help them make good decisions throughout the NEPA process.

Before the 2-day in person ILT, participants must complete the 2-hour online training preface which consists of a virtual classroom experience and four WBT modules. In the virtual classroom, participants will learn about each other and the course instructors, state their expectations for the course, and download useful resources. The WBT modules provide introductory course information; a NEPA refresher of NEPA provisions and processes; and an introduction to decision making, critical thinking, and key NEPA decisions.

During the 2-day ILT, participants will be challenged to analyze scenarios, identify the NEPA policies and processes involved, and evaluate the critical decision points. The ILT begins with a brief overview followed by a series of lessons that encourage active engagement in a seminar-style format to help participants develop, refine, and apply strategies for making good decisions in NEPA.

The course was developed in Spring 2021.

The course relies heavily on participant interaction, collaboration, and engagement. It incorporates large and small group discussions, question and answer sessions, activities, and scenarios.

The course materials consist of a participant workbook, job aids, and online resources.

There is no formal assessment for this course. To receive a course completion certificate, participants must bring their WBT completion certificate to the ILT and attend and participate in the ILT.

Outcomes

Upon completion of the course, participants will be able to:
• Identify the purpose and intent of the national policy that NEPA created for federal agencies
• Identify key decisions in the NEPA process for transportation projects
• Use the principles of good decision making
• Evaluate the effects of changing project circumstances on NEPA decision making
• Employ integrated coordination of NEPA and related laws and regulations
• Identify where case law fits into the NEPA process
• Determine whether integrated coordination, mutually beneficial collaboration, and effective communication among stakeholders has occurred
• Apply FHWA’s strategies for expediting project delivery and achieving environmental stewardship along with principles of effective scheduling in NEPA decision making
• Determine when sufficient information has been collected to take action and make informed decisions
• Describe the purposes and importance of documentation in the NEPA process
• Assess how to identify and reduce risk in decision making

TARGET AUDIENCE
The target audience for this course is experienced or accomplished environmental practitioners and project development managers with a minimum of five years working on transportation projects that address a variety of environmental compliance issues. Expected participants include staff from state departments of transportation (DOTs), local governments, tribal governments, federal and state agencies, and consultants. State DOT from states contemplating taking on NEPA responsibilities through assignment, or states already having NEPA assignment are strongly encouraged to attend.

TRAINING LEVEL: Accomplished

FEE: 2022: $500 Per Person; 2023: $750 Per Person

LENGTH: 2 DAYS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142077

Course Title
Basics of Public Involvement in Transportation Decision Making

Basics of Public Involvement in Transportation Decision Making is a 4-hour Web-based Training course offered by NHI, the authoritative source in transportation training.

Effectively engaging the public in transportation decisions can help build support for the project, which can promote cost savings by reducing project delays and improving the project delivery process. NHI-142077 Basics of Public Involvement in Transportation Decision Making provides transportation practitioners with the knowledge and tools needed to better engage the public in transportation decisions as well as meet Federal requirements for public involvement.

In this course, participants will discover the importance of public involvement in transportation decision making and become familiar with the broad range of strategies and techniques transportation practitioners can use to identify and engage the public in a meaningful way.

This course explores the relationship between public involvement and transportation decision making. It presents participants with an overview of Federal public involvement regulations and directives for transportation planning, programming, and project development, as well as a framework for engaging the public using a variety of approaches.

Outcomes
Upon completion of the course, participants will be able to:

• Identify the importance of public involvement
• Recall the background of public involvement
• Recall the requirements of public involvement
• Recognize the purpose and importance of participation and public engagement during the planning and NEPA processes
• Recall which members of the public are potential participants in the transportation decision-making process
• Choose how to tailor public involvement communication to engage a variety of constituents
• Identify effective public involvement techniques appropriate to a variety of situations
• Identify strategies for promoting participant interaction
• Identify how to solicit and use public feedback to inform transportation decision making
• Select evaluation strategies and methods that are suitable for determining the effectiveness of a public engagement plan
• Identify emerging trends and innovative approaches to public involvement

Target Audience
The target audience for this WBT course includes transportation practitioners from Federal, State, regional, and local agencies, particularly data analysts, planners, engineers, project development specialists, environmental specialists, civil rights specialists, consultants, and other professionals whose job function may require knowledge of public involvement to support transportation decision making.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 4 HOURS (CEU: .4 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142078

Course Title
Planning and Environment Linkages (PEL)

Planning and Environment Linkages (PEL) is a 2-day instructor-led training course offered by NHI, the authoritative source in transportation training.

Integrating PEL into the transportation planning and environment review processes promotes more informed decision-making and accelerated project delivery. Furthermore, several policies and authorities encourage the implementation of PEL.

The course emphasizes the following benefits of PEL: accelerate project delivery, development of purpose and need early in the planning process, elimination of unreasonable alternatives during the planning process, early and improved coordination with resource agencies and stakeholders, improved program and informed project decisions, less duplication and improve documentation, promotion of efficient and cost-effective solutions, earlier consideration of potential environmental effects, and enhanced consultation, coordination, and public involvement.

As a participant, you will learn and discuss why PEL has been a successful practice, the benefits of PEL, the points of interface between planning and environmental review processes, PEL approaches using authorities associated with planning and environmental review, informing, using, or adopting planning information in the environmental review process, general considerations for using any PEL approach, the processes for developing purpose and need during planning that can be used in NEPA, the process for screening and eliminating unreasonable alternatives during planning, the role of Consultation, Coordination, and Public Involvement in PEL, documentation in a PEL approach, and action strategies to advance PEL in your State or region.

Outcomes
Upon completion of the course, participants will be able to:

• Identify why PEL has been a successful practice for transportation practitioners.
• Describe how planning and environment review processes interface.
• Summarize how specific authorities and their requirements influence how States and MPOs approach PEL.
• Identify different approaches for PEL, their related flexibilities and how to transition this information into NEPA.
• Summarize how applying PEL in planning supports development of purpose and need for the environmental review process.
• Summarize how to use PEL in screening and eliminating unreasonable alternatives during planning.
• Describe how public involvement supports PEL.
• Summarize how documentation is essential to a PEL approach.
• Identify strategies to implement PEL and accelerate project delivery.

Target Audience
The target audience includes transportation practitioners employed at State Departments of Transportation (State DOTs), Resource Agencies, Metropolitan Planning Organizations (MPOs), and local public agencies, as well as the Federal Highway Administration (FHWA), Federal Transit Administration (FTA) and regulatory agencies with a role in NEPA permitting, approving, or mitigating potential impacts from transportation projects. Typical course participants have a college degree and work as an analyst, planner, project development specialist, environmental specialist, public involvement specialist, civil rights specialist, consultant, or any other position requiring knowledge of PEL.
TRAINING LEVEL: Intermediate

FEE: 2022: $500 Per Person; 2023: $530 Per Person

LENGTH: 2 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142078A

Course Title
Planning and Environment Linkages (PEL), without Implement PEL Activity

This course is a slightly shorter version of the 2-day instructor-led course, NHI-142078 Planning and Environment Linkages (PEL). Both courses are offered by NHI, the authoritative source in transportation training, and both focus on the integration of PEL into the transportation planning and environmental review process. However, NHI-142078 includes an additional activity to help practitioners identify strategies implement PEL in their State or region which is omitted in this course.

Integrating PEL into the transportation planning and environmental review process promotes more informed decision-making and accelerated project delivery. Furthermore, several policies and authorities encourage the implementation of PEL.

The course emphasizes the following benefits of PEL: accelerate project delivery, development of purpose and need early in the planning process, elimination of unreasonable alternatives during the planning process, early and improved coordination with resource agencies and stakeholders, improved program and informed project decisions, less duplication and improve documentation, promotion of efficient and cost-effective solutions, earlier consideration of potential environmental effects, and enhanced consultation, coordination, and public involvement.

As a participant you will learn and discuss why PEL has been a successful practice; the benefits of PEL; the points of interface between planning and environmental review processes; PEL approaches using authorities associated with planning and environmental review; informing, using, or adopting planning information in the environmental review process; general considerations for using any PEL approach; the processes for developing purpose and need during planning that can be used in NEPA; the process for screening and eliminating unreasonable alternatives during planning; the role of consultation, coordination, and public involvement in PEL; and documentation in a PEL approach.

Outcomes
Upon completion of the course, participants will be able to:

- Identify why PEL has been a successful practice for transportation practitioners.
- Describe how planning and environmental review processes interface.
- Summarize how specific authorities and their requirements influence how States and MPOs approach PEL.
- Identify different approaches for PEL, their related flexibilities and how to transition this information into NEPA.
- Summarize how applying PEL in planning supports development of purpose and need for the environmental review process.
- Summarize how to use PEL in screening and eliminating unreasonable alternatives during planning.
- Describe how public involvement supports PEL.
- Summarize how documentation is essential to a PEL approach.

Target Audience
The target audience includes transportation practitioners employed at State Departments of Transportation (State DOTs), Resource Agencies, Metropolitan Planning Organizations (MPOs), and local public agencies, as well as the Federal Highway Administration (FHWA), Federal Transit Administration (FTA) and regulatory agencies with a role in NEPA permitting, approving, or mitigating potential impacts from transportation projects. Typical course participants have a college degree and work as an analyst, planner, project development specialist, environmental specialist, public involvement specialist, civil rights specialist, consultant, or any other position requiring knowledge of PEL.
TRAINING LEVEL: Intermediate

FEE: 2022: $500 Per Person; 2023: $530 Per Person

LENGTH: 16 HOURS (CEU: 1 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Planning and Environment Linkages (PEL) (VIRTUAL DELIVERY)

Planning and Environment Linkages (PEL) is a 2-day instructor-led training course offered by NHI, the authoritative source in transportation training.

Integrating PEL into the transportation planning and environment review processes promotes more informed decision-making and accelerated project delivery. Furthermore, several policies and authorities encourage the implementation of PEL.

The course emphasizes the following benefits of PEL: accelerate project delivery, development of purpose and need early in the planning process, elimination of unreasonable alternatives during the planning process, early and improved coordination with resource agencies and stakeholders, improved program and informed project decisions, less duplication and improve documentation, promotion of efficient and cost-effective solutions, earlier consideration of potential environmental effects, and enhanced consultation, coordination, and public involvement.

As a participant, you will learn and discuss why PEL has been a successful practice, the benefits of PEL, the points of interface between planning and environmental review processes, PEL approaches using authorities associated with planning and environmental review, informing, using, or adopting planning information in the environmental review process, general considerations for using any PEL approach, the processes for developing purpose and need during planning that can be used in NEPA, the process for screening and eliminating unreasonable alternatives during planning, the role of Consultation, Coordination, and Public Involvement in PEL, documentation in a PEL approach, and action strategies to advance PEL in your State or region.

OUTCOMES

Upon completion of the course, participants will be able to:

- Identify why PEL has been a successful practice for transportation practitioners.
- Describe how planning and environment review processes interface.
- Summarize how specific authorities and their requirements influence how States and MPOs approach PEL.
- Identify different approaches for PEL, their related flexibilities and how to transition this information into NEPA.
- Summarize how applying PEL in planning supports development of purpose and need for the environmental review process.
- Summarize how to use PEL in screening and eliminating unreasonable alternatives during planning.
- Describe how public involvement supports PEL.
- Summarize how documentation is essential to a PEL approach.
- Identify strategies to implement PEL and accelerate project delivery.

TARGET AUDIENCE

The target audience includes transportation practitioners employed at State Departments of Transportation (State DOTs), Resource Agencies, Metropolitan Planning Organizations (MPOs), and local public agencies, as well as the Federal Highway Administration (FHWA), Federal Transit Administration (FTA) and regulatory agencies with a role in NEPA permitting, approving, or mitigating potential impacts from transportation projects. Typical course participants have a college degree and work as an analyst, planner, project development specialist, environmental specialist, public involvement specialist, civil rights specialist, consultant, or any other position requiring knowledge of PEL.
TRAINING LEVEL: Intermediate

FEE: 2022: $450 Per Person; 2023: $530 Per Person

LENGTH: 12 HOURS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142080

Course Title
Bicycle Facility Design

This course has been approved by the American Planning Association for 0.8 credits toward American Institute of Certified Planners (AICP) maintenance.

Bicycle Facility Design is a Web-based Training course offered by NHI, the authoritative source in transportation training. To plan, design, and implement multimodal projects that improve safety for everyone, meet the needs of bicyclists of all ages and abilities, and contribute to the development of safe, comfortable, and connected bicycle networks, practitioners need a comprehensive understanding of bikeway design concepts and considerations.

This course helps practitioners deliver high-quality, safe, multimodal projects efficiently and effectively by delivering critical planning and design information.

This course covers principles of bicyclist safety, comfort, and connectivity, selection of bikeway type and associated design considerations, and national planning and design resources.

Outcomes
Upon completion of the course, participants will be able to:

- Reference existing national planning and design resources that inform the planning, design, and implementation of multimodal transportation projects.
- Identify principles of bicyclist safety, comfort, and connectivity as part of the transportation planning process.
- Select the appropriate bikeway type based on, and in context of, various factors.
- Identify key design considerations for each facility type.

Target Audience
Primary audiences include practitioners at State Departments of Transportation (DOTs), local governments, and Metropolitan Planning Organizations that are planning, designing, and implementing transportation projects. This includes, but is not limited to, practitioners that focus on bicycle planning and design, for example State DOT Pedestrian and Bicycle Coordinators and FHWA Pedestrian and Bicycle Points of Contact. Secondary audiences include general transportation planners, advocates, and other stakeholders that are engaged in the transportation planning process and that need a baseline of bicycle design information to make informed decisions.

Training Level: Intermediate

Fee: 2022: $50 Per Person; 2023: $0 Per Person

Length: 8 Hours (CEU: .8 Units)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142081

Course Title
Understanding Past, Current and Future Climate Conditions

The goal of this course is to provide an introduction to future projections of precipitation, temperature, and sea levels, basic scientific principles, and an overview of potential impacts of these changes on transportation facilities.

Outcomes
Upon completion of the course, participants will be able to:
• Recognize the basic science regarding changes in environmental conditions.
• Analyze how future environmental conditions could affect roads, bridges or other transportation infrastructure.

Target Audience
The target audiences for the course will be primarily staff who work in engineering, design, and project development/NEPA units in transportation agencies (mainly state DOTs). The course will also be relevant to those interested in planning, asset management, operations, and maintenance. Expected participants include experienced staff from state DOTs, local governments, Tribal governments, Federal State agencies, and consultants.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 2 Hours (CEU: .2 Units)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142082

Course Title
Introduction to Temperature and Precipitation Projections

The goal of this course is to describe the methods and tools that are used to produce temperature and precipitation projections that can be used for project development purposes. Participants will understand how to develop projections tailored to transportation agencies and gain an understanding of the associated limitations and uncertainties in the projection process.

Outcomes
Upon completion of the course, participants will be able to:

• Describe why it's important to consider climate projections in transportation planning and design
• Identify data sources for future conditions (temperature, precipitation) for locations in a project or study area
• Recall uncertainties associated with climate projections and weather data

Target Audience
The target audience for the course will be primarily staff who work in engineering, design, and project development/NEPA units in transportation agencies (mainly state DOTs). The course will also be relevant to those interested in planning, asset management, operations, and maintenance. Expected participants include experienced staff from state DOTs, local governments, Tribal governments, Federal State agencies, and consultants.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 1 HOURS (CEU: .1 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142083

Course Title
Systems Level Vulnerability Assessments

The goal of this course is to introduce participants to the concept of vulnerability as used to understand extreme weather impacts on roadway infrastructure. Information will be provided on the purpose of systems level vulnerability assessments and how the results can be used, including as a step toward project level assessment. Different techniques for undertaking these assessments will be introduced and their pros and cons discussed.

Outcomes
Upon completion of the course, participants will be able to:

- Recognize how future environmental conditions could affect roads, bridges, and other transportation infrastructure
- Identify a range of analysis methods for conducting systems-level vulnerability assessments of highway infrastructure
- Identify uses of systems-level vulnerability assessment results

Target Audience
The target audience for the course will be primarily staff who work in engineering, design, and project development/NEPA units in transportation agencies (mainly state DOTs). The courses will also be relevant to those interested in planning, asset management, operations, and maintenance. Expected participants include experienced staff from state DOTs, local governments, Tribal governments, Federal State agencies, and consultants.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 2 HOURS (CEU: .2 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-142084

COURSE TITLE
Adaptation Analysis for Project Decision Making

The goal of this course is to introduce participants to a process for conducting facility-level adaptation assessments. This will include understanding the purpose of facility-level assessments as part of an overall project development process. Participants will be introduced to risk-based approaches to evaluate the cost-effectiveness of adaptation options under different scenarios and how this can be used to inform the selection of an adaptation strategy.

OUTCOMES
Upon completion of the course, participants will be able to:

• Identify entry points for addressing resilience in the project development process
• Describe key steps to develop an appropriate adaptation alternative for a specific asset or project
• Describe how to select the most appropriate adaptation alternative for a specific asset or project

TARGET AUDIENCE
The target audience for the course will be primarily staff who work in engineering, design, and project development/NEPA units in transportation agencies (mainly state DOTs). The course will also be relevant to those interested in planning, asset management, operations, and maintenance. Expected participants include experienced staff from state DOTs, local governments, Tribal governments, Federal State agencies, and consultants.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person
LENGTH: 2 HOURS (CEU: .2 UNITS)
CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-142085

COURSE TITLE
Addressing Climate Resilience in Highway Project Development and Preliminary Design

FHWA-NHI-142085 is a two-day course, that does not include the lesson on Coastal Hydraulics. FHWA-NHI-142085A is a three-day course that does include the lesson on Coastal Hydraulics.

The goal of the ILT course is to introduce participants to project-level adaptation assessment; providing participants with information and an understanding of which projects should be considered for resilience analysis with more in-depth engineering analysis. This course is intended to be a hands-on course where participants learn how those involved with project development can incorporate resilience concepts into engineering analysis and the identification of appropriate resilience strategies. This course also identifies potential linkages between adaptive project development and environmental processes.

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe the steps and model approaches in projecting future environmental conditions.

• Demonstrate the use of data sources on future environmental conditions (temperatures, precipitation, sea levels) for locations in a project or study area.

• Analyze how future environmental conditions could affect roads, bridges or other transportation infrastructure.

• Identify a range of analysis methods for assessing future impacts of sea level rise, flooding and temporary inundation, high or low temperatures, and drought conditions on highway infrastructure (e.g., roads, bridges, pavement drainage, slope stability, etc.)

• Identify entry points for addressing resilience in the project development and preliminary design processes.

TARGET AUDIENCE
The target audiences for the courses will be primarily staff who work in engineering, design, and project development/NEPA units in transportation agencies (mainly state DOTs). The courses will also be relevant to those interested in planning, asset management, operations, and maintenance. Expected participants include experienced staff from state DOTs, local governments, Tribal governments, Federal State agencies, and consultants.

TRAINING LEVEL: Intermediate

FEE: 2022: $700 Per Person; 2023: $700 Per Person

LENGTH: 2.5 DAYS (CEU: 1.5 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-142085A

COURSE TITLE
Addressing Climate Resilience in Highway Project Development and Preliminary Design

FHWA-NHI-142085A is a three-day course that does include the lesson on Coastal Hydraulics. FHWA-NHI-142085 is a two-day course, that does not include the lesson on Coastal Hydraulics.

The goal of the ILT course is to introduce participants to project-level adaptation assessment; providing participants with information and an understanding of which projects should be considered for resilience analysis with more in-depth engineering analysis. This course is intended to be a hands-on course where participants learn how those involved with project development can incorporate resilience concepts into engineering analysis and the identification of appropriate resilience strategies. This course also identifies potential linkages between adaptive project development and environmental processes.

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe the steps and model approaches in projecting future environmental conditions.
• Demonstrate the use of data sources on future environmental conditions (temperatures, precipitation, sea levels) for locations in a project or study area.
• Analyze how future environmental conditions could affect roads, bridges or other transportation infrastructure.
• Identify a range of methods for assessing sea level rise, flooding, and temporary inundation, high or low temperatures, and drought conditions on highway infrastructure (e.g., roads, bridges, pavement drainage, slope stability, etc.)
• Identify entry points for addressing resilience in the project development and preliminary design processes.
• Identify the most appropriate option from a range of adaptation options including adaptive management.

TARGET AUDIENCE
The target audiences for the courses will be primarily staff who work in engineering, design, and project development/NEPA units in transportation agencies (mainly state DOTs). The courses will also be relevant to those interested in planning, asset management, operations, and maintenance. Expected participants include experienced staff from state DOTs, local governments, Tribal governments, Federal State agencies, and consultants.

TRAINING LEVEL: Intermediate

FEE: 2022: $700 Per Person; 2023: $700 Per Person

LENGTH: 3 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142086

Course Title
Acoustics of Highway Traffic and Construction Noise

The goal of this course series is to help learners understand the regulations, foundational scientific concepts, and processes associated with performing highway noise studies that lead to design and construction. The courses in this series provide an overview of highway traffic and construction noise based upon and focused on the FHWA's 23 CFR 772.

The modules in this course present participants with content that includes the basic principles of acoustics:
- Basic Principles of Sound and Noise
- Frequency and Octaves
- Magnitude and Amplitude
- Time Variance
- Sound Level Descriptors
- Propagation
- Noise Barriers

Outcomes
Upon completion of the course, participants will be able to:
- Identify the characteristics of sound and noise.
- Determine how to measure noise and amplitude for common noises using decibel addition and summing multiple equal sound levels.
- Identify how frequency, wavelength, and octaves impact how humans respond to sound.
- Recognize why sound duration and variation matter to the receptor.
- Identify how to select sound level descriptors for a noise study.
- Identify the various components of sound propagation including point and line source convergence, ground attenuation, atmospheric effects, and shielding.
- Select the best noise barrier for the given scenario.

Target Audience
State Department of Transportation (DOT) staff responsible for project development and review, consultants conducting or reviewing noise studies, and FHWA staff responsible for project oversite. The course is designed not just for those performing noise analyses, but also for those responsible for the review and approval of noise studies and incorporating the results of these studies into design and environmental documents.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 2 HOURS (CEU: .2 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142087

Course Title
Highway Traffic and Construction Noise Regulations

The goal of this course series is to help learners understand the regulations, foundational scientific concepts, and processes associated with performing highway noise studies that lead to design and construction. The courses in this series provide an overview of highway traffic and construction noise based upon and focused on the FHWA’s 23 CFR 772.

The modules in this course provide an overview of legislation, regulations, and policies that apply to highway traffic noise and include:

Noise Legislation, Regulation, and Policy
23 CFR 772
Project Types
Impacts and Land Use Categories
Feasibility
Reasonableness
Construction Noise

Outcomes
Upon completion of the course, participants will be able to:

• List key federal laws that apply to highway traffic noise.
• Explain 23 CFR 772 in relation to highway projects.
• Distinguish between which projects are categorized as Type I, Type II, and Type III.
• Explain highway traffic noise impacts and noise abatement criteria for land use and activity categories.
• Recognize what factors to consider before making feasibility determinations.
• Describe what factors to consider when making a reasonableness determination.
• Explain federal regulations that cover highway construction noise and abatement measures for construction equipment and activities.

Target Audience
State Department of Transportation (DOT) staff responsible for project development and review, consultants conducting or reviewing noise studies, and FHWA staff responsible for project oversite. The course is designed not just for those performing noise analyses, but also for those responsible for the review and approval of noise studies and incorporating the results of these studies into design and environmental documents.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 2 Hours (CEU: .2 Units)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-142088

COURSE TITLE
How to Measure Highway Traffic Noise

The goal of this course series is to help learners understand the regulations, foundational scientific concepts, and processes associated with performing highway noise studies that lead to design and construction. The courses in this series provide an overview of highway traffic and construction noise based upon and focused on the FHWA's 23 CFR 772.

The modules in this course focus on noise measurement and include:

Basic Concepts and Resources
Field Instrumentation
Planning and Execution
Site Selection and Sampling Periods
Documentation
Multimodal Projects

OUTCOMES
Upon completion of the course, participants will be able to:

• Identify the key elements in a noise measurement study
• Recognize key considerations for noise measurement procedures including documentation and equipment.
• Recognize how to select a site and sampling periods for a noise measurement study.
• Recognize what constitutes good documentation in a noise study, including noise measurement, procedures, and components of measurement.
• Identify how to conduct a multimodal project noise measurement study including available documents, noise source and level determinations, noise source accountability, and commonly used tools.

TARGET AUDIENCE
State Department of Transportation (DOT) staff responsible for project development and review, consultants conducting or reviewing noise studies, and FHWA staff responsible for project oversight. The course is designed not just for those performing noise analyses, but also for those responsible for the review and approval of noise studies and incorporating the results of these studies into design and environmental documents.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 2 HOURS (CEU: .2 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-142089

COURSE TITLE
Abatement and Design Considerations for Highway Traffic Noise

The goal of this course series is to help learners understand the regulations, foundational scientific concepts, and processes associated with performing highway noise studies that lead to design and construction. The courses in this series provide an overview of highway traffic and construction noise based upon and focused on the FHWA’s 23 CFR 772.

The modules in this course focus on operational noise abatement including:

Non-Barrier Abatement Methods
Barrier Methods - Noise Walls
Barrier Methods - Berms
Structure Mounted Noise Walls
Special Features for Walls
Wall Materials
Multimodal Projects

OUTCOMES
Upon completion of the course, participants will be able to:

• Given a scenario, select the best Federally eligible non-barrier noise abatement technique.
• Identify non-acoustical factors to consider when designing noise walls.
• Identify non-acoustical considerations to make when designing ground- or structure-mounted noise barriers.
• Identify non-acoustical considerations for structure-mounted noise walls.
• Identify non-acoustical considerations when choosing noise wall material types.
• Identify special acoustical and non-acoustical noise barrier features including design considerations.
• Identify non-acoustical considerations to make when designing barrier berms including the issues and benefits of berms.
• Identify noise abatement options and considerations for multimodal projects.

TARGET AUDIENCE
State Department of Transportation (DOT) staff responsible for project development and review, consultants conducting or reviewing noise studies, and FHWA staff responsible for project oversite. The course is designed not just for those performing noise analyses, but also for those responsible for the review and approval of noise studies and incorporating the results of these studies into design and environmental documents.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 2 HOURS (CEU: .2 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-142090

COURSE TITLE
An Introduction to the Traffic Noise Model (TNM) 3.0

The modules in this course focus on TNM modeling and include:

Overview of TNM
Noise Studies & Type I and Type II Projects
Use of Noise Analysis Areas
Inputs & Roadways
Inputs & Traffic
Inputs & Paths and Receivers
Non-Residential Receptor Analysis
Basic Barrier Design Considerations

OUTCOMES
Upon completion of the course, participants will be able to:

• Identify the components of the TNM.
• Identify the phases of a noise study for Type 1 and Type 2 projects.
• Identify the input data objects for roadways.
• Identify the basic traffic modeling parameters including modeling considerations for highway traffic input.
• Identify the minimum parameters, data requirements, modeling aids, data objects, and structures for traffic models.
• Identify how to create noise analysis areas including when to create noise sensitive areas or noise analysis areas.
• Identify how to assign receptors to various non-residential land uses including implications related to feasibility and reasonableness and modeling considerations.
• Identify barrier design considerations including acoustical principles, issues, and criteria related to noise barrier and perturbable barrier analysis and design.
• Identify what outputs to use to report required information.
• Identify how to model within the Low Volume Road Noise Calculation Tool (LVRT).

TARGET AUDIENCE
State Department of Transportation (DOT) staff responsible for project development and review, consultants conducting or reviewing noise studies, and FHWA staff responsible for project oversite. The course is designed not just for those performing noise analyses, but also for those responsible for the review and approval of noise studies and incorporating the results of these studies into design and environmental documents.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person
LENGTH: 3 HOURS (CEU: .3 UNITS)
CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142091

Course Title
Public Involvement for Highway Traffic and Construction Noise Projects

The goal of this course series is to help learners understand the regulations, foundational scientific concepts, and processes associated with performing highway noise studies that lead to design and construction. The courses in this series provide an overview of highway traffic and construction noise based upon and focused on the FHWA's 23 CFR 772.

The modules in this course focus on public involvement as it relates to noise projects including:
- Overview of Public Involvement Programs
- Best Practices
- Roles and Responsibilities
- Tasks by Project Phases

To learn more about public involvement techniques and best practices, participants should explore NHI course 142077.

Outcomes
Upon completion of the course, participants will be able to:
- Identify the regulations related to public involvement in noise projects.
- Identify best practices for increasing public involvement in noise projects including identifying who should receive information, what information should be distributed, where meetings should occur, and how to present related information.
- Identify public involvement roles and responsibilities related to highway traffic and construction noise at each stage of project development.
- Identify ways that public involvement impacts each project phase.

Target Audience
State Department of Transportation (DOT) staff responsible for project development and review, consultants conducting or reviewing noise studies, and FHWA staff responsible for project oversite. The course is designed not just for those performing noise analyses, but also for those responsible for the review and approval of noise studies and incorporating the results of these studies into design and environmental documents.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 1 HOURS (CEU: .1 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-142092

COURSE TITLE
How to Mitigate Construction Noise

The goal of this course series is to help learners understand the regulations, foundational scientific concepts, and processes associated with performing highway noise studies that lead to design and construction. The courses in this series provide an overview of highway traffic and construction noise based upon and focused on the FHWA's 23 CFR 772.

The modules in this course focus on construction noise including evaluation and abatement techniques.

Construction Noise - Evaluation
Construction Noise - Abatement Techniques

OUTCOMES
Upon completion of the course, participants will be able to:
• Identify how to evaluate construction noise on projects.
• Determine what type of noise abatement techniques should be used based on influencing factors.

TARGET AUDIENCE
State Department of Transportation (DOT) staff responsible for project development and review, consultants conducting or reviewing noise studies, and FHWA staff responsible for project oversite. The course is designed not just for those performing noise analyses, but also for those responsible for the review and approval of noise studies and incorporating the results of these studies into design and environmental documents.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person
LENGTH: 1 HOURS (CEU: .1 UNITS)
CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142093

Course Title
How to Document Highway Traffic Noise Study Results

The goal of this course series is to help learners understand the regulations, foundational scientific concepts, and processes associated with performing highway noise studies that lead to design and construction. The courses in this series provide an overview of highway traffic and construction noise based upon and focused on the FHWA's 23 CFR 772.

The modules in this course focus on documenting alternative contracting methods, requirements, study tasks, and technical reporting.

Noise Study Reports
Environmental Documents
Alternative Delivery Projects

Outcomes
Upon completion of the course, participants will be able to:

• Identify the components of technical reports for noise studies.
• Identify noise study reporting requirements related to environmental documents.
• Identify how to conduct noise studies for alternative delivery projects.

Target Audience
State Department of Transportation (DOT) staff responsible for project development and review, consultants conducting or reviewing noise studies, and FHWA staff responsible for project oversite. The course is designed not just for those performing noise analyses, but also for those responsible for the review and approval of noise studies and incorporating the results of these studies into design and environmental documents.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 1 Hours (CEU: .1 Units)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142094

Course Title
Noise Compatible Planning (NCP) for Highway Traffic Noise

The goal of this course series is to help learners understand the regulations, foundational scientific concepts, and processes associated with performing highway noise studies that lead to design and construction. The courses in this series provide an overview of highway traffic and construction noise based upon and focused on the FHWA’s 23 CFR 772.

The modules in this course focus on the role of the highway agency, the role of those outside the highway agency, administrative techniques, and physical techniques.

Overview and Available Resources

Physical Techniques
Administrative Techniques
Roles and Responsibilities

Outcomes

Upon completion of the course, participants will be able to:

- Identify the considerations for noise compatible planning.
- Identify physical techniques associated with noise compatible planning.
- Identify administrative noise compatible planning techniques that local agencies should consider.
- Identify stakeholder responsibilities and techniques for noise abatement and control at the source, along the path and at the receptor.

Target Audience

State Department of Transportation (DOT) staff responsible for project development and review, consultants conducting or reviewing noise studies, and FHWA staff responsible for project oversight. The course is designed not just for those performing noise analyses, but also for those responsible for the review and approval of noise studies and incorporating the results of these studies into design and environmental documents.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 2 HOURS (CEU: .2 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-151050

Course Title
Traffic Monitoring Programs: Guidance and Procedures

Participants are encouraged to bring their own copy of the FHWA Traffic Monitoring Guide 2016 and a calculator. The training room must be large enough to allow for group exercises, as well as room to display local traffic data collection equipment.

Additionally, the FHWA Office of Highway Policy Information offers a complimentary presentation of the Travel Monitoring Analysis System (TMAS) in conjunction with this training course. Please contact Steven Jessberger (Steven.Jessberger@dot.gov) for more information.

Developed in conjunction with the 5th revision of the FHWA Traffic Monitoring Guide (TMG 2016), this course replaces NHI 151018 and offers guidance on how to manage a successful traffic monitoring program. The training begins with an overview of Federal traffic monitoring regulations and a presentation of the host State's traffic monitoring program. Subsequent lessons introduce federal guidance, best practices, and recommended procedures for developing a data collection framework for traffic volume, speed, classification, weight, and non-motorized programs. The course also incorporates related traffic monitoring elements of transportation management and operations, traffic data needs and uses, traffic data submittal requirements, and relevant traffic monitoring research. The critical importance of quality data collection is emphasized to support project planning, programming, design, and maintenance decisions-- all of which affect the Nation's transportation network.

Outcomes
Upon completion of the course, participants will be able to:

• Describe the appropriate use of the TMG
• Describe the TMG procedures for obtaining traffic monitoring data for Federal and State programs
• Explain how to apply traffic monitoring data to answer specific questions on Federal and State issues
• Explain traffic data reporting requirements
• Explain the value of cooperative and multi-disciplinary approaches to traffic monitoring programs

Target Audience
This Instructor-led training (ILT) course is designed for transportation professionals involved in traffic monitoring programs. Primarily intended for FHWA and State DOT staff, this training is also relevant to regional and local government staff, as well as others whose roles include development and/or oversight of traffic monitoring programs. There are no course pre-requisites or assumed pre-training competencies.

Training Level: Basic

Fee: 2022: $350 Per Person; 2023: $350 Per Person

Length: 2 DAYS (CEU: 1.4 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-138007

COURSE TITLE
Performance-based Planning and Programming

YOU CAN PREVIEW A SUMMARY OF THIS COURSE BY COPYING AND PASTING THE FOLLOWING URL: https://connectdot.connectsolutions.com/nhi138007executivesummary/

‘Performance-based Planning and Programming’ is a two-day Instructor-led Training course offered by NHI, the authoritative source in transportation training.

As recent economic, political, and social trends have placed greater emphasis on public sector accountability and cost-effectiveness, many transportation agencies across the country have begun to shift towards a performance-based approach to plan, manage, and operate their systems. This course will familiarize transportation agencies with the key elements of a performance-based planning and programming (PBPP) framework, the relationship of these elements within existing planning and programming processes, and the connection of these elements to Transportation Performance Management (TPM) requirements initiated by legislation, including the Moving Ahead for Progress in the 21st Century (MAP-21) Act and continued under the Fixing America’s Surface Transportation (FAST) Act and the Statewide and Nonmetropolitan Transportation Planning; Metropolitan Transportation Planning Final Rule, which was published in the Federal Register on May 27, 2016.

This course begins by providing an overview of PBPP and then walks the participants through each element of the US Department of Transportation (USDOT) PBPP framework, providing examples of alternative approaches and real-world applications.

Participants in the course will gain insight on several key learning points, including:
+ How to apply performance management principles within the planning and programming process to achieve desired agency goals and performance outcomes
+ How to connect PBPP with other performance management activities, plans, and products
+ How to assess and learn from transferable planning and programming practices in use across the US, including examples of how agencies are moving towards implementing PBPP

This course includes a written assessment. The course content was last updated in July 2017.

YOU CAN PREVIEW A SUMMARY OF THIS COURSE BY COPYING AND PASTING THE FOLLOWING URL: https://connectdot.connectsolutions.com/nhi138007executivesummary/

To enroll in this Instructor-led Training course, select the ‘View Sessions’ button and select ‘Add To Cart’ next to your session choice. If there are no upcoming sessions, select ‘Sign Up for Session Alerts.’

Any organization can host this course. To host this course and bring training to your organization, click the ‘Host this Course’ button.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe requirements for performance-based planning and programming.
• Describe the elements of the performance-based planning and programming framework.
• Describe how the performance-based planning and programming framework relates to the TPM requirements.
• Describe opportunities to engage the public in a performance-based planning and programming process.
• Explain how to integrate various performance-based plans using data and information contained within those plans.
• Recognize the role of coordination in developing performance-based plans.

TARGET AUDIENCE
The target audience for this Instructor-led Training course primarily includes transportation professionals responsible for developing and implementing performance-based plans and programs, and those responsible for integration and linkage of other requirements, under performance-based legislation initiated by MAP-21 and continued under FAST. This includes a broad audience of State DOTs, MPOs, regional planning organizations (RPOs), transit agencies, and USDOT staff. Participants should have knowledge of the planning process.
TRAINING LEVEL: Basic

FEE: 2022: $500 Per Person; 2023: $500 Per Person

LENGTH: 2 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Effective Target Setting for Transportation Performance Management

YOU CAN PREVIEW A SUMMARY OF THIS COURSE BY COPYING AND PASTING THE FOLLOWING URL: https://connectdot.connectsolutions.com/nhi138012executivesummary/

‘Effective Target Setting for Transportation Performance Management’ is a 2-day Instructor-led Training (ILT) course offered by NHI, the authoritative source in transportation training.

Transportation agencies have been moving toward a performance-based management approach for over a decade. The passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) Act further emphasized the importance of target setting within a performance management context. MAP-21 requires State Departments of Transportation (State DOTs), Metropolitan Planning Organizations (MPOs), and public transit providers to set performance targets for the United States Department of Transportation’s (USDOT’s) established national performance measures.

It is anticipated that performance management principles will carry forward in subsequent legislation as it has been shown to be good business practice and has been supported by the United States Government Accountability Office (GAO). While FHWA and most State DOTs and MPOs have experience with developing performance measures and reporting on condition/performance, experience is much more limited in setting performance targets and reporting on the achievement (or not) of those targets. Understanding and applying targets within a Transportation Performance Management (TPM) program is a critical component of TPM.

This course will provide the information needed on how to establish and use performance targets. The course will answer these broad questions: What is a target?, Why should I set targets?, How do I set targets?, How do I use targets? The focus of this training will be at the State/MPO level. Federal employees will learn about their role in the context of States/MPOs going through the target setting steps.

This course includes a written assessment. The course content was last updated in October 2017.

YOU CAN PREVIEW A SUMMARY OF THIS COURSE BY COPYING AND PASTING THE FOLLOWING URL: https://connectdot.connectsolutions.com/nhi138012executivesummary/

To enroll in this Instructor-led Training course, click the ‘View Sessions’ button and click ‘Add To Cart’ next to your session choice. If there are no upcoming sessions, click ‘Sign Up for Session Alerts.’

Any organization can host this course. To host this course and bring training to your organization, click the ‘Host this Course’ button.

OUTCOMES

Upon completion of the course, participants will be able to:

• Explain the value of setting appropriate and effective targets as part of performance management and within the context of current legislation
• Describe what a target is and the importance of establishing a baseline
• Explain the importance of collaboration in the target setting process and in the context of current legislation
• Explain the key steps to set an effective target
• Explain the factors involved in setting targets
• Explain how trade-offs should be considered in determining targets between system performance areas
• Set a target
• Identify coordination needs in target setting
• Identify key stakeholder roles
• Identify key components of effective condition/performance tracking and progress assessment
• Identify strategies to communicate target data and information effectively
• Identify mitigation strategies for challenges related to target setting

TARGET AUDIENCE
The target audience for this Instructor-led Training course includes the following: + Technical roles responsible for setting targets + Planning/programming staff who develop the Statewide Transportation Improvement Plan (STIP) and Regional Transportation Improvement Plans (RTIPs) + Staff dedicated to performance management + Individuals who will be involved in coordination/collaboration of target setting + Federal Highway Administration/Division Office employees and FTA employees who provide oversight for and assistance with target setting, including Performance and Management Analysts (PMAs) and subject area specialists who will assist their state and local partners A secondary target audience for this training includes higher-level decision makers who will ultimately decide on which targets to use.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $500 Per Person; 2023: $500 Per Person

**LENGTH:** 2 DAYS (CEU: 1.2 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-139006

Course Title
Integrating Freight into Transportation Decision Making

This course will be free of charge for the remainder of 2021.

Freight transportation issues can be complex and involve many different stakeholders, all of whom have different perspectives on the freight transportation system. The challenge faced by many public-sector transportation professionals is how to best incorporate these freight perspectives into the transportation decision-making process in a way that results in a safe and efficient transportation system for both people and goods. This Web-based training course will provide a greater understanding of freight trends, its stakeholders, and its issues, so that public-sector transportation professionals are better able to incorporate freight into their respective transportation processes and programs.

It is recommended that you take this course before other Freight courses.

Outcomes
Upon completion of the course, participants will be able to:

• Identify the stakeholders involved in freight transportation
• Explain the role of different modes in freight transportation
• Describe some trends affecting freight transportation, and their impact on the transportation system and communities
• Discuss some of the common issues that prevent freight from being fully incorporated into the transportation decision-making process
• Identify key resources to help guide statewide and metropolitan freight planning effort
• Determine the impact and reach of decisions on freight during the transportation decision-making process

Target Audience
The target audience for this course is comprised of staff from a broad range of agencies (FHWA, MPOs, State DOTs, local jurisdictions, AMPO, NARC, NADO, AASHTO, as well as other State and regional agencies) who must take freight into account in their transportation decision-making processes.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 6 HOURS (CEU: .6 UNITS)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-141045

COURSE TITLE
Real Estate Acquisition under the Uniform Act: An Overview - WEB-BASED

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act) is the basis for Federally-funded real estate acquisition programs. This self-paced training provides an overview of the Uniform Act’s three key elements: valuation, acquisition, and relocation. This course underscores the importance of following Uniform Act requirements when acquiring property for a Federally-funded transportation project.

OUTCOMES
Upon completion of the course, participants will be able to:

• Provide a basic overview of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act)
• Discuss the three key elements of the Uniform Act: valuation/appraisal, acquisition and relocation
• Explain how to develop an estimate of just compensation using the appraisal process or appraisal waiver procedure(s)
• Identify relocation benefits and services required by the Uniform Act
• List places to obtain relevant resource documents and materials

TARGET AUDIENCE
Federal, State, and local government employees and consultants who acquire real estate for Federally-funded transportation projects. This includes acquisition and relocation agents; program or project managers; grant administrators or grant recipients; appraisers, realty specialists, attorneys, engineers, planners, and others involved with real property acquisition.

TRAINING LEVEL: Basic
FEE: 2022: $0 Per Person; 2023: $0 Per Person
LENGTH: 6 HOURS (CEU: 0 UNITS)
CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-141052

COURSE TITLE
Successful Acquisition under the Uniform Act
This course will provide the knowledge and skills that a public agency negotiator needs to complete acquisitions that comply with the Uniform Act.

OUTCOMES
Upon completion of the course, participants will be able to:
• Explain the legal basis for land acquisition by a governmental entity
• Identify the pre-acquisition materials necessary for property acquisition
• Explain the basics of the valuation process
• Describe the acquisition process under the Uniform Act
• Formulate effective negotiation skills, using best practices
• Discuss legal aspects of real property acquisition
• Discuss the role and limitations of consultants in the acquisition process

TARGET AUDIENCE
Federal, State, and local public agencies, FHWA personnel, contractors, and other interested persons.

TRAINING LEVEL: Basic

FEE: 2022: $800 Per Person; 2023: $800 Per Person

LENGTH: 3 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-142036

COURSE TITLE
Public Involvement in the Transportation Decision making Process

Public involvement is much more than public hearings. It involves creative thinking as well as the willingness and ability to interact openly and sensitively to the public’s preferred forms of communication and participation. Public involvement is about reaching out to and involving the public in transportation decisionmaking. The public should have a role in every phase of decisionmaking, including the design of the participation plan itself. Successful public involvement addresses the public’s procedural, psychological, and substantive needs while gathering useful information. By focusing on interests—rather than positions—public involvement can become more meaningful as well as useful.

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe U.S. DOT transportation decisionmaking processes, including those that trigger the National Environmental Policy Act
• Describe the relationship between public involvement and decisionmaking
• Develop a public involvement plan with stakeholder assistance that includes attention to non-traditional populations as an evaluation component
• Describe interest-based problem solving and the values that underlie it
• Identify ways to enhance public involvement plans

TARGET AUDIENCE
Federal, State, and local transportation agency staff, metropolitan planning organization personnel, transit operators, consultants, and others who are responsible for planning, implementing, or participating in any phase of the public involvement process.

TRAINING LEVEL: Basic

FEE: 2022: $500 Per Person; 2023: $755 Per Person
LENGTH: 3 DAYS (CEU: 1.8 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142068

Course Title
Air Quality Planning: Clean Air Act Overview - WEB-BASED

The purpose of this training is to provide participants with an overview of air quality planning, including requirements, processes, interactions with and implications for, transportation planning and project development.

This is the first in a future series of air quality Web-based trainings (WBTs):
142068: Clear Air Act Overview
142069: SIP and TCM Requirements and Policies
142070: SIP Development Process
142071: Transportation Conformity

Outcomes
Upon completion of the course, participants will be able to:
• Define the purpose of the Clean Air Act
• Describe the 1990 Clean Air Act Amendments
• Identify and explain Clean Air Act Amendment provisions relevant to transportation
• Recognize impacts of Clean Air Act

Target Audience
The target audience for the Air Quality Series is transportation and air quality planners and engineers from State and local departments of transportation (DOT), metropolitan planning organizations (MPO), transit agencies, Federal agencies (Federal Highway Administration, Federal Transit Administration, U.S. Environmental Protection Agency, U.S. Department of Energy, etc.), and State and local environmental agencies. Others include transportation and environmental consultants, public officials and staff members, community and interest groups, as well as other stakeholders in the planning process.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person
Length: 1.5 HOURS (CEU: 0 UNITS)
Class Size: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142069

Course Title
Air Quality Planning: SIP and TCM Requirements and Policies - WEB-BASED

This course covers the different types of SIPs and key CAA SIP requirements general to all SIPs and specific to ozone, CO and PM SIPs; discusses how the EPA processes SIPs; explores the key features of EPA SIP policies and how they differ from CAA requirements; and explains RACM and how it applies to TCMs.

This is the second in a future series of air quality Web-based trainings (WBTs):
142068: Clear Air Act Overview
142069: SIP and TCM Requirements and Policies
142070: SIP Development Process
142071: Transportation Conformity

Outcomes
Upon completion of the course, participants will be able to:

• Define SIP
• List different types of SIPs and their purposes
• Identify SIP requirements in Title I of the Clean Air Act
• Describe TCM requirements
• Describe what is meant by Reasonably Available Control Measure, or RACM, and how this applies to TCMs

Target Audience
The target audience for the Air Quality Series is transportation and air quality planners and engineers from State and local departments of transportation (DOT), metropolitan planning organizations (MPO), transit agencies, Federal agencies (Federal Highway Administration, Federal Transit Administration, U.S. Environmental Protection Agency, U.S. Department of Energy, etc.), and State and local environmental agencies. Others include transportation and environmental consultants, public officials and staff members, community and interest groups, as well as other stakeholders in the planning process.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 1 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-142070

COURSE TITLE
Air Quality Planning: SIP Development Process - WEB-BASED

This course provides an overview of the State Implementation Plan (or SIP) development process, focusing on agency roles, with an explanation of the problem definition and solution parts of the process. This course also covers motor vehicle emission budgets that are included in SIPs and used in conformity determinations, as well as describes EPA's procedures in approving and disapproving SIPs.

This is the third in a series of air quality Web-based trainings (WBTs):
142068: Clear Air Act Overview
142069: SIP and TCM Requirements and Policies
142070: SIP Development Process
142071: Transportation Conformity

OUTCOMES
Upon completion of the course, participants will be able to:

- Describe the SIP development process;
- Identify the various emission sources and describe emission trends;
- List the steps involved in preparing emission inventories;
- Describe how SIP emission reductions are determined; and
- Describe the different types of control measures, emphasizing the role of transportation-related strategies.

TARGET AUDIENCE
The target audience for the Air Quality Series is transportation and air quality planners and engineers from State and local departments of transportation (DOT), metropolitan planning organizations (MPO), transit agencies, Federal agencies (Federal Highway Administration, Federal Transit Administration, U.S. Environmental Protection Agency, U.S. Department of Energy, etc.), and State and local environmental agencies. Others include transportation and environmental consultants, public officials and staff members, community and interest groups, as well as other stakeholders in the planning process.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 2 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-142071

COURSE TITLE
Air Quality Planning: Transportation Conformity - WEB-BASED

This course defines transportation conformity and is designed for individuals that are new to transportation conformity, with little to no experience with the Transportation Conformity Rule.

This introductory transportation conformity course will answer questions related to the “what” of transportation conformity. What is transportation conformity? What activities are covered by conformity? What are the major requirements?

This course does not address how transportation conformity regulations are met. That topic is an advanced subject matter area and out of scope for an introductory transportation conformity course.

This is the fourth in a future series of air quality Web-based trainings (WBTs):
142068: Clear Air Act Overview
142069: SIP and TCM Requirements and Policies
142070: SIP Development Process
142071: Transportation Conformity

OUTCOMES
Upon completion of the course, participants will be able to:
• Relate transportation conformity to Transportation Improvement Programs (TIPs) and transportation plans
• Define transportation conformity
• Explain the transportation activities that are subject to conformity in a given timeframe
• Describe transportation conformity requirements for different activities
• Explain stakeholder responsibilities related to transportation conformity

TARGET AUDIENCE
The target audience for the Air Quality Series is transportation and air quality planners and engineers from State and local departments of transportation (DOT), metropolitan planning organizations (MPO), transit agencies, Federal agencies (Federal Highway Administration, Federal Transit Administration, U.S. Environmental Protection Agency, U.S. Department of Energy, etc.), and State and local environmental agencies. Others include transportation and environmental consultants, public officials and staff members, community and interest groups, as well as other stakeholders in the planning process.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1.5 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-142073

COURSE TITLE
Applying Section 4(f): Putting Policy into Practice

NHI 142073 Applying Section 4(f): Putting Policy into Practice is a 2-day interactive course that explains the history, purpose, and application of Section 4(f) within the context of the transportation project development process. Lessons include identifying Section 4(f) properties; explanations on types of use; an overview of Section 4(f) approval options; requirements for De Minimis determinations, individual 4(f) evaluations, and nationwide programmatic evaluations; selecting the appropriate approval option; and the relationship of Section 4(f) with NEPA and other environment laws and regulations.

OUTCOMES
Upon completion of the course, participants will be able to:
• · Explain the history and purpose of Section 4(f)
• · Identify the agencies subject to Section 4(f) compliance
• · Describe the applicability criteria for Section 4(f) properties
• · Describe the relationship among Section 4(f), NEPA project development, and other environmental requirements
• · Differentiate the roles and responsibilities of participants in the Section 4(f) process
• · Apply the Section 4(f) decision-making process within transportation project development
• · Describe what is necessary to document Section 4(f) compliance

TARGET AUDIENCE
State Departments of TransportationFHWA Headquarters and Field staff, including Federal Lands Consultants Officials with jurisdiction of affected Section 4(f) resources, e.g. State Historic Preservation Offices, Tribal Historic Preservation Offices, park owners, etc. Other Federal agencies involved with environmental resources Local agencies, including project sponsors and transit agencies Public/Special interest groups or Non-Governmental Organizations (NGOs) Transportation Planning Partners Tribes

TRAINING LEVEL: Basic

FEE: 2022: $500 Per Person; 2023: $770 Per Person

LENGTH: 2 DAYS (CEU: 1.4 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-142075

COURSE TITLE
Environmental Justice Analysis

Environmental Justice Analysis is a 2-day Instructor-led Training (ILT) course offered by NHI, the authoritative source in transportation training. The goal of this course is to increase knowledge and skills pertaining to the analysis associated with identifying and addressing disproportionately high and adverse effects of transportation programs, plans, projects, and activities on minority populations and low-income populations. This course provides participants with the information, tools, and data resources to perform EJ analysis activities to help ensure equitable transportation decision making and compliance with transportation planning regulations and NEPA. By accurately identifying communities, practitioners can better address potential adverse impacts to EJ communities and populations, and ensure they are meaningfully involved early and continually throughout the transportation decision-making process. This course provides participants with the procedural concepts, resources, and information to identify EJ populations; recognize potentially adverse impacts and/or benefits; develop and evaluate mitigation measures to address disproportionately high and adverse effects; and approaches for documenting findings and process. This course also provides participants with analysis tools and techniques to identify and address disproportionately high and adverse effects on minority populations and low-income populations during transportation planning and project development.

Throughout the course, participants will have opportunities to use scenarios and data to do the following: estimate spatial scope and magnitude of potential impacts; identify benefits of proposed actions; determine equitable distribution of benefits and burdens; and determine how to communicate findings and document methodology, results, and findings.

Outcomes
Upon completion of the course, participants will be able to:

- Identify the basis and importance of EJ analysis to improving decision-making processes.
- Describe how to perform an EJ analysis during transportation planning and project development using the EJ analysis framework and available data sources, tools, and strategies.
- Develop EJ analysis findings that ensure equitable transportation decision-making during transportation planning.
- Develop EJ analysis findings in the context of an environmental review to ensure compliance with EJ Executive Order 12898, U.S.DOT and FHWA EJ orders, and all other requirements relevant to the NEPA process.
- Identify emerging issues that may impact the analysis of EJ populations as part of transportation decision-making.

Target Audience
The target audience for this instructor-led training course includes transportation practitioners (entry-level, mid-level, and senior-level) who are employed at a range of organizations, including State Departments of Transportation (State DOTs), Metropolitan Planning Organizations (MPOs), local public agencies, and consulting firms. Participants should have at least a college-level education or higher and may hold the following professional roles: data analyst, planner, engineer, project development specialist, environmental specialist, civil rights specialist, consultant, or any other job function that may require knowledge of Environmental Justice (EJ) and transportation. Lastly, participants should have a basic understanding of EJ and transportation planning and project development.

Training Level: Intermediate

Fee: 2022: $500 Per Person; 2023: $650 Per Person

Length: 2 DAYS (CEU: 1.2 UNITS)

Class Size: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Basics of Public Involvement in Transportation Decision Making

Basics of Public Involvement in Transportation Decision Making is a 4-hour Web-based Training course offered by NHI, the authoritative source in transportation training.

Effectively engaging the public in transportation decisions can help build support for the project, which can promote cost savings by reducing project delays and improving the project delivery process. NHI-142077 Basics of Public Involvement in Transportation Decision Making provides transportation practitioners with the knowledge and tools needed to better engage the public in transportation decisions as well as meet Federal requirements for public involvement.

In this course, participants will discover the importance of public involvement in transportation decision making and become familiar with the broad range of strategies and techniques transportation practitioners can use to identify and engage the public in a meaningful way.

This course explores the relationship between public involvement and transportation decision making. It presents participants with an overview of Federal public involvement regulations and directives for transportation planning, programming, and project development, as well as a framework for engaging the public using a variety of approaches.

OUTCOMES

Upon completion of the course, participants will be able to:

• Identify the importance of public involvement
• Recall the background of public involvement
• Recall the requirements of public involvement
• Recognize the purpose and importance of participation and public engagement during the planning and NEPA processes
• Recall which members of the public are potential participants in the transportation decision-making process
• Choose how to tailor public involvement communication to engage a variety of constituents
• Identify effective public involvement techniques appropriate to a variety of situations
• Identify strategies for promoting participant interaction
• Identify how to solicit and use public feedback to inform transportation decision making
• Select evaluation strategies and methods that are suitable for determining the effectiveness of a public engagement plan
• Identify emerging trends and innovative approaches to public involvement

TARGET AUDIENCE

The target audience for this WBT course includes transportation practitioners from Federal, State, regional, and local agencies, particularly data analysts, planners, engineers, project development specialists, environmental specialists, civil rights specialists, consultants, and other professionals whose job function may require knowledge of public involvement to support transportation decision making.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 4 HOURS (CEU: .4 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-142078

Course Title
Planning and Environment Linkages (PEL)

Planning and Environment Linkages (PEL) is a 2-day instructor-led training course offered by NHI, the authoritative source in transportation training.

Integrating PEL into the transportation planning and environment review processes promotes more informed decision-making and accelerated project delivery. Furthermore, several policies and authorities encourage the implementation of PEL.

The course emphasizes the following benefits of PEL: accelerate project delivery, development of purpose and need early in the planning process, elimination of unreasonable alternatives during the planning process, early and improved coordination with resource agencies and stakeholders, improved program and informed project decisions, less duplication and improve documentation, promotion of efficient and cost-effective solutions, earlier consideration of potential environmental effects, and enhanced consultation, coordination, and public involvement.

As a participant, you will learn and discuss why PEL has been a successful practice, the benefits of PEL, the points of interface between planning and environmental review processes, PEL approaches using authorities associated with planning and environmental review, informing, using, or adopting planning information in the environmental review process, general considerations for using any PEL approach, the processes for developing purpose and need during planning that can be used in NEPA, the process for screening and eliminating unreasonable alternatives during planning, the role of Consultation, Coordination, and Public Involvement in PEL, documentation in a PEL approach, and action strategies to advance PEL in your State or region.

Outcomes
Upon completion of the course, participants will be able to:

- Identify why PEL has been a successful practice for transportation practitioners.
- Describe how planning and environment review processes interface.
- Summarize how specific authorities and their requirements influence how States and MPOs approach PEL.
- Identify different approaches for PEL, their related flexibilities and how to transition this information into NEPA.
- Summarize how applying PEL in planning supports development of purpose and need for the environmental review process.
- Summarize how to use PEL in screening and eliminating unreasonable alternatives during planning.
- Describe how public involvement supports PEL.
- Summarize how documentation is essential to a PEL approach.
- Identify strategies to implement PEL and accelerate project delivery.

Target Audience
The target audience includes transportation practitioners employed at State Departments of Transportation (State DOTs), Resource Agencies, Metropolitan Planning Organizations (MPOs), and local public agencies, as well as the Federal Highway Administration (FHWA), Federal Transit Administration (FTA) and regulatory agencies with a role in NEPA permitting, approving, or mitigating potential impacts from transportation projects. Typical course participants have a college degree and work as an analyst, planner, project development specialist, environmental specialist, public involvement specialist, civil rights specialist, consultant, or any other position requiring knowledge of PEL.
TRAINING LEVEL: Intermediate

FEE: 2022: $500 Per Person; 2023: $530 Per Person

LENGTH: 2 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Planning and Environment Linkages (PEL), without Implement PEL Activity

This course is a slightly shorter version of the 2-day instructor-led course, NHI-142078 Planning and Environment Linkages (PEL). Both courses are offered by NHI, the authoritative source in transportation training, and both focus on the integration of PEL into the transportation planning and environmental review process. However, NHI-142078 includes an additional activity to help practitioners identify strategies to implement PEL in their State or region, which is omitted in this course.

Integrating PEL into the transportation planning and environmental review process promotes more informed decision-making and accelerated project delivery. Furthermore, several policies and authorities encourage the implementation of PEL.

The course emphasizes the following benefits of PEL: accelerate project delivery, development of purpose and need early in the planning process, elimination of unreasonable alternatives during the planning process, early and improved coordination with resource agencies and stakeholders, improved program and informed project decisions, less duplication and improved documentation, promotion of efficient and cost-effective solutions, earlier consideration of potential environmental effects, and enhanced consultation, coordination, and public involvement.

As a participant, you will learn and discuss why PEL has been a successful practice; the benefits of PEL; the points of interface between planning and environmental review processes; PEL approaches using authorities associated with planning and environmental review; informing, using, or adopting planning information in the environmental review process; general considerations for using any PEL approach; the processes for developing purpose and need during planning that can be used in NEPA; the process for screening and eliminating unreasonable alternatives during planning; the role of consultation, coordination, and public involvement in PEL; and documentation in a PEL approach.

OUTCOMES
Upon completion of the course, participants will be able to:

• Identify why PEL has been a successful practice for transportation practitioners.
• Describe how planning and environmental review processes interface.
• Summarize how specific authorities and their requirements influence how States and MPOs approach PEL.
• Identify different approaches for PEL, their related flexibilities and how to transition this information into NEPA.
• Summarize how applying PEL in planning supports development of purpose and need for the environmental review process.
• Summarize how to use PEL in screening and eliminating unreasonable alternatives during planning.
• Describe how public involvement supports PEL.
• Summarize how documentation is essential to a PEL approach.

TARGET AUDIENCE
The target audience includes transportation practitioners employed at State Departments of Transportation (State DOTs), Resource Agencies, Metropolitan Planning Organizations (MPOs), and local public agencies, as well as the Federal Highway Administration (FHWA), Federal Transit Administration (FTA) and regulatory agencies with a role in NEPA permitting, approving, or mitigating potential impacts from transportation projects. Typical course participants have a college degree and work as an analyst, planner, project development specialist, environmental specialist, public involvement specialist, civil rights specialist, consultant, or any other position requiring knowledge of PEL.
TRAINING LEVEL: Intermediate

FEE: 2022: $500 Per Person; 2023: $530 Per Person

LENGTH: 16 HOURS (CEU: 1 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Planning and Environment Linkages (PEL) (VIRTUAL DELIVERY)

Planning and Environment Linkages (PEL) is a 2-day instructor-led training course offered by NHI, the authoritative source in transportation training.

Integrating PEL into the transportation planning and environment review processes promotes more informed decision-making and accelerated project delivery. Furthermore, several policies and authorities encourage the implementation of PEL.

The course emphasizes the following benefits of PEL: accelerate project delivery, development of purpose and need early in the planning process, elimination of unreasonable alternatives during the planning process, early and improved coordination with resource agencies and stakeholders, improved program and informed project decisions, less duplication and improve documentation, promotion of efficient and cost-effective solutions, earlier consideration of potential environmental effects, and enhanced consultation, coordination, and public involvement.

As a participant, you will learn and discuss why PEL has been a successful practice, the benefits of PEL, the points of interface between planning and environmental review processes, PEL approaches using authorities associated with planning and environmental review, informing, using, or adopting planning information in the environmental review process, general considerations for using any PEL approach, the processes for developing purpose and need during planning that can be used in NEPA, the process for screening and eliminating unreasonable alternatives during planning, the role of Consultation, Coordination, and Public Involvement in PEL, documentation in a PEL approach, and action strategies to advance PEL in your State or region.

Outcomes
Upon completion of the course, participants will be able to:

• Identify why PEL has been a successful practice for transportation practitioners.
• Describe how planning and environment review processes interface.
• Summarize how specific authorities and their requirements influence how States and MPOs approach PEL.
• Identify different approaches for PEL, their related flexibilities and how to transition this information into NEPA.
• Summarize how applying PEL in planning supports development of purpose and need for the environmental review process.
• Summarize how to use PEL in screening and eliminating unreasonable alternatives during planning.
• Describe how public involvement supports PEL.
• Summarize how documentation is essential to a PEL approach.
• Identify strategies to implement PEL and accelerate project delivery.

Target Audience
The target audience includes transportation practitioners employed at State Departments of Transportation (State DOTs), Resource Agencies, Metropolitan Planning Organizations (MPOs), and local public agencies, as well as the Federal Highway Administration (FHWA), Federal Transit Administration (FTA) and regulatory agencies with a role in NEPA permitting, approving, or mitigating potential impacts from transportation projects. Typical course participants have a college degree and work as an analyst, planner, project development specialist, environmental specialist, public involvement specialist, civil rights specialist, consultant, or any other position requiring knowledge of PEL.
TRAINING LEVEL: Intermediate

FEE: 2022: $450 Per Person; 2023: $530 Per Person

LENGTH: 12 HOURS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-151043

Course Title
Integrating Transportation and Land Use

The course is designed to help practitioners plan multimodal transportation systems that support community development goals and shape land use patterns that support transportation system performance goals. Course lessons include determining the interplay between transportation systems and land use development patterns, the processes and principles that influence integrated transportation and land use planning, and strategies for applying integrated land use and transportation principles to different types and scales of planning and decision-making processes.

Outcomes
Upon completion of the course, participants will be able to:
- Identify key concepts related to integrating transportation and land use.
- Define accessibility.
- Use a travel diary to calculate accessibility for different scales of communities.
- Describe the unwritten rules for optimizing accessibility that affect urban development patterns.
- Illustrate the inverse relationship between the two strategies for optimizing accessibility.
- Examine the impacts of accessibility on travel-time, land, travel, and opportunity costs.
- Summarize the iterative relationship between the scale of a town, city, or region and the characteristics of its economic activity and its transportation network.
- Describe the relationships among proximity, travel speeds, and travel modes across the range of urban development patterns.
- Distinguish roadway level of service measures from accessibility level of service measures.
- Describe analysis methods and policy tools for integrating land use and transportation planning.
- Predict how decisions made by private sector individuals and public sector planning agencies influence the development patterns and socio-economic characteristics of an urban or regional system.
- Differentiate between beneficial and detrimental actions of participants in the land use and transportation planning and decision-making process.
- Identify the elements that contribute to integrated planning.
- Explain the relationships among the three principles of integrated planning and its three supporting elements.
- Determine appropriate strategies for applying integrated planning principles to a regional multimodal plan.
- Choose appropriate strategies for applying integrated planning principles to transportation corridor project planning and design.
- Determine appropriate strategies for applying integrated planning principles to municipal land use planning and regulatory processes.

Target Audience
Primary: Mid-level State DOT employees, City and County engineers and planners, MPO staff, transit operators, Federal employees (FHWA, FTA, EPA), resource agency staff, consultants. Secondary: Elected officials, regulatory agency staff, local zoning officials, site designers, citizen activists, developers, media representatives and business leaders.
TRAINING LEVEL: Intermediate

FEE: 2022: $0 Per Person; 2023: N/A

LENGTH: 7 HOURS (CEU: .7 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-151046

Course Title
FHWA Planning and Research Grants: History, Sources, and Regulations - WEB-BASED

NHI 151046 is a 2-hour WBT that introduces Federal financial assistance and FHWA’s planning and research grant regulations. The course covers sources for requirements and funds; sources and hierarchy of Federal grant requirements; and the process for providing grant funding, as it relates to 23 CFR 420 and 450.

This Web-based training (WBT) course is one of a series designed as an introduction to FHWA planning and research grant administration. The series includes four independent WBTs that cover the history of FHWA planning and research grants, the Common Grant Rule, Cost Principles, and Audits:

FHWA-NHI-151046--FHWA Planning and Research Grants: History, Sources, and Regulations;
FHWA-NHI-151047--FHWA Planning and Research Grants: Common Grant Rule;
FHWA-NHI-151048--FHWA Planning and Research Grants: Cost Principles; and
FHWA-NHI-151049--FHWA Planning and Research Grants: Audits.

These WBTs are designed to complement FHWA-NHI-151021 Administration of FHWA Planning and Research Grants, a 2-day Instructor-led training course. They are not intended to replace NHI 151021.

Outcomes
Upon completion of the course, participants will be able to:

- Identify basic principles of grant administration
- Describe the hierarchy of laws, regulations, requirements, and the relationship among them
- Explain terminology associated with grant administration
- Explain the purpose and policy for 23 CFR, Part 420

Target Audience
The target audience includes FHWA, State Department of Transportation (State DOT), Metropolitan Planning Organization (MPO), and other agency staff who expend or administer Federal-aid funds, including planning, engineering, and fiscal staff.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 2 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-151050

COURSE TITLE
Traffic Monitoring Programs: Guidance and Procedures

Participants are encouraged to bring their own copy of the FHWA Traffic Monitoring Guide 2016 and a calculator. The training room must be large enough to allow for group exercises, as well as room to display local traffic data collection equipment.

Additionally, the FHWA Office of Highway Policy Information offers a complimentary presentation of the Travel Monitoring Analysis System (TMAS) in conjunction with this training course. Please contact Steven Jessberger (Steven.Jessberger@dot.gov) for more information.

Developed in conjunction with the 5th revision of the FHWA Traffic Monitoring Guide (TMG 2016), this course replaces NHI 151018 and offers guidance on how to manage a successful traffic monitoring program. The training begins with an overview of Federal traffic monitoring regulations and a presentation of the host State's traffic monitoring program. Subsequent lessons introduce federal guidance, best practices, and recommended procedures for developing a data collection framework for traffic volume, speed, classification, weight, and non-motorized programs. The course also incorporates related traffic monitoring elements of transportation management and operations, traffic data needs and uses, traffic data submittal requirements, and relevant traffic monitoring research. The critical importance of quality data collection is emphasized to support project planning, programming, design, and maintenance decisions-- all of which affect the Nation's transportation network.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the appropriate use of the TMG
• Describe the TMG procedures for obtaining traffic monitoring data for Federal and State programs
• Explain how to apply traffic monitoring data to answer specific questions on Federal and State issues
• Explain traffic data reporting requirements
• Explain the value of cooperative and multi-disciplinary approaches to traffic monitoring programs

TARGET AUDIENCE
This Instructor-led training (ILT) course is designed for transportation professionals involved in traffic monitoring programs. Primarily intended for FHWA and State DOT staff, this training is also relevant to regional and local government staff, as well as others whose roles include development and/or oversight of traffic monitoring programs. There are no course pre-requisites or assumed pre-training competencies.

TRAINING LEVEL: Basic

FEE: 2022: $350 Per Person; 2023: $350 Per Person
LENGTH: 2 DAYS (CEU: 1.4 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-151052

COURSE TITLE
Basics of Transportation Planning
This course provides an introduction to the Statewide, metropolitan, and rural transportation planning requirements and highlights techniques that may be applied. It highlights the transportation requirements and planning processes, and why they are important; identifies the key stakeholders and describes their roles, responsibilities, and relationships in informed decision making.

OUTCOMES
Upon completion of the course, participants will be able to:
• Explain why the transportation planning process exists and why it is important
• Describe the requirements of the transportation planning process
• Identify the players in the process and describe their roles and responsibilities

TARGET AUDIENCE
Metropolitan Planning Organizations (MPOs)/Regional Transportation Planning Organizations or affected nonmetropolitan transportation officials with responsibility for transportation planning
State Departments of Transportation
Federal Highway Administration and Federal Transit Administration
Planning, Programming, or Project Development staff working or participating in the Statewide or Metropolitan Transportation Planning process
Transit Agencies

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 4 HOURS (CEU: .4 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-151053

COURSE TITLE
Transportation Planning Process

Transportation Planning Process (course number FHWA-NHI-151053) gives participants the opportunity to explore, discuss, and practice what they learned in the FHWA-NHI-151052, Basics of Transportation Planning web-based training where participants received an overview of the metropolitan and statewide transportation planning process. This course underscores transportation planning's relationship to informed decision-making and the required planning process. This course expands knowledge of transportation planning practice fundamentals and the ability to convey the relationship of these principles to the Federal planning program requirements. Participants gain knowledge and understanding of planning practice fundamentals through the use of engaging interactive activities.

This instructor-led training reflects the current laws, regulations and issues relevant to the transportation planning process. This consolidated course is jointly developed by the Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA) in concert with their respective training branches NTI and NHI.

PLEASE NOTE: Participants are expected to complete NHI-151052 Basics of Transportation Planning as a prerequisite to this course. NHI-151052 Basics of Transportation Planning is a free 4-hour web-based training course.

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain the legislative requirements for States and MPOs to conduct the transportation planning process.
• Describe the content and purpose of statewide and metropolitan transportation plans and programs.
• Identify the steps and activities in a performance-based approach to planning and programming supported by public engagement and intergovernmental cooperation.
• Explain the relationship between the transportation planning process and other community planning processes.
• Identify participants and their roles and responsibilities in planning.
• Differentiate appropriate levels of consultation, cooperation, and engagement among stakeholders and the public.

TARGET AUDIENCE
Metropolitan Planning Organizations (MPOs) Regional Planning Organizations or affected non-metropolitan transportation officials with responsibility for transportation planning State Departments of Transportation Planning, Transportation Planning, Programming, or Project Development staff working or participating in the Statewide or Metropolitan Transportation Planning Process Transit Agencies and/or Providers, Federal Highway Administration and Federal Transit Administration. If you have questions about this NHI training, please contact NHI at nhicustomerservice@dot.gov or 877.558.6873.

TRAINING LEVEL: Intermediate

FEE: 2022: $315 Per Person; 2023: N/A

LENGTH: 2 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-151055

Course Title
Statewide and Metropolitan Transportation Programming

Statewide and Metropolitan Transportation Programming is a Web-based Training (WBT) course offered by NHI, the authoritative source in transportation training.

This web-based course is intended to provide introductory-level information for transportation planning and programming staffs on the process and requirements for developing and implementing metropolitan Transportation Improvement Programs (TIPs) and Statewide Transportation Improvement Programs (STIPs). The course highlights the FHWA/FTA requirements for statewide, non-metropolitan, and metropolitan transportation planning and programming processes; as well as describes the relationships, roles, and responsibilities of key partners and stakeholders in informed transportation decision-making.

Learners will explore the connections between long-range transportation planning and how projects are prioritized for funding and subsequent implementation within metropolitan TIPs and STIPs as part of an informed transportation decision-making process.

The course provides an overview of the process and requirements for developing and implementing metropolitan TIPs and STIPs, including connections to public involvement, financial planning/fiscal constraint, performance-based planning and programming (PBPP), TIP/STIP administrative modifications and amendments, and FHWA/FTA review and approval of responsibilities/actions.

Outcomes

Upon completion of the course, participants will be able to:

• Recall terms, concepts, and acronyms.
• Recognize how metropolitan areas and States reach decisions on transportation policies, plans, and programs.
• Identify major funding sources and the flexibility to use funds in addressing metropolitan and statewide transportation needs.
• Recognize the relationship between transportation planning and public involvement.
• Identify the role of key documents in transportation decision making.
• Define the concept of fiscal constraint in relation to financial planning and programming.
• Identify how projects are selected and programmed in the STIP/TIP.
• Identify processes related to transportation program approval and implementation.

Target Audience

The target audience for this course consists of Metropolitan Planning Organizations (MPOs), State Departments of Transportation (State DOTs), transit agencies, Regional Transportation Planning Organizations (RTPOs) or affected metropolitan transportation officials with responsibility for transportation planning, Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) planning staffs, and transportation planning/programming/project development staff working or participating in the statewide or metropolitan transportation planning process.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 3 HOURS (CEU: .3 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-151056

COURSE TITLE
Highway Performance Monitoring System (HPMS): Concepts, Data Collection & Reporting Requirements

The National Highway Institute (NHI) workshop titled, Highway Performance Monitoring System (HPMS): Concepts, Data Collection & Reporting Requirements, is a two-day workshop intended to provide advanced, in-depth, hands-on understanding of data collection and reporting requirements for HPMS. The workshop is designed to cover:

HPMS Program Background
The HPMS 2010+ Data Model
HPMS Data Collection and Reporting Requirements
Statistical Sampling Requirements; and
The HPMS Submittal Process

OUTCOMES
Upon completion of the course, participants will be able to:

• Upon completion of the workshop, participants will be able to:
  • Describe the Scope of HPMS
  • Describe the Background of HPMS
  • Describe the structure of the HPMS Data Model, in terms of the various catalogs and datasets that comprise the model
  • Describe the various HPMS datasets
  • Differentiate between the datasets that are to be developed/submitted by the States, and the datasets that will be developed/maintained by FHWA
  • Explain how geo-referencing is performed in HPMS for analysis and reporting purposes
  • Describe the structure of the Sections and Sample Panel Identification datasets
  • Explain the relationship between the Sections and Sample Panel Identification datasets and how these are used for sampling purposes
  • Interpret the data collection, coding, and reporting requirements for the Sections dataset
  • Describe the Sampling Framework that is used within the context of the Highway Performance Monitoring System (HPMS)
  • Discuss the way in which AADT Volume Groups and Precision Levels are used for sampling purposes in HPMS
  • Explain the Sample Size Estimation procedure and how it is used in HPMS
  • Discuss the importance of Sample Adequacy and Sample Maintenance in HPMS
  • Describe the steps involved in the annual submittal of the various HPMS datasets

TARGET AUDIENCE
This two-day workshop is intended for State DOT HPMS staff, including: Staff responsible for data collection, processing, analysis, and production of the annual HPMS submittal. While primarily targeted for those responsible for the assembling the annual HPMS submittal, others who can benefit from this training are: GIS staff responsible for developing/providing HPMS-related data, Traffic data providers, Pavement data providers, Road Inventory data providers, MPO Staff who provide HPMS-related data to State DOTs, Local agency staff that provides HPMS-related data to their State DOT. This workshop is designed for those individuals seeking to obtain an understanding or expand their basic knowledge of the annual data collection and reporting requirements for HPMS. The material covered in this workshop is primarily based on requirements which were a product of the 2010+ Reassessment.
**TRAINING LEVEL:** Basic

**FEE:** 2022: $400 Per Person; 2023: $400 Per Person

**LENGTH:** 2 DAYS (CEU: 0 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-151057

Course Title
FHWA Planning and Research Grants: Program Administration (23 CFR Part 420)

This course is the first in a series of Web-based training courses updated in 2018. The course series covers the background of FHWA planning grants through the audit process after the grant has been completed. +FHWA Planning and Research Grants: Program Administration (23 CFR Part 420) (FHWA-NHI-151057); +FHWA Planning and Research Grants: The Uniform Guidance (2 CFR Part 200) - Part 1 (FHWA-NHI-151058); +FHWA Planning and Research Grants: The Uniform Guidance (2 CFR Part 200) - Part 2 (FHWA-NHI-151059)

‘FHWA Planning and Research Grants: Program Administration (23 CFR Part 420)’ is a 2-hour Web-based Training course offered by NHI, the authoritative source in transportation training.

Recent legislation has introduced changes to the requirements around the administration of FHWA planning and research grants. This course is the first of a series of Web-based Training courses on this topic and provides an introduction to the series. Learners will gain familiarity with terms and general concepts around grants. They will also learn the requirements of 23 CFR Part 420—the regulation that implements the Federal-Aid highway planning program outlined in Title 23 and contains the specific FHWA grant policies and procedures that need to be followed.

The course consists of three lessons:

Lesson 1 (Overview) covers key terms associated with and guidelines and legislation that govern the administration of FHWA planning and research grants, distribution of FHWA planning and research funds, and the steps of the grants funding process.

Lesson 2 (23 CFR Part 420 Subpart A) covers the purpose, terminology, and requirements of grants administration outlined in 23 CFR Part 420 Subpart A.

Lesson 3 (23 CFR Part 420 Subpart B) covers the purpose, terminology, and requirements of grants administration outlined in 23 CFR Part 420 Subpart B.

This course series was revised and republished in April 2018 in response to the Office of Management and Budget’s promulgation of 2 CFR 200 (Unified Administrative Requirements, Cost Principles and Audit for Federal Awards; also referred to as the “Uniform Guidance” or “Supercircular”) and the enactment of the MAP-21 and FAST Acts. The course includes direct links to the full text of the regulations, as they are discussed throughout the course.

The course includes an assessment, which learners must pass at 70% to receive credit for the course.

To enroll in this Web-based Training course, click ‘Add To Cart.’

Outcomes
Upon completion of the course, participants will be able to:

• Define key terms associated with FHWA planning and research grants
• Describe various guidelines and legislation that govern the administration of FHWA planning and research grants
• Discuss the distribution of FHWA planning and research funds
• Define the steps of the grants funding process
• Explain the purpose of 23 CFR Part 420
• Describe the requirements of 23 CFR Part 420

Target Audience
The target audience for this Web-based Training course includes FHWA, FTA, State Department of Transportation (State DOTs), Metropolitan Planning Organization (MPOs), and other agency staff that expend or administer Federal-aid funds—including planning, engineering, and fiscal staff.
TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 2 HOURS (CEU: .2 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-151058

COURSE TITLE
FHWA Planning and Research Grants: The Uniform Guidance (2 CFR Part 200) - Part 1

This course is the second in a series of Web-based training courses updated in 2018. The course series covers the background of FHWA planning grants through the audit process after the grant has been completed.

FHWA Planning and Research Grants: Program Administration (23 CFR Part 420) (FHWA-NHI-151057)

--> FHWA Planning and Research Grants: The Uniform Guidance (2 CFR Part 200) - Part 1 (FHWA-NHI-151058)

FHWA Planning and Research Grants: The Uniform Guidance (2 CFR Part 200) - Part 2 (FHWA-NHI-151059)
‘FHWA Planning and Research Grants: The Uniform Guidance (2 CFR Part 200) - Part 1’ is a 1.5-hour Web-based Training course offered by NHI, the authoritative source in transportation training.
Recent legislation has introduced changes to the requirements around the administration of FHWA planning and research grants. This course is the second in a series of Web-based Training courses on this topic and introduces 2 CFR Part 200, the Uniform Guidance. Learners will gain familiarity with the history and overview of the Uniform Guidance, and will get into detail on Subparts A through D.
The course consists of three lessons:
Lesson 1 (History and Overview) covers a brief history of the Uniform Guidance, the responsibilities of the States, and the flow of requirements to state and local governments.
Lesson 2 (Definitions, General Provisions, and Pre-Award Requirements) covers key terms, general provisions, and pre-award requirements, as presented in Subparts A through C of the Uniform Guidance.
Lesson 3 (Post Federal Award Requirements) covers Post Federal Award Requirements, which are presented in Subpart D of the Uniform Guidance.
This course series was revised and republished in April 2018 in response to the Office of Management and Budget's promulgation of 2 CFR Part 200 (Unified Administrative Requirements, Cost Principles and Audit for Federal Awards; also referred to as the “Uniform Guidance” or “Supercircular”) and the enactment of the MAP-21 and FAST Acts. The course includes direct links to the full text of the regulations, as they are discussed throughout the course.
The course includes an assessment, which learners must pass at 70% to receive credit for the course.
To enroll in this Web-based Training course, click ‘Add To Cart.’

OUTCOMES
Upon completion of the course, participants will be able to:
• Discuss a brief history of the Uniform Guidance
• Describe the responsibilities of the States, in relation to grants management
• Explain the flow of requirements to state and local governments
• Define key terms in the Uniform Guidance (Subpart A)
• Discuss general provisions of the Uniform Guidance (Subpart B)
• Identify pre-award requirements (Subpart C)
• Discuss post-award requirements (Subpart D)

TARGET AUDIENCE
The target audience for this Web-based Training course includes FHWA, FTA, State Department of Transportation (State DOTs), Metropolitan Planning Organization (MPOs), and other agency staff that expend or administer Federal-aid funds--
including planning, engineering, and fiscal staff.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $0 Per Person; 2023: $0 Per Person

**LENGTH:** 1.5 HOURS (CEU: .2 UNITS)

**CLASS SIZE:** MINIMUM: 0; MAXIMUM: 0

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
This course is the third in a series of Web-based training courses updated in 2018. The course series covers the background of FHWA planning grants through the audit process after the grant has been completed.

Recent legislation has introduced changes to the requirements around the administration of FHWA planning and research grants. This course is the third in a series of Web-based training courses on this topic and completes the discussion of 2 CFR 200, the Uniform Guidance (started in course 151058). Learners will explore the last two subparts of the Uniform Guidance, which are Subpart E on Cost Principles and Subpart F on Audit Requirements.

The course consists of four lessons:

Lesson 1 (Cost Principles - Part 1) covers the first few subject groups of Subpart E, which are General Provisions; Basic Considerations; Direct and Indirect Costs; and Special Considerations for States, Local Governments, and Indian Tribes.

Lesson 2 (Cost Principles - Part 2) covers the last subject group of Subpart E—the General Provisions for Selected Items of Cost, which explains which costs are allowable and which are unallowable.

Lesson 3 (Audit Terms & Requirements) covers key terms and basic requirements for the audit of Federal awards.

Lesson 4 (Audit Roles & Responsibilities) covers the roles and responsibilities associated with the audit of Federal awards.

This course series was revised and republished in April 2018 in response to the Office of Management and Budget’s promulgation of 2 CFR 200 (Unified Administrative Requirements, Cost Principles and Audit for Federal Awards; also referred to as the “Uniform Guidance” or “Supercircular”) and the enactment of the MAP-21 and FAST Acts. The course includes direct links to the full text of the regulations, as they are discussed throughout the course.

The course includes an assessment, which learners must pass at 70% to receive credit for the course.

To enroll in this Web-based Training course, click ‘Add To Cart.’

OUTCOMES

Upon completion of the course, participants will be able to:

• Define general terms related to cost principles
• Discuss the General Provisions of Subpart E
• Explain key terms and concepts covered in Basic Considerations of Subpart E
• Discuss Direct and Indirect (F&A) Costs
• Discuss key terms, allocation methods, and related procedures for indirect cost proposals
• Identify costs that are allowable and unallowable under Subpart E
• Define key terms associated with audits
• Discuss the audit requirements for federal awards
• Distinguish between a subrecipient and a contractor
• Discuss the roles and responsibilities of auditees, federal agencies, and auditors
• Identify online resources related to audits

TARGET AUDIENCE
The target audience for this Web-based Training course includes FHWA, FTA, State Department of Transportation (State DOTs), Metropolitan Planning Organization (MPOs), and other agency staff that expend or administer Federal-aid funds— including planning, engineering, and fiscal staff.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 2 HOURS (CEU: .2 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-152054

Course Title
Introduction to Urban Travel Demand Forecasting

Through classroom lectures and interactive workshops, this introductory course covers the traditional four-step modeling process of trip generation, trip distribution, mode choice, and trip assignment. The course includes presentations on land use inputs, network and zone structures, time of day factoring, and reasonableness checking.

In order to ensure that participants have a basic overview of travel demand forecasting, each registered participant will receive a Self-Instructional CD—entitled Introduction to Travel Forecasting—in advance of a scheduled session. To ensure that these CDs are shipped, we request that the Host provide the instructor coordinator with names and mailing addresses of their registrants. Participants are expected to complete the CD in advance of the session.

A half day computer lab exercise is included to reinforce the concepts presented in the classroom. The hosting organization is responsible for providing MS Windows microcomputers with color graphics, color monitors, and at least 10 megabytes of hard disk space. There should be no more than two participants per computer station.

Prerequisites: Computer experience and an understanding of college-level algebra. Participants must bring scientific calculators to the session.

Outcomes
Upon completion of the course, participants will be able to:
• Describe the role of travel forecasting within transportation planning
• Explain the principles of the four-step model: trip generation, trip distribution, mode choice, and trip assignment
• Demonstrate how input data is used in each step of the four-step model
• Identify reasonableness checks for model inputs, outputs, and equations
• Interpret the outputs from each step

Target Audience
Federal, State, local planners, and engineers, and consultants who wish to gain a better understanding of the principles and applications of travel demand forecasting models.

Training Level: Intermediate

Fee: 2022: $550 Per Person; 2023: $550 Per Person

Length: 4 DAYS (CEU: 2.4 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Using the AASHTO Audit Guide for the Procurement and Administration of A/E Contracts

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain the Federal and State laws, regulations, policies and procedures that relate to the procurement and administration of A/E contracts.
• Explain how to use audit information in the procurement and administration of A/E contracts.
• Identify and discuss concepts of direct and indirect, allowable and unallowable costs in A/E contracts.
• Locate selected tools and resources to assist in the procurement and administration of A/E contracts.

TARGET AUDIENCE
This course is particularly suited for practitioners associated with procurement, audit, and the administration of A/E contracts.

TRAINING LEVEL: Basic

FEES: 2022: $350 Per Person; 2023: $350 Per Person

LENGTH: 1 DAYS (CEU: .8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Using the AASHTO Audit Guide for the Procurement and Administration of A/E Contracts

Updated in 2019!

Using the AASHTO Audit Guide for the Procurement and Administration of A/E Contracts course is a one-day introductory course of interest to a wide variety of practitioners whose jobs require that they work with Architectural and Engineering (A/E) contracts. The course incorporates small- and large group discussions, case study activities, and both a scored and un-scored assessment to reinforce learning.

The course begins with an overview of government contracting for A/E services and the related roles and responsibilities. Participants learn about the A/E Project Cycle and discuss cost components common to A/E contracts.

Next, participants learn about important regulations and standards applicable to the administration of A/E contracts and the role of each. Key cost principles are covered so that participants can learn to distinguish between direct and indirect costs and to differentiate between the concepts of allowability, allocability, and reasonableness.

The importance of internal controls is emphasized as participants are taught to recognize risk factors and indicators of control deficiencies. In a discussion of key areas of costs, participants learn to use the AASHTO Uniform Audit & Accounting Guide to better understand directly associated costs and whether specific indirect costs are allowable. A case study helps participants to practice the application of these principles.

After an overview of A/E firm audits and related roles and responsibilities, participants review a sample cost proposal and related contract wording in order to begin linking audit information, cost proposals, and contracts. The course ends with a discussion of cognizance and the risk management framework followed by a review of select tools and resources that support the administration of A/E contracts.

OUTCOMES

Upon completion of the course, participants will be able to:

- Explain the Federal and State laws, regulations, policies and procedures that relate to the procurement and administration of A/E contracts.
- Explain how to use audit information in the procurement and administration of A/E contracts.
- Identify and discuss concepts of direct and indirect, allowable and unallowable costs in A/E contracts.
- Locate selected tools and resources to assist in the procurement and administration of A/E contracts.

TARGET AUDIENCE

This course is particularly suited for practitioners associated with procurement, audit, and the administration of A/E contracts.

TRAINING LEVEL: Basic

FEE: 2022: $350 Per Person; 2023: N/A

LENGTH: 6 HOURS (CEU: .8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-231029

COURSE TITLE
Using the AASHTO Audit Guide for the Development of A/E Consultant Indirect Cost Rates

NOTE: This course was updated in 2019 and reflects the updated references of 23 CFR 172, 2 CFR 200, 2016 AASHTO Audit Guide, and the 2018 National Compensation Matrix.

This two-day advanced course is of interest to a wide variety of practitioners who want to be able to apply the AASHTO Audit Guide in the development and administration of A/E design consultant direct and indirect costs and rates. This course is written for both prime A/E consultants and subconsultants.

OUTCOMES
Upon completion of the course, participants will be able to:
• Employ appropriate requirements, concepts, and tools necessary to develop and apply indirect cost rates to A/E contracts.
• Describe the required components of compliant internal controls.
• Prepare an appropriate analysis necessary to demonstrate the reasonableness of compensation.
• Interpret and apply Federal and State laws, regulations, policies and procedures.
• Explain various components of the external oversight framework including ethics, dispute resolution, and the FHWA function.
• Compare and distinguish between contract types and implications on account costing and billing.

TARGET AUDIENCE
This course is intended for those who perform one or more of the following roles:
• Performing indirect cost rate audits for A/E Design firms
• Ensuring compliance with the AASHTO Audit Guide
• Administering contracts or subcontracts and procuring services
• Managing contracts or subcontracts
• Ensuring compliance of contracts or subcontracts
• Providing oversight of local contracts or subcontracts
• Building and reviewing cost proposals
• Approving the payment of A/E design consultant invoices
• Auditing indirect cost and contract proposals
• Closing out and performing final reconciliations of contracts
• Designing and enforcing internal control systems
• Reviewing RFPs and contracts for government projects
• Selling A/E design services to State DOTs

TRAINING LEVEL: Intermediate

FEE: 2022: $600 Per Person; 2023: $600 Per Person

LENGTH: 2 DAYS (CEU: 1.4 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-231029V

COURSE TITLE
Using the AASHTO Audit Guide for the Development of A/E Consultant Indirect Cost Rates

NOTE: This course was updated in 2019 and reflects the updated references of 23 CFR 172, 2 CFR 200, 2016 AASHTO Audit Guide, and the 2018 National Compensation Matrix.

This two-day advanced course is of interest to a wide variety of practitioners who want to be able to apply the AASHTO Audit Guide in the development and administration of A/E design consultant direct and indirect costs and rates. This course is written for both prime A/E consultants and subconsultants.

OUTCOMES
Upon completion of the course, participants will be able to:
• Employ appropriate requirements, concepts, and tools necessary to develop and apply indirect cost rates to A/E contracts.
• Describe the required components of compliant internal controls.
• Prepare an appropriate analysis necessary to demonstrate the reasonableness of compensation.
• Interpret and apply Federal and State laws, regulations, policies and procedures.
• Explain various components of the external oversight framework including ethics, dispute resolution, and the FHWA function.
• Compare and distinguish between contract types and implications on account costing and billing.

TARGET AUDIENCE
This course is intended for those who perform one or more of the following roles:
• Performing indirect cost rate audits for A/E Design firms
• Ensuring compliance with the AASHTO Audit Guide
• Administering contracts or subcontracts and procuring services
• Managing contracts or subcontracts
• Ensuring compliance of contracts or subcontracts
• Providing oversight of local contracts or subcontracts
• Building and reviewing cost proposals
• Approving the payment of A/E design consultant invoices
• Auditing indirect cost and contract proposals
• Closing out and performing final reconciliations of contracts
• Designing and enforcing internal control systems
• Reviewing RFPs and contracts for government projects
• Sell A/E design services to State DOTs

TRAINING LEVEL: Intermediate

FEE: 2022: $600 Per Person; 2023: N/A

LENGTH: 12 HOURS (CEU: 1.4 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-231030

COURSE TITLE
Using the AASHTO Audit Guide for the Auditing and Oversight of A/E Consultant Indirect Cost Rates

SPECIAL NOTE ON REQUIRED PREREQUISITE: NHI-231029 AASHTO Uniform Audit and Accounting Guide Part 1 is a prerequisite for this course. Participants that have not successfully completed NHI-231029 will be turned away.

NOTE: This course was updated in 2019 and reflects the updated references of 23 CFR 172, 2 CFR 200, 2016 AASHTO Audit Guide, and the 2018 National Compensation Matrix.

This two-day advanced course is of interest to A/E design firms; State DOT and local government auditors; CPAs; and FHWA, State DOT, and A/E design firm financial and/or consultant services management who perform the audit or audit compliance review function in accordance with the AASHTO Uniform Audit & Accounting Guide (AASHTO Audit Guide). The course focuses primarily on audit requirements and procedures designed to develop reasonable assurance that indirect cost rates are developed in accordance with applicable Federal regulations and guidance. The course incorporates small- and large-group discussions, document reviews, case study activities, un-scored self-assessments, and a scored final assessment to reinforce learning.

OUTCOMES
Upon completion of the course, participants will be able to:

• Perform audit functions related to the planning, performance, or oversight of A/E consultant indirect cost rate audits.
• Determine and attest to A/E consultant compliance with applicable guidance and/or requirements.
• Discuss how State DOTs will use the CPA Workpaper Review Program (AASHTO Audit Guide Appendix A) to evaluate audits performed by CPAs.
• Identify and apply appropriate audit tools and techniques as specified in the AASHTO Audit Guide.
• Describe the components of a complete audit report and how to evaluate the report presentation.
• Describe various components of the State DOT's oversight and risk management framework.
• Describe at a high level the FHWA's roles and responsibilities in its stewardship and oversight of Federal-Aid funds related to procurement of A/E design services and administration of related agreements.

TARGET AUDIENCE
This course is primarily for those who perform one or more of the following functions:

• Perform indirect cost rate audits for A/E design firms
• Ensure consistency with the AASHTO Audit Guide
• Ensure compliance of contracts or subcontracts
• Provide oversight of local agency contracts or subcontracts
• Review cost proposals
• Audit indirect cost and contract proposals
• Close out and perform final reconciliation of contracts
• Design and enforce internal control systems
• Review RFPs and contracts for government projects
• Evaluate the effectiveness of the State DOT oversight and risk management framework

TRAINING LEVEL: Accomplished

FEE: 2022: $600 Per Person; 2023: $600 Per Person

LENGTH: 2 DAYS (CEU: 1.4 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-231030V

COURSE TITLE
Using the AASHTO Audit Guide for the Auditing and Oversight of A/E Consultant Indirect Cost Rates

SPECIAL NOTE ON REQUIRED PREREQUISITE: NHI-231029 AASHTO Uniform Audit and Accounting Guide Part 1 is a prerequisite for this course. Participants that have not successfully completed NHI-231029 will be turned away.

NOTE: This course was updated in 2019 and reflects the updated references of 23 CFR 172, 2 CFR 200, 2016 AASHTO Audit Guide, and the 2018 National Compensation Matrix.

This two-day advanced course is of interest to A/E design firms; State DOT and local government auditors; CPAs; and FHWA, State DOT, and A/E design firm financial and/or consultant services management who perform the audit or audit compliance review function in accordance with the AASHTO Uniform Audit & Accounting Guide (AASHTO Audit Guide). The course focuses primarily on audit requirements and procedures designed to develop reasonable assurance that indirect cost rates are developed in accordance with applicable Federal regulations and guidance. The course incorporates small- and large-group discussions, document reviews, case study activities, un-scored self-assessments, and a scored final assessment to reinforce learning.

OUTCOMES
Upon completion of the course, participants will be able to:
• Perform audit functions related to the planning, performance, or oversight of A/E consultant indirect cost rate audits.
• Determine and attest to A/E consultant compliance with applicable guidance and/or requirements.
• Discuss how State DOTs will use the CPA Workpaper Review Program (AASHTO Audit Guide Appendix A) to evaluate audits performed by CPAs.
• Identify and apply appropriate audit tools and techniques as specified in the AASHTO Audit Guide.
• Describe the components of a complete audit report and how to evaluate the report presentation.
• Describe various components of the State DOT’s oversight and risk management framework.
• Describe at a high level the FHWA’s roles and responsibilities in its stewardship and oversight of Federal-Aid funds related to procurement of A/E design services and administration of related agreements.

TARGET AUDIENCE
This course is primarily for those who perform one or more of the following functions:
• Perform indirect cost rate audits for A/E design firms
• Ensure consistency with the AASHTO Audit Guide
• Ensure compliance of contracts or subcontractors
• Provide oversight of local agency contracts or subcontractors
• Review cost proposals
• Audit indirect cost and contract proposals
• Close out and perform final reconciliation of contracts
• Design and enforce internal control systems
• Review RFPs and contracts for government projects
• Evaluate the effectiveness of the State DOT oversight and risk management framework

TRAINING LEVEL: Accomplished

FEE: 2022: $600 Per Person; 2023: N/A

LENGTH: 12 HOURS (CEU: 1.4 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-231033

COURSE TITLE
Public-Private Partnerships

COURSE RUNS FROM 1/2 DAY TO 3 DAYS DEPENDING UPON MODULES CHOSEN BY THE HOST. This course is available for all levels of learners: from basic to advanced knowledge in the subject area. The modular approach allows participants to benefit from a customized learning experience. Hosts may choose the basic course, the basic plus some intermediate or advanced lessons, or only more advanced topics—the choice is made to meet the needs of each agency with its own unique requirements! NOTE: The host must provide the classroom with computers, especially if an evaluation case study using P3-VALUE 2.0 is included in the host’s selection of modules. Please contact NHI for further information. NOTE: Minimum for basic or intermediate training is 20 participants; minimum for advanced training is 5 participants. Potential hosts should discuss maximum participation numbers with the instructor.

The FHWA Center for Innovative Finance Support has developed a series of training modules to provide information and tools that help participants improve their understanding of how to evaluate potential P3 proposals.

An FHWA-sponsored instructor will present in-person training at your site. The training is tailored to address the needs of each requesting agency. The agenda and training modules presented will be determined through a discussion with FHWA staff and an evaluation of needs. Depending upon the options selected, the training duration runs from 1/2 day to 3 full instructional days. The intent is to fit the training content and schedule to best meet the needs of an individual agency.

Available modules include:

INTRODUCTORY WORKSHOP
Module 1 Overview of P3s
Module 2 Successful P3 Practices

INTERMEDIATE WORKSHOP
Module 3 P3 Risk Allocation
Module 4 P3 Project Financing
Module 5 P3 Evaluation Overview
Module 6 P3 Model Contracts
Module 7A P3 Preparing for a P3 Procurement
Module 7B Key P3 Procurement Structuring Themes
Module 7C Key P3 Procurement Steps
Module 8 Tolling and Pricing

ADVANCED WORKSHOP
Module 9A Financial Viability Assessment
Module 9B Financial Viability Computer Exercise
Module 10A P3 Value for Money Analysis
Module 10B P3 Value for Money Computer Exercise
Module 11A P3 Benefit-Cost Assessment
Module 11B P3 Benefit-Cost Assessment Exercise
Module 12A Risk Assessment
Module 12B Risk Assessment Exercise
Module 13 Comprehensive Exercise using your project

The training is a mix of presentations, class discussions, and hands-on computer training using the P3-VALUE 2.0 tool, an Excel-based set of spreadsheets that provide a better way to understand the development and evaluation of P3 bids from the public and private sector perspectives.
OUTCOMES
Upon completion of the course, participants will be able to:
• better understand P3s and how to evaluate potential P3 proposals.
• explain the process for developing, procuring and implementing P3s.

TARGET AUDIENCE
State, regional, and local transportation officials may host this course for invited attendees.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $250 Per Person

LENGTH: 1 DAYS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 5; MAXIMUM: 40

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-231033V

COURSE TITLE
Public-Private Partnerships (Virtual Delivery of 231033)

COURSE RUNS FROM 1/2 DAY TO 3 DAYS DEPENDING UPON MODULES CHOSEN BY THE HOST. This course is available for all levels of learners: from basic to advanced knowledge in the subject area. The modular approach allows participants to benefit from a customized learning experience. Hosts may choose the basic course, the basic plus some intermediate or advanced lessons, or only more advanced topics—the choice is made to meet the needs of each agency with its own unique requirements! NOTE: The host must provide the classroom with computers, especially if an evaluation case study using P3-VALUE 2.0 is included in the host’s selection of modules. Please contact NHI for further information. NOTE: Minimum for basic or intermediate training is 20 participants; minimum for advanced training is 5 participants. Potential hosts should discuss maximum participation numbers with the instructor.

The FHWA Center for Innovative Finance Support has developed a series of training modules to provide information and tools that help participants improve their understanding of how to evaluate potential P3 proposals. An FHWA-sponsored instructor will present in-person training at your site. The training is tailored to address the needs of each requesting agency. The agenda and training modules presented will be determined through a discussion with FHWA staff and an evaluation of needs. Depending upon the options selected, the training duration runs from 1/2 day to 3 full instructional days. The intent is to fit the training content and schedule to best meet the needs of an individual agency.

Available modules include:

INTRODUCTORY WORKSHOP
Module 1 Overview of P3s
Module 2 Successful P3 Practices

INTERMEDIATE WORKSHOP
Module 3 P3 Risk Allocation
Module 4 P3 Project Financing
Module 5 P3 Evaluation Overview
Module 6 P3 Model Contracts
Module 7 Key P3 Procurement Steps
Module 8 Tolling and Pricing

ADVANCED WORKSHOP
Module 9A Financial Viability Assessment
Module 9B Financial Viability Computer Exercise
Module 10A P3 Value for Money Analysis
Module 10B P3 Value for Money Computer Exercise
Module 11A P3 Benefit-Cost Assessment
Module 11B P3 Benefit-Cost Assessment Exercise
Module 12 Comprehensive Exercise using your project

The training is a mix of presentations, class discussions, and hands-on computer training using the P3-VALUE 2.0 tool, an Excel-based set of spreadsheets that provide a better way to understand the development and evaluation of P3 bids from the public and private sector perspectives.

OUTCOMES
Upon completion of the course, participants will be able to:

• better understand P3s and how to evaluate potential P3 proposals.
• explain the process for developing, procuring and implementing P3s.
TARGET AUDIENCE
State, regional, and local transportation officials may host this course for invited attendees.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: N/A

LENGTH: 8 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 5; MAXIMUM: 40

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Managing Highway Contract Claims: Analysis and Avoidance

Construction contract claims are the result of the owner and the contractor being unable to come to agreement regarding an alleged change. Reducing or eliminating claims requires (1) a reduction in the number of potential changes, and (2) the implementation of practices that increase the likelihood of an owner and contractor resolving a dispute. This course provides the basic tools to address both elements of reducing or eliminating contract claims.

In this course, participants first walk step-by-step through the evaluation of a contract claim, looking at each component. Separate course modules are devoted to these three components of a claim: entitlement, impact, and cost. The “Entitlement” module focuses on the contract and the proper interpretation of common contract clauses. The “Impacts” module focuses on delay and inefficiency—the two most difficult impacts to measure and, consequently, most difficult to resolve. The “Cost” module explores costs that can prove difficult for the project team to resolve.

Next, the participants identify and review best practices associated with successful dispute resolution. In addition, there is a module devoted solely to claims avoidance techniques and dispute resolution processes.

By completing this course, participants will have the opportunity to master techniques that can help them manage and avoid claims.

OUTCOMES

Upon completion of the course, participants will be able to:

• Define “claim”
• List the three parts of a claim
• Describe the difference between a directed and constructive change
• List examples of directed and constructive changes
• List basic contract principles and rules of contract interpretation
• List the contract clauses most relevant to the evaluation of claims
• Define essential scheduling terms
• Explain the differences among the six types of delays
• List five methods for analyzing delays
• Explain how to perform a contemporaneous schedule analysis
• List five methods for measuring productivity/inefficiency
• Explain how to perform a measured mile analysis
• Describe how to avoid constructive acceleration
• List five methods for calculating costs
• List the four assumptions upon which a total cost calculation is based
• Identify project costs that are affected by delays
• Calculate extended home office overhead costs by the Eichleay and Canadian methods
• Identify acceleration costs
• Identify inefficiency costs
• Identify common miscellaneous costs
• Explain the key steps necessary to evaluate claims
• Describe the False Claims Act
• Demonstrate an ability to evaluate a contractor’s claim
• Describe FHWA policy regarding participation in paying damages for contractor claims
• Explain the importance of a claims avoidance system
• Describe a claims avoidance and dispute resolution system
• Explain the strengths and weaknesses of dispute review board

TARGET AUDIENCE
This an intermediate level course. It is designed specifically for State DOTs, but is also appropriate for LPOs and MPOs. It is a valuable course for contractors, design consultants, project managers, and attorneys involved in the evaluation, management, and resolution of disputes on highway construction projects.

TRAINING LEVEL: Intermediate

FEE: 2022: $800 Per Person; 2023: $900 Per Person

LENGTH: 2.5 DAYS (CEU: 1.5 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-134037V

Course Title
Managing Highway Contract Claims: Analysis and Avoidance (Virtual Delivery of 134037A)

NHI-134037A - Managing Highway Contract Claims: Analysis and Avoidance is now offered on-line as a virtual course. A virtual instructor-led training provides 100% remote learning while ensuring participants have access to expert instructors, workshop activities, and engaging peer-to-peer discussions. Register today and learn the principles of managing highway contract claims in the convenience of your home and/or office anywhere in the country, remotely.

Construction contract claims are the result of the owner and the contractor being unable to come to agreement regarding an alleged change. Reducing or eliminating claims requires (1) a reduction in the number of potential changes, and (2) the implementation of practices that increase the likelihood of an owner and contractor resolving a dispute. This course provides the basic tools to address both elements of reducing or eliminating contract claims and has been updated to include an increased focus on claims avoidance with improved examples and additional best practices with state-specific activity.

In this course, participants first walk step-by-step through the evaluation of a contract claim, looking at each component. Separate course modules are devoted to these three components of a claim: entitlement, impact, and cost. The “Entitlement” module focuses on the contract and the proper interpretation of common contract clauses. The “Impacts” module focuses on delay and inefficiency—the two most difficult impacts to measure and, consequently, most difficult to resolve. The “Cost” module explores costs that can prove difficult for the project team to resolve.

Next, the participants identify and review best practices associated with successful dispute resolution. In addition, there is a module devoted solely to claims avoidance techniques and dispute resolution processes.

By completing this course, participants will have the opportunity to master techniques that can help them manage and avoid claims.

Register today to learn best practices associated with successful managing construction contract claims in the convenience of your home and/or office anywhere in the country, remotely. Sessions are typically held as half-day events over four days.

Outcomes
Upon completion of the course, participants will be able to:
• Define common contract and construction management terms.
• Identify the three parts of a claim.
• Describe how to successfully evaluate change orders and potential disputes to reduce negative consequences for the agency.
• Identify procedures and techniques for avoiding claims.

Target Audience
This an intermediate level course. It is designed specifically for State DOTs, but is also appropriate for LPOs and MPOs. It is a valuable course for contractors, design consultants, project managers, and attorneys involved in the evaluation, management, and resolution of disputes on highway construction projects.

Training Level: Intermediate

Fee: 2022: $800 Per Person; 2023: $900 Per Person
Length: 16 Hours (CEU: 1.5 Units)
Class Size: Minimum: 20; Maximum: 32

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov

Web site: www.nhi.fhwa.dot.gov • E-mail: nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134069

COURSE TITLE
Ethics Awareness for the Transportation Industry

The training contains good practices from various agencies. The topics of discussion in this training are: conflict of interest, safety, fraud, falsification of documentation, reporting ethical concerns, gifts and favors, fairness, personal use of agency property, and consequences.

Not all State agencies’ codes of conduct are the same but they all demand similar ethical behavior of their employees. Be sure to access to your agency's codes or check with your supervisor for more information specific to your organization. Each State agency/company has its own work rules, which the viewer needs to review and follow.

This training is provided in partnership with the Transportation Curriculum Coordination Council (TCCC) to provide good practices for ethical behavior of transportation employees. The training was prepared by State DOT personnel for State DOT personnel. This course is primarily intended for inspectors and technicians.

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe agency expectations on ethics
• Give an example of a current code of conduct policy
• Recognize and practice good ethics as an employee in the transportation industry
• Explain the consequences when rules and regulations are not followed

TARGET AUDIENCE
This training is designed for Level I and Level II State and local public agency personnel and their industry counterparts involved in the construction, maintenance and testing process for highways and structures. Level I or Entry refers to employees/ trainees with little to no experience in the subject area and perform his/her activities under direct supervision. Level II or Intermediate refers to employees that understand and demonstrate skills in one or more areas of the entry level and perform specific tasks under general supervision.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-134205

COURSE TITLE
Probabilistic Risk-Based Estimating for Highway Project Cost and Schedule

This course is an interactive eBook that provides you an awareness of concepts and processes utilized to successfully implement probabilistic risk-based estimating (PRBE). Participants will use the eBook as a reference to understand basic terminology and recognize good practices when structuring a project for risk assessment. This interactive eBook allows participants to relate basic concepts and processes to real-world examples, case studies, and challenges.

The purpose of this course is to help participants acquire knowledge to improve timely project delivery and limit the costs and delays associated with inaccurate cost and schedule estimation, as well as to help participants realize the potential benefits of a well-constructed, thoroughly reviewed, and properly communicated PRBE estimate. Participants will understand the need for PRBE, recognize how to conduct a successful PRBE risk workshop to support risk analysis, and use results to enhance project delivery by reducing risks to project cost and schedule objectives.

By acquiring new skills, the participants will improve their ability to manage project cost and schedule. Examples of these capabilities include:

- Understanding the need for PRBE.
- Using PRBE results to enhance project delivery.
- Properly setting up and structuring a cost estimate for risk analysis.
- Utilize risk assessment to develop reliability estimates of cost and schedule and identify significant project risks
- Presenting risk workshop results to leadership for improved decision-making.
- Recognizing how to set up a successful risk workshop for input to risk assessment.

After completing the self-paced eBook, participants return to their NHI My Training page to complete the exam and receive a certificate of completion and CEUs.

OUTCOMES
Upon completion of the course, participants will be able to:

1.1 Describe the relationship between project management, risk management, and PRBE.
1.2 Compare traditional and risk-based estimating.
1.3 Describe how PRBE results can be used to effectively manage a project.
1.4 Identify key benefits of PRBE to agency leadership and the public.
1.5 Explain the benefits of using PRBE results.
2.1 Compare traditional estimating to PRBE.
2.2 Describe the four basic components of uncertainty.
2.3 Define risk, likelihood, and impact.
2.4 Describe the difference between dependency and correlation.
2.5 Differentiate the approaches to “minor” and “significant” risk.
2.6 Describe how uncertainty is expressed through base estimate.
2.7 Explain the purpose of the forecast chart.
2.8 Describe the types of risks appropriate for the risk register and how they may be assessed.
2.9 Describe at least three types of risk response.
2.10 Provide an example of criteria used to accept risk.
2.11 Describe a method used to prioritize risk.
3.1 Describe what is meant by “basis of estimate.”
3.2 Define base estimate.
• 3.3 Evaluate a given project delivery schedule and define the different cost phases (design, right-of-way (ROW), and construction) and segments for analysis.
• 3.4 Describe two significant components of base uncertainty.
• 3.5 Compare top-down versus bottom-up base variability.
• 3.6 Differentiate the modeling approach to market conditions and inflation.
• 3.7 Identify three methods of risk identification.
• 3.8 Identify at least four types of bias.
• 3.9 Evaluate PRBE results to enhance project delivery.
• 3.10 Describe how significant risks are represented in risk-based results.
• 3.11 Compare low-probability and high-impact risk versus high-probability and high-impact risk.
• 3.12 List common PRBE outputs.
• 4.1 Describe the elements of an effective risk workshop.
• 4.2 Apply scalability factors for a given workshop scenario.
• 4.3 Explain how PRBE results can be used to treat risk.
• 4.4 Identify key participants in a risk workshop and describe their responsibilities.
• 4.5 Describe how the impact of uncertainty can be assessed by subject matter experts.
• 4.6 Explain what is meant by “conditioning” workshop participants.
• 4.7 Verify risk workshop results.
• 4.8 Identify the components of an effective PRBE presentation

TARGET AUDIENCE
The target audience includes DOTs and FHWA Division Offices. The primary target audience for this eBook includes DOT and FHWA staff, including planners, project managers, and cost-estimate staff, as well as Headquarters’ engineers and region- or district-level engineers. Secondary target audiences may include State subject matter experts in the areas of real estate, environment, construction, and geo-technology. Additionally, large local agencies and consultants working for contractors or the agencies part of the project delivery team could benefit from this eBook.

TRAINING LEVEL: Intermediate

FEE: 2022: $50 Per Person; 2023: $0 Per Person

LENGTH: 10 HOURS (CEU: 1 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-136106A

Course Title
Introduction to Transportation Asset Management with Workshop

“An Introduction to Transportation Asset Management” was updated in Fall of 2017 to reflect the Asset Management Rule (23 CFR part 515) and includes a summary of specific provisions related to asset management. Whether your agency is focused on meeting current requirements or planning for future enhancements and implementation, this course can help you meet those challenges!

Stakeholders today demand transparency in the transportation agency’s decision process; meanwhile, the agency faces higher expectations for customer service with fewer available resources. Transportation asset management (TAM) is a strategic approach to managing physical transportation infrastructure. The TAM environment promotes effective use of funding and can provide a method for defending the need for additional resources because it uses reliable data and a clear set of expected performance metrics to guide investment decisions and identify required resources.

NHI 136106A is a 1.5-day course that covers the principles of TAM and introduces the core questions every agency should be able to answer about its assets. Join this class to participate in a series of workshops that help you apply asset management principles to real-life situations. You’ll also find an agency assessment tool that can be used to identify gaps between the desired and actual use of TAM principles. Other topics introduced in this course include: asset management principles; performance management; long-term financial planning; risk assessment; and implementation.

This course is a prerequisite for NHI 136106B “Development of a Transportation Asset Management Plan.” You may also be interested in NHI 136106C “Introduction to Transportation Asset Management Plans,” which is a Web-based training. See the NHI website for additional information on each of these courses.

Outcomes
Upon completion of the course, participants will be able to:

• Champion the use of asset management principles and concepts within the organization
• Define their role in supporting the agency’s asset management efforts
• Identify the strengths and weaknesses of your agency’s asset management program
• Identify strategies for advancing your agency’s use of asset management principles

Target Audience
This training is designed for senior-level and mid-level managers from State departments of transportation and other transportation agencies, who typically have the responsibility for decision-making in one or more areas addressed by transportation asset management. Participants should represent a number of organizational units, including (but not limited to) planning, engineering (e.g., facility management, design, construction), capital programming, maintenance and operations, financial management, traffic and safety engineering, system operation and management, and information technology. The course is also intended for individuals who manage or provide critical information to senior managers, or who have direct responsibility for meeting specific transportation system performance or program delivery targets.

Training Level: Basic

Fee: 2022: $500 Per Person; 2023: $500 Per Person

Length: 1.5 Days (CEU: 0 Units)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-136106B

COURSE TITLE
Developing a Transportation Asset Management Plan

“Developing a Transportation Asset Management Plan” was updated in Fall of 2017 to reflect the Asset Management Rule (23 CFR part 515) and incorporate recent FHWA guidance on risk management, life-cycle planning, and financial planning. Case studies and sample plans were updated in 2020.

The class combines a brief (1-hour) Web-based training prerequisite with a 1.5-day instructor-led session to introduce the role of the Transportation Asset Management Plan (TAMP) as a planning, communication, and accountability tool. You will encounter lessons focusing on three primary components to the TAMP, including strategic performance management, risk assessment, and financial management. The workshops throughout the course allow you to work through real-life examples and practice skills, such as setting strategies. You’ll find a variety of resources, tools, and guidelines for use in developing a TAMP.

This course is the second in a series of courses on transportation asset management. All participants registering for this course must have completed the prerequisite NHI 136106A An Introduction to Transportation Asset Management or have demonstrated a solid background in transportation asset management principles and planning. In any event, all participants must successfully complete the Web-based training 136106C. The Web-based training is available at no additional charge and can be accessed via the NHI website.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the role of a Transportation Asset Management Plan in a transportation agency.
• Identify strategies for incorporating risk into investment decisions.
• Explain how to determine whether an agency is making sustainable, long-term investments in its assets.
• Develop a Transportation Asset Management Plan that matches the amount of data and the sophistication of the analysis tools available.

TARGET AUDIENCE
The course is intended for senior-level and mid-level managers from State departments of transportation and other transportation agencies, who have the responsibility for decision-making in one or more areas addressed by transportation asset management. Course participants should represent a broad range of organizational units, such as (but not limited to) planning, engineering (facility management, design, and construction), capital programming, maintenance and operations, financial management, traffic and safety engineering, system operation and management, and information technology. If the agency has an Asset Management Steering Committee, its members would benefit from this course. In addition, individuals who manage individual assets or provide critical information to senior managers, or who have direct responsibility for meeting specific transportation system performance or program delivery targets, are also excellent candidates for attending the course.

TRAINING LEVEL: Intermediate

FEE: 2022: $500 Per Person; 2023: $500 Per Person
LENGTH: 1.5 DAYS (CEU: 1 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-136106C

Course Title
Introduction to a Transportation Asset Management Plan

This training is a prerequisite of another NHI training and is offered at no cost.

A Transportation Asset Management Plan (TAMP) can be considered a business plan that builds the case for making infrastructure investments and explains how resources will be used. This course, “Introduction to a Transportation Asset Management Plan,” is a 1-hour, Web-based training (WBT) that introduces the content and organization of a TAMP and the typical TAMP development process. This course was previously cataloged under 131106C.

This training includes the following topics:
- The use of a TAMP in transportation agencies
- The typical content of a TAMP (including a comparison with requirements in MAP-21)
- Key components, including performance projections and the financial summary
- Examples of TAMPs at various levels of maturity
- Existing and anticipated use of a TAMP in state highway agencies
- The expected involvement of agency personnel in developing and updating a TAMP

This training includes audio clips from leaders in state highway agencies that convey the anticipated benefits from the development of a TAMP and the way they expect to use their TAMP. In addition, the WBT highlights the use of existing documentation to develop the TAMP and plans for enhancing the content of future TAMPs.

This training serves as a prerequisite for NHI-136106B “Developing a Transportation Asset Management Plan”, which describes the role of a TAMP in a transportation agency and explores in some detail three important components: strategic performance management, risk assessment and management, and financial management.

Outcomes
Upon completion of the course, participants will be able to:
- Describe the role of a TAMP as a communication tool with internal and external stakeholders.
- List the typical content of a TAMP.
- Identify several sources of information that will contribute to the development of a TAMP.

Target Audience
The course is intended for senior-level and mid-level managers from State departments of transportation and other transportation agencies, who typically have the responsibility for decision-making in one or more areas addressed by transportation asset management. Participants should represent a number of organizational units, including (but not limited to) planning, engineering (e.g., facility management, design, construction), capital programming, maintenance and operations, financial management, traffic and safety engineering, system operation and management, and information technology. The course is also intended for individuals who manage or provide critical information to senior managers, or who have direct responsibility for meeting specific transportation system performance or program delivery targets.

Training Level: Intermediate
FEE: 2022: $0 Per Person; 2023: $0 Per Person
LENGTH: 1 HOURS (CEU: 0 UNITS)
CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Introduction to Transportation Asset Management with Workshop (Virtual Delivery of 136106A)

“An Introduction to Transportation Asset Management” was updated in Fall of 2017 to reflect the Asset Management Rule (23 CFR part 515) and includes a summary of specific provisions related to asset management. Whether your agency is focused on meeting current requirements or planning for future enhancements and implementation, this course can help you meet those challenges!

Stakeholders today demand transparency in the transportation agency’s decision process; meanwhile, the agency faces higher expectations for customer service with fewer available resources. Transportation asset management (TAM) is a strategic approach to managing physical transportation infrastructure. The TAM environment promotes effective use of funding and can provide a method for defending the need for additional resources because it uses reliable data and a clear set of expected performance metrics to guide investment decisions and identify required resources.

NHI 136106A is a 1.5-day course that covers the principles of TAM and introduces the core questions every agency should be able to answer about its assets. Join this class to participate in a series of workshops that help you apply asset management principles to real-life situations. You’ll also find an agency assessment tool that can be used to identify gaps between the desired and actual use of TAM principles. Other topics introduced in this course include: asset management principles; performance management; long-term financial planning; risk assessment; and implementation.

This course is a prerequisite for NHI 136106B “Development of a Transportation Asset Management Plan.” You may also be interested in NHI 136106C “Introduction to Transportation Asset Management Plans,” which is a Web-based training. See the NHI website for additional information on each of these courses.

NHI-136106A- Introduction to Transportation Asset Management with Workshop is now offered on-line as a virtual course. A virtual instructor-led training provides 100% remote learning while ensuring participants have access to expert instructors, workshop activities, and engaging peer-to-peer discussions. Sessions are typically held as half-day events over three days.

Register today to learn the principles of Transportation Asset Management in the convenience of your home and/or office anywhere in the country, remotely.

OUTCOMES

Upon completion of the course, participants will be able to:

• Champion the use of asset management principles and concepts within the organization.
• Define their role in supporting the agency’s asset management efforts
• Identify the strengths and weaknesses of your agency’s asset management program
• Identify strategies for advancing your agency’s use of asset management principles

TARGET AUDIENCE

This training is intended for senior-level and mid-level managers from State departments of transportation and other transportation agencies, who typically have the responsibility for decision-making in one or more areas addressed by transportation asset management. Participants should represent a number of organizational units, including (but not limited to) planning, engineering (e.g., facility management, design, construction), capital programming, maintenance and operations, financial management, traffic and safety engineering, system operation and management, and information technology. The course is also intended for individuals who manage or provide critical information to senior managers, or who have direct responsibility for meeting specific transportation system performance or program delivery targets.
TRAINING LEVEL: Basic

FEE: 2022: $500 Per Person; 2023: $500 Per Person

LENGTH: 12 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-136106W

COURSE TITLE
Developing a Transportation Asset Management Plan (Virtual Delivery of 136106B)

“Developing a Transportation Asset Management Plan” was updated in Fall of 2017 to reflect the Asset Management Rule (23 CFR part 515) and incorporate recent FHWA guidance on risk management, life-cycle planning, and financial planning. Case studies and samples plans were updated in 2020.

The class combines a brief (1-hour) Web-based training prerequisite with a 1.5-day online instructor-led session to introduce the role of the Transportation Asset Management Plan (TAMP) as a planning, communication, and accountability tool. You will encounter lessons focusing on three primary components to the TAMP, including strategic performance management, risk assessment, and financial management. The workshops throughout the course allow you to work through real-life examples and practice skills, such as setting strategies. You’ll find a variety of resources, tools, and guidelines for use in developing a TAMP.

This course is the second in a series of courses on transportation asset management. All participants registering for this course must have completed the prerequisite NHI-136106A or NHI-136106V - An Introduction to Transportation Asset Management or have demonstrated a solid background in transportation asset management principles and planning. In any event, all participants must successfully complete the Web-based training 136106C. The Web-based training is available at no additional charge and can be accessed via the NHI website.

Sessions are typically held as half-day events over three days. Register today to attend this course in the convenience of your home and/or office anywhere in the country, remotely.

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe the role of a Transportation Asset Management Plan in a transportation agency.
• Identify strategies for incorporating risk into investment decisions.
• Explain how to determine whether an agency is making sustainable, long-term investments in its assets.
• Develop a Transportation Asset Management Plan that matches the amount of data and the sophistication of the analysis tools available.

TARGET AUDIENCE
The course is intended for senior-level and mid-level managers from State departments of transportation and other transportation agencies, who have the responsibility for decision-making in one or more areas addressed by transportation asset management. Course participants should represent a broad range of organizational units, such as (but not limited to) planning, engineering (facility management, design, and construction), capital programming, maintenance and operations, financial management, traffic and safety engineering, system operation and management, and information technology. If the agency has an Asset Management Steering Committee, its members would benefit from this course. In addition, individuals who manage individual assets or provide critical information to senior managers, or who have direct responsibility for meeting specific transportation system performance or program delivery targets, are also excellent candidates for attending the course.

TRAINING LEVEL: Intermediate

FEE: 2022: $500 Per Person; 2023: $500 Per Person

LENGTH: 12 HOURS (CEU: 1 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-136113

Course Title
Transportation Asset Management Overview

This training was developed by the Transportation Curriculum Coordination Council (TCCC) in partnership with AASHTO and NHI. This training explains the basics of asset management and why asset management is important. After you complete this training, you’ll have new terms, and new ways of thinking about what you’re already doing. More importantly, you’ll understand why it’s so important to be strategic and systematic when you’re responsible for managing huge numbers of assets.

This training contains the following lessons:

Lesson 1: What is Transportation Asset Management? This lesson will explain the concept of asset management; give examples of how asset management is used in the planning process; and explain how current asset management practices have been impacted by past transportation needs.

Lesson 2: Asset Management Principles and Practices. This lesson lists the categories of activity that inform spending decisions; explain how policy goals and objectives impact asset management; relate planning and programming to managing assets; describe how asset management principles apply to program delivery; explain why system monitoring is necessary; and explain how quality data and analysis impact asset management.

Outcomes
Upon completion of the course, participants will be able to:

• Explain what transportation asset management is and why it is important
• Describe the asset management principles and practices used to make informed spending decisions

Target Audience
This training was developed by the Transportation Curriculum Coordination Council (TCCC) in partnership with AASHTO, NHI, and is recommended for TCCC levels II through IV.

Training Level: Basic

Fee: 2022: $25 Per Person; 2023: $0 Per Person

Length: 2 HOURS (CEU: 0 UNITS)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-310065

Course Title
Risk Management

Managing transportation networks—including agency management, program development, and project delivery—is extremely complex and fraught with uncertainty. Any agency can use risk management as the Federal Highway Administration (FHWA) does: to focus limited resources; strengthen its ability to prioritize; and improve communication and foster transparent leadership.

In this 2-day, instructor-led class, participants are exposed to the principles, tools, and techniques used to identify, prioritize, respond to, and monitor risk. They learn to apply these risk management tools and techniques at any level of an organization (enterprise, program, project, or activity). Throughout the course, participants answer the following questions.

1. What is risk?
2. Why should programs be risk-based?
3. What should program managers know about the results of risk analysis, risk statements and responses, strategies, and tracking of implementation?
4. How can risks be measured?
5. How is risk management tied to strategic planning (especially with performance measures)?

This training event combines limited instructor presentations with robust group discussions and multiple team-based exercises. Course material is based on FHWA generally accepted risk management principles and practice. Teams of participants work on agency-specified objectives to identify and manage risks. They leave class with work products including a risk register template and other tools for identifying, prioritizing, and responding to risk.

NOTE: Participants use tools and methods from each step of the risk management framework in a series of exercises that provide realistic, job-relevant practice in applying the risk management process. In order to maximize the impact of the training and increase the likelihood of participants’ mastery of the risk management process, the agency can select active agency issues (project, program, or network) for use during the exercises. In addition, the agency can provide problem statements and pre-select the teams for the exercises.

Outcomes

Upon completion of the course, participants will be able to:

• Recognize the connection between effective risk management and achieving organizational objectives.
• Follow the steps of the risk management process to identify and develop risk strategies.
• Apply the risk management process to one’s own level of decision-making within an organization.

Target Audience

The target audience for this course includes Federal, State and local highway employees who are responsible for directing and managing any aspects of highway-related programs and projects such as planning, environment, project development, design, construction, operations, maintenance, and finance. Asset management practitioners may also find this course content helpful as they develop their asset management plans. Audience experience, background, knowledge, skills and abilities will vary. No previous experience with risk management is required.

Training Level: Basic

Fee: 2022: $650 Per Person; 2023: $650 Per Person

Length: 2 DAYS (CEU: 1.3 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-310065A

COURSE TITLE
Risk Management Executive Summary
This 1-day training is an overview of FHWA-NHI-134065 and covers principles of risk management.

OUTCOMES
Upon completion of the course, participants will be able to:
• Explain the overall organizational context, importance of risk management, and risk framework to others
• Follow a consistent process for managing risk
• Utilize standard risk terminology, tools and methods
• Implement appropriate risk identification techniques
• Write an effective and meaningful risk statement
• Accurately estimate likelihood and impact of each risk event
• Create a consistent matrix to prioritize risk

TARGET AUDIENCE
The target audience for this course includes Federal, State and local highway managers and executives who are responsible for directing and managing all aspects of highway related programs/projects such as planning, environment, project development, design, construction, operations, maintenance, and finance.

TRAINING LEVEL: Basic

FEE: 2022: $275 Per Person; 2023: $275 Per Person

LENGTH: 3 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 18; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-310109

Course Title
Federal-Aid 101 (Federal Version)

During this time of economic expansion and growth, there are dramatic workforce changes taking place. Given the increasing demand by our partners and customers for more technical assistance, FHWA needs to develop the knowledge of their new/mid-career hires in the area of the Federal-aid processes and regulations.

Therefore, the overall course goal is to provide FHWA employees, particularly mid-career hires, with an overview of the key elements of the Federal-Aid Highway Program. Specifically, this course focuses on general requirements and laws that govern the Federal-Aid Highway Program, processes and procedures followed in the project development, and identifying flexibility inherent in the Federal-Aid Program.

Outcomes
Upon completion of the course, participants will be able to:

• Identify the elements and project milestones of the Federal-Aid Highway program.
• Describe the financial aspects and requirements of the Federal-Aid Highway program.
• Describe how the Federal-Aid Highway program fits with other laws (23 U.S.C and other laws that affect the Federal-Aid Highway program).
• Identify the requirements for using Federal-Aid Highway funding.
• Identify how FHWA initiatives such as civil rights, safety, and innovative financing impact the Federal-Aid Highway program.
• Explain the risk-based stewardship and oversight approach,
• Identify key responsibilities or elements of the risk-based stewardship and oversight approach.
• Identify the flexibility inherent in the Federal-Aid Highway program.

Target Audience
New/mid career hires from all disciplines (i.e., planners, engineers, environmental specialists, financial specialists or managers).

Training Level: Intermediate

Fee: 2022: $580 Per Person; 2023: $580 Per Person

Length: 3 DAYS (CEU: 2.1 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-310110

Course Title
Federal-Aid Highways - 101 (State Version)

Course Goal
The purpose of this course is to introduce the participants to the Federal-aid Highway Program (FAHP) and to give them a basic understanding of the major aspects of the program. While some of this information may not be new to all participants, this course will focus on using the presented KSA’s (knowledge, skills and abilities) to enable the participants to perform their job more effectively and to make more informed decisions regarding the FAHP.

This update of Federal-aid 101 for States includes supplemental information on the impacts of the Fixing America’s Surface Transportation Act, or “FAST Act.” On December 4, 2015, the President signed the first Federal law in over ten years to provide long-term funding certainty for surface transportation. The FAST Act authorizes $305 billion over fiscal years 2016 through 2020 for the highway and motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs. With its enactment, States and local governments could now move forward with critical transportation projects, like new highways and transit lines, with the confidence that they would have a Federal partner over the long term.

Outcomes
Upon completion of the course, participants will be able to:

• Identify the elements and project development phases of the Federal-aid Highway Program
• Describe the financial aspects and requirements of the Federal-aid Highway Program
• Describe how the Federal-aid Highway Program fits with other laws (23 U.S.C. and other laws that affect the Federal-aid Highway Program)
• Identify the requirements and key approval points for using Federal-aid Highway funding
• Identify how Federal initiatives such as civil rights, safety, and innovative financing impact the Federal-aid Highway Program
• Explain the function of the Stewardship & Oversight Agreement
• Identify the flexibility inherent in the Federal-aid Highway Program

Target Audience
The two target audiences for Federal-aid 101 for States are:

State highway officials (new hires and new-to-role personnel, among others) and

Local Public Agency (LPA) highway officials (public works directors, finance department personnel, and counterparts to State participants, among others).

Training Level: Intermediate

Fee: 2022: $400 Per Person; 2023: $400 Per Person

Length: 2 DAYS (CEU: 1.2 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-310110V

Course Title
Federal-Aid Highways - 101 (State Version) (VIRTUAL DELIVERY)

Course Goal
The purpose of this course is to introduce the participants to the Federal-aid Highway Program (FAHP) and to give them a basic understanding of the major aspects of the program. While some of this information may not be new to all participants, this course will focus on using the presented KSA’s (knowledge, skills and abilities) to enable the participants to perform their job more effectively and to make more informed decisions regarding the FAHP.

This update of Federal-aid 101 for States includes supplemental information on the impacts of the Fixing America’s Surface Transportation Act, or “FAST Act.” On December 4, 2015, the President signed the first Federal law in over ten years to provide long-term funding certainty for surface transportation. The FAST Act authorizes $305 billion over fiscal years 2016 through 2020 for the highway and motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs. With its enactment, States and local governments could now move forward with critical transportation projects, like new highways and transit lines, with the confidence that they would have a Federal partner over the long term.

Outcomes
Upon completion of the course, participants will be able to:

• Identify the elements and project development phases of the Federal-aid Highway Program
• Describe the financial aspects and requirements of the Federal-aid Highway Program
• Describe how the Federal-aid Highway Program fits with other laws (23 U.S.C. and other laws that affect the Federal-aid Highway Program)
• Identify the requirements and key approval points for using Federal-aid Highway funding
• Identify how Federal initiatives such as civil rights, safety, and innovative financing impact the Federal-aid Highway Program
• Explain the function of the Stewardship & Oversight Agreement
• Identify the flexibility inherent in the Federal-aid Highway Program

Target Audience
The two target audiences for Federal-aid 101 for States are: State highway officials (new hires and new-to-role personnel, among others) and Local Public Agency (LPA) highway officials (public works directors, finance department personnel, and counterparts to State participants, among others).

Training Level: Intermediate

Fee: 2022: $400 Per Person; 2023: $400 Per Person

Length: 12 HOURS (CEU: 1.2 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-310119

Course Title
Writing Effective Program Review Reports: Moving People to Action

The ability to provide clear communication is vital to the business of FHWA and good writing skills are a key element in the communication process. FHWA uses program reviews as tools to fulfill its stewardship and oversight responsibilities, manage program risk, and identify process improvements for the Federal-aid program. Each year, FHWA conducts approximately 200 program reviews. The product of these reviews is usually a review that details the observations and recommendations of the review team in an effort to improve a process or product. The review's effectiveness is largely determined by how well the review is communicated to the target audience.

The goal of this course is to improve the writing skills of FHWA's employees. Improved writing skills should lead to higher quality review reviews, which in turn should increase FHWA's ability to motivate the reading audience to act upon the review's recommendations. Action on the part of the reader will ultimately lead to improved effectiveness in delivering FHWA programs by reducing costs, accelerating project delivery, and improving stewardship and oversight. Throughout this course, you will learn that effective writing is more than proper punctuation and using spell-check. It's learning how to write for your audience, the busy reader. You will also learn writing skills that will aid in motivating your readers to action.

Outcomes
Upon completion of the course, participants will be able to:

• write an executive summary that informs the audience about potential problems and persuades them to act on your recommendations or solution;
• write recommendations that motivate the audience to take corrective action;
• discuss usefulness and readability;
• describe how review content is generated by questions;
• develop and answer review objectives;
• evaluate the logical link of review objectives, observations, and recommendations;
• focus on the relevant elements of an observation finding to create convincing support;
• use the deductive message-first structure throughout reviews;
• design/organize reviews to benefit the busy reader;
• control paragraph unity (one main topic) and coherence (flow);
• avoid information overload within sentences;
• control common sentence problems; and
• develop objective criteria for writing and reviewing reviews.

Target Audience
This course is primarily intended for FHWA personnel who are responsible for writing program reviews. It is anticipated that participants may not have in-depth writing background. More knowledgeable persons may be expected to attend and will add to the overall effectiveness of the training through their active participation.

Training Level: Intermediate

Fee: 2022: $400 Per Person; 2023: $450 Per Person

Length: 1.5 DAYS (CEU: 0 UNITS)

Class Size: Minimum: 22; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-310119V

Course Title
Writing Effective Program Review Reports: Moving People to Action (Virtual Delivery)

This course is delivered as a virtual delivery.

The ability to provide clear communication is vital to the business of FHWA and good writing skills are a key element in the communication process. FHWA uses program reviews as tools to fulfill its stewardship and oversight responsibilities, manage program risk, and identify process improvements for the Federal-aid program. Each year, FHWA conducts approximately 200 program reviews. The product of these reviews is usually a review that details the observations and recommendations of the review team in an effort to improve a process or product. The review's effectiveness is largely determined by how well the review is communicated to the target audience.

The goal of this course is to improve the writing skills of FHWA's employees. Improved writing skills should lead to higher quality review reviews, which in turn should increase FHWA's ability to motivate the reading audience to act upon the review’s recommendations. Action on the part of the reader will ultimately lead to improved effectiveness in delivering FHWA programs by reducing costs, accelerating project delivery, and improving stewardship and oversight. Throughout this course, you will learn that effective writing is more than proper punctuation and using spell-check. It’s learning how to write for your audience, the busy reader. You will also learn writing skills that will aid in motivating your readers to action.

Outcomes
Upon completion of the course, participants will be able to:

• write an executive summary that informs the audience about potential problems and persuades them to act on your recommendations or solution;
• write recommendations that motivate the audience to take corrective action;
• discuss usefulness and readability;
• describe how review content is generated by questions;
• develop and answer review objectives;
• evaluate the logical link of review objectives, observations, and recommendations;
• focus on the relevant elements of an observation finding to create convincing support;
• use the deductive message-first structure throughout reviews;
• design/organize reviews to benefit the busy reader;
• control paragraph unity (one main topic) and coherence (flow);
• avoid information overload within sentences;
• control common sentence problems; and
• develop objective criteria for writing and reviewing reviews.

Target Audience
This course is primarily intended for FHWA personnel who are responsible for writing program reviews. It is anticipated that participants may not have in-depth writing background. More knowledgeable persons may be expected to attend and will add to the overall effectiveness of the training through their active participation.
TRAINING LEVEL: Intermediate

FEE: 2022: $400 Per Person; 2023: $400 Per Person

LENGTH: 6 HOURS (CEU: .9 UNITS)

CLASS SIZE: MINIMUM: 22; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-310120

COURSE TITLE
Conducting Effective Program Reviews

This course was substantially updated in November 2017 to provide a more focused step-based approach to the program review process.

‘Conducting Effective Program Reviews’ is a 2-Day Instructor-led Training (ILT) course offered by NHI, the authoritative source in transportation training.

To accomplish FHWA's Stewardship Mission, units at every level and in every program area need the expertise to (often jointly with partners) plan, design, and carry out reviews to ensure that operational processes are consistent with established standards and expectations, performing at the most effective and efficient level, and that best practices are captured and made available to units at all levels.

Building on FHWA experience and expertise gained through Program Reviews, Process Reviews, and Continuous Process Improvement Reviews, this two-day workshop provides instruction, consultation, and hands-on assistance in the methodology and tools for conducting program reviews that get results.

The course is organized around seven main lessons, which follow the seven steps of the program review process: 1) Establish Objectives, 2) Plan the Review, 3) Collect Data, 4) Analyze Data, 5) Develop Observations and Recommendations, 6) Write the Report and Communicate Results, and 7) Monitor Implementation of Recommendations.

This course was substantially updated in November 2017 to provide a more focused step-based approach to the program review process.

This course combines instructor presentation with group discussions and group activities. Participants take a written assessment at the end of the course.

Participants will take home a participant workbook containing ample background notes, plus the “Program Review Process Primer,” which recaps the main points of each review process step.

To enroll in this Instructor-led Training course, click the ‘View Sessions’ button and click ‘Add To Cart’ next to your session choice. If there are no upcoming sessions, click ‘Sign Up for Session Alerts.’

Any organization can host this course. To host this course and bring training to your organization, click the ‘Host this Course’ button.

OUTCOMES
Upon completion of the course, participants will be able to:

• Discuss the purpose of program reviews
• Develop a Charter, including review objectives
• Develop a Review Plan, including the steps for data collection
• Collect and document the appropriate review data
• Select and employ data analysis tools to interpret and present review data
• Develop an effective observation and link it to an objective and recommendation
• Write a program Review Report and conduct an effective close-out meeting
• Use the Review Response Tracker to monitor the implementation of recommendations

TARGET AUDIENCE
The target audience for this Instructor-led Training course includes FHWA staff who participate in and/or lead program or process reviews. As such, the target staff will primarily come from the division offices, but may include staff from FHWA headquarters, State DOTs, or the Resource Centers (RC).
TRAINING LEVEL: Basic

FEE: 2022: $500 Per Person; 2023: $550 Per Person

LENGTH: 2 DAYS (CEU: 1.3 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-310123

COURSE TITLE
FHWA Basic Contracting Officers Representative (COR) Training

Contracting Officer’s Representatives (COR) are integral to the acquisition process and perform critical acquisition functions; FHWA relies on CORs to help the Contracting Officer (CO) monitor work conducted under contracts in order to meet the Agency mission. Because of this important role, FHWA needs to develop the knowledge of their new and mid-career hires in the area of acquisition management.

The overall course goal is to address the essential core competencies, outlined by the Office of Federal Procurement Policy (OFPP), required for CORs to effectively monitor Federal Government contracts. The class is tailored to meet the specific needs of FHWA CORs with examples and content directed to common contract types and issues faced by FHWA and Federal Lands Programs.

Participants who successfully complete the course will earn 40 Continuous Learning Points in support of a Level II FAC-COR certification.

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain the duties and responsibilities of the Contracting Officer’s Representative (COR)
• Discuss COR best practices
• Define key acquisition terminology
• Associate the importance of professional business skills with effectively monitoring the work under the contract
• Determine the elements of contract monitoring appropriate for a given contract
• Describe the process leading up to contract award
• Appropriately respond to legal and ethical issues that may arise

TARGET AUDIENCE
New/mid-career hires who anticipate being appointed as a COR. Agreement Officer’s Technical Representatives, persons monitoring task orders under an Indefinite Delivery/Indefinite Quantity contract, and anyone desiring Basic COR Training.

TRAINING LEVEL: Basic

FEE: 2022: $650 Per Person; 2023: $700 Per Person

LENGTH: 5 DAYS (CEU: 3 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-310123V

COURSE TITLE
FHWA Basic Contracting Officers Representative (COR) Training (VIRTUAL DELIVERY)

Contracting Officer's Representatives (COR) are integral to the acquisition process and perform critical acquisition functions; FHWA relies on CORs to help the Contracting Officer (CO) monitor work conducted under contracts in order to meet the Agency mission. Because of this important role, FHWA needs to develop the knowledge of their new and mid-career hires in the area of acquisition management.

The overall course goal is to address the essential core competencies, outlined by the Office of Federal Procurement Policy (OFPP), required for CORs to effectively monitor Federal Government contracts. The class is tailored to meet the specific needs of FHWA CORs with examples and content directed to common contract types and issues faced by FHWA and Federal Lands Programs.

Participants who successfully complete the course will earn 40 Continuous Learning Points in support of a Level II FAC-COR certification.

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain the duties and responsibilities of the Contracting Officer's Representative (COR)
• Discuss COR best practices
• Define key acquisition terminology
• Associate the importance of professional business skills with effectively monitoring the work under the contract
• Determine the elements of contract monitoring appropriate for a given contract
• Describe the process leading up to contract award
• Appropriately respond to legal and ethical issues that may arise

TARGET AUDIENCE
New/mid-career hires who anticipate being appointed as a COR. Agreement Officer's Technical Representatives, persons monitoring task orders under an Indefinite Delivery/Indefinite Quantity contract, and anyone desiring Basic COR Training.

TRAINING LEVEL: Basic

FEE: 2022: $650 Per Person; 2023: $700 Per Person

LENGTH: 40 HOURS (CEU: 3 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-310124A

COURSE TITLE
Highway Research 101: Administering the FHWA Highway Research Program

In advancing Federal highway research goals, collaboration between FHWA, grant recipients, and sub-recipients is critical. The Highway Research 101: Administering the FHWA Highway Research Program Web-based Training (WBT) is intended to highlight the responsibilities of FHWA Division Office staff members responsible for research oversight and to acquaint them with the key aspects of regulation and practice that satisfy the agency’s responsibility, as well as expose them to FHWA R&T priorities and programs to help them advance agency goals.

Implementation of RD&T programs is highly contextual, as is implementation of the overall federally assisted, State-administered programs. Those considered among the best are developed and executed to meet the unique priorities and needs of each FHWA partner. Thus, the emphasis of this course is not to communicate the one best way to administer programs using specific professional disciplines. Instead, it communicates the basics of sound project and program management, ranging from practices that lay a framework for optimizing return on investment and provide for accountability to stimulating innovation and improvements to the state of the practice. Formal case studies are available in this course to illustrate the concepts.

OUTCOMES
Upon completion of the course, participants will be able to:
- Define FHWA's Research Development and Technology (RD&T) policy
- Explain the Research Program Management Process
- Describe how to administer the requirements for SP&R Subpart B work programs
- Explain how to determine what costs are eligible
- Define a peer exchange program
- Identify the RD&T Coordinator's role in determining state highway problems and RD&T needs
- Identify how national programs and organizations impact/complement SP&R Part B

TARGET AUDIENCE
The target audience for this course is the staff person deployed in each FHWA Division Office to carry out research oversight. Responsibility for the research portion of SP&R is normally only one of several functional programs administered by this individual. This course is applicable to FHWA research coordinators and other FHWA staff who need training and knowledge to administer the research portion of the SP&R program and support the development and execution of State research programs.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 4 HOURS (CEU: .4 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-310125

Course Title
Risk-Based Stewardship and Oversight (Federal Version)

This Instructor-led Training (ILT) course will expand participants’ understanding of the risk-based processes, roles and responsibilities that Federal Highway Administration (FHWA) Division and Program Office personnel are using to help optimize the effective and efficient delivery of the Federal-aid Highway Program (FAHP), and to help ensure its compliance with Federal laws and regulations. This approach, as it is being implemented, is commonly known as the Risk-based Stewardship and Oversight (RBSO) approach and builds upon the risk management foundation in the agency’s strategic and performance planning processes. The RBSO model is designed to identify risk-based S&O actions and initiatives at both the national and Division levels for both programs and projects.

Outcomes
Upon completion of the course, participants will be able to:
• Describe the FHWA vision and rationale for using Risk-Based Stewardship and Oversight (RBSO), built on four core principles, to optimize the successful delivery of the Federal Highway Program and ensure compliance with Federal law and regulations
• Explain how RBSO integrates strategic and performance planning to allocate limited resources in order to achieve stewardship and oversight objectives
• Explain how FHWA/State DOT Stewardship and Oversight (S&O) Agreements are used to ensure respective S&O responsibilities and expectations are set
• Demonstrate how RBSO integrates the FHWA risk management process to identify program and project risks, and develop the appropriate S&O response strategies to effectively manage those risks
• Explain how program involvement optimizes successful program and project delivery and helps ensure compliance with Federal requirements
• Explain how project involvement optimizes successful program and project delivery and helps ensure compliance with Federal requirements
• Demonstrate the RBSO tools FHWA uses to provide a reasonable level of assurance of both project and program compliance, while also informing other S&O strategies and actions
• Demonstrate how Divisions use risk-based project level S&O activities to: (1) manage project level risks, and (2) provide value-added stewardship to help optimize successful project and program delivery
• Demonstrate how the various RBSO tools work together to optimize the successful delivery of the Federal Highway Program

Target Audience
Since every member of FHWA is either directly or indirectly engaged in carrying out the agency’s role of stewardship and oversight on a routine basis, the target audience for this course includes FHWA personnel at all levels and in all disciplines, in both Division and Program Offices. State DOT management officials, and other DOT staff involved in the delivery of the FAHP, would also benefit from taking this course.

Training Level: Basic
Fee: 2022: $700 Per Person; 2023: $700 Per Person
Length: 2 DAYS (CEU: 1.2 UNITS)
Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873  •  nhicustomerservice@dot.gov
Course Number
FHWA-NHI-310126

Course Title
Risk-Based Stewardship and Oversight (State Version)

The Federal Highway Administration (FHWA) is implementing a risk-based framework to optimize the effective and efficient delivery of the Federal-aid Highway Program and to help ensure its compliance with Federal laws and regulations. The framework is known as the Risk-based Stewardship and Oversight (RBSO) approach, and builds upon the risk management foundation in the agency’s strategic and performance planning processes. The RBSO model is designed to identify risk-based stewardship and oversight (S&O) actions and initiatives for both programs and projects. This Instructor-led Training (ILT) course will provide participants with a working knowledge of the RBSO approach and a basic understanding of its key components: the Stewardship and Oversight Agreement between an FHWA Division and the State DOT, the role of risk management in developing stewardship and oversight strategies, the data-driven Compliance Assessment Program (CAP), and risk-based stewardship and oversight involvement in Projects of Division Interest (PoDIs), including Major Projects. State DOTs will benefit from understanding how and why FHWA is implementing its new RBSO approach. State DOTs will learn the basis upon which they can assume greater responsibilities for various project types as envisioned by Congress in 23 USC 106(c) and their oversight responsibilities under Section 106(g). The training will provide the State DOTs and local public agencies (LPAs) with tools to help them manage risk and focus resources when assuming project actions traditionally handled by FHWA. The course presents opportunities where State DOTs can discuss how they can partner with their FHWA counterparts in various elements of the RBSO framework for successful implementation.

Outcomes
Upon completion of the course, participants will be able to:
• Describe the vision and foundation for Risk-Based Stewardship and Oversight (RBSO).
• Explain how FHWA and State DOT roles and responsibilities are documented within the Stewardship and Oversight Agreement.
• Relate how the RBSO framework integrates risk management practices in partnership with State DOTs.
• Describe how FHWA is increasingly using program involvement, rather than project involvement, to support States in optimizing the effective delivery of the FAHP.
• Identify those project actions and approvals that FHWA Divisions are still responsible for under 23 U.S.C. Section 106.
• Explain how FHWA identifies Projects of Division Interest (PoDIs) and develops supporting plans.
• Describe how FHWA will use project data gathering tools for assessing program compliance.

Target Audience
State DOT program managers, project managers, engineers, planners, and other transportation specialists involved in the delivery of projects under the Federal-aid Highway Program. In addition to State DOT staff, their counterparts at Local Public Agencies, as well as those at other State and regional agencies that deliver Federal-aid highway projects, would also benefit from taking this course.

Training Level: Basic

Fee: 2022: $350 Per Person; 2023: $350 Per Person

Length: 1 DAYS (CEU: .6 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-361031A

Course Title
DBE/ACDBE Certification Presentation

On November 3, 2014, the Department of Transportation issued a final rule amending its disadvantaged business enterprise program at 49 CFR Part 26. This final rule contains amendments to various certification provisions that are not reflected in the 9-module DBE/ACDBE Certification Training series (FHWA-NHI-361031). We are working to update the 9 modules to reflect the changes. In the meantime, we recommend that upon completion of training you watch a recorded presentation of the final rule amendments available at the Departmental Office of Civil Rights website here: http://www.civilrights.dot.gov/disadvantaged-business-enterprise

-- This presentation is provided to you at no cost by the Office of the Secretary of Transportation (OST) --

This informative presentation will help you become aware of the skills necessary to perform a full review and analysis of Disadvantaged Business Enterprise (DBE) and Airport Concession Disadvantaged Business Enterprise (ACDBE) certification eligibility. This material is delivered through approximately 12 hours of web-based presentations consisting of 9 critical module segments. This material helps expose persons responsible for determining whether or not a firm qualifies as a DBE or ACDBE, as well as those who have general DBE/ACDBE program responsibilities, are knowledgeable concerning all requirements for eligibility, and that the interpretation and application of requirements are consistent throughout the country.

This is presently an informative presentation as new updates are being developed and should available mid-2021.

Outcomes

Upon completion of the course, participants will be able to:

- Identify and understand the historical foundation of the DBE/ACDBE program, its objectives, and the overall program operation
- Identify basic certification eligibility requirements according to the regulation 49 CFR Part 26
- Assess whether applicant firms and existing DBE/ACDBEs meet the small business size requirements of the regulation
- Assess ownership/control requirements according to the regulation
- Determine how applicant owners can make an individual showing of social and economic disadvantage according to 49 CFR Part 26 and Appendix E
- Assess whether firm owners meet the economic disadvantage requirements of the regulation
- Perform on-site reviews and collect necessary data
- Properly deny applicant firms entry into the program or remove existing firms’ DBE/ACDBE certification
- Properly apply the interstate certification provisions of the regulation
- Understand fraud and fraud prevention strategies applicable to the DBE/ACDBE program
- Identify and understand DBE/ACDBE certification requirements

Target Audience

All persons responsible for determining whether a firm qualifies as a DBE or ACDBE should view this presentation, including certifiers and DBE Liaison Officers. Certifiers are required to be knowledgeable concerning all requirements for eligibility and that the interpretation and application of the regulatory requirements are applied consistently nationwide. Ensuring that individuals processing DBE certifications apply the same measure of scrutiny and subjectivity is integral to maintaining the integrity of the program.
TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 10 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-133078

Course Title
Access Management: Fundamental Principles and Application

This two-day course is designed to provide those who plan, operate, design, construct, or administer surface transportation or land use systems with a basic understanding of access management concepts and tools (e.g., permits, governance, practicality) available to them, the benefits of successful access management, and the costs, consequences, and even potential liabilities of unsuccessful access management.

Outcomes
Upon completion of the course, participants will be able to:

• Define key concepts of access management and understand the symbiotic relationship of driveways, local streets, collectors, arterials and highways.

• List the benefits of good access management. Understand the consequences of poor access management.

• State the impacts of either favoring access or through traffic on the safety, operations, and sustainability of surface transportation systems for all users.

• Explain the importance of access management to complete streets and transportation (all modes) systems.

• Describe access-related challenges as they pertain to public rights-of-way and private property.

• Choose access management techniques or combinations of techniques that meet intended precepts to move traffic, or provide access, with attention to enhancing safety and operations for all users.

• Identify and address legal, political, and jurisdictional challenges to implementation of access management.

Target Audience
This course is intended for both technical and non-technical professionals working in, or having a strong interest in, transportation or land use planning, operations, design, maintenance, and development review in the public and private sectors.

Training Level: Basic

Fee: 2022: $700 Per Person; 2023: $900 Per Person

Length: 2 DAYS (CEU: 1.2 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-133078A

Course Title
Access Management: Fundamental Principles, Application and Computation

This course is designed to provide those who plan, operate, design, construct, or administer surface transportation or land use systems with a basic understanding of the concepts and tools available to them, the benefits of successful access management, and the costs of unsuccessful access management.

This three-day course provides more in-depth content targeted for technical professionals. This course is intended to attract participants beyond traditional state and local agency technical staff, including: planners, engineers, permit specialists, legal counsel, and project managers associated with transportation planning, operations, design, maintenance, and development review. The third day of this three-day class is designed to provide additional and more advanced instruction to participants than the FHWA-NHI133078 (two-day) course and is for those who desire to deepen their understanding of access management through more computationally-driven applications of the course materials.

Outcomes
Upon completion of the course, participants will be able to:

• Determine the impacts of signalized and unsignalized access connections on a given corridor in terms of safety, capacity, and business market area
• Describe optimum connectivity for a given land use
• Calculate needed turn lane lengths, given a set of data
• Describe the interactions of access management treatments with both motorized and non-motorized users
• Select appropriate median access management techniques for a given application
• Select appropriate margin access management techniques for a given application

Target Audience
Technical professionals who are responsible for the engineering and planning applications necessary to support the development and administration of policies, planning, and design of transportation facilities and programs regarding access management.

Training Level: Intermediate

Fee: 2022: $800 Per Person; 2023: $1025 Per Person

Length: 3 DAYS (CEU: 1.8 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-133078V

COURSE TITLE
Access Management: Fundamental Principles, Application and Computation (Virtual Delivery)

This course is designed to provide those who plan, operate, design, construct, or administer surface transportation or land use systems with a basic understanding of the concepts and tools available to them, the benefits of successful access management, and the costs of unsuccessful access management.

This four-day course provides more in-depth content targeted for technical professionals. This course is intended to attract participants beyond traditional state and local agency technical staff, including: planners, engineers, permit specialists, legal counsel, and project managers associated with transportation planning, operations, design, maintenance, and development review. The third day of this three-day class is designed to provide additional and more advanced instruction to participants than the FHWA-NHI133078 (two-day) course and is for those who desire to deepen their understanding of access management through more computationally-driven applications of the course materials.

OUTCOMES
Upon completion of the course, participants will be able to:

• Determine the impacts of signalized and unsignalized access connections on a given corridor in terms of safety, capacity, and business market area
• Describe optimum connectivity for a given land use
• Calculate needed turn lane lengths, given a set of data
• Describe the interactions of access management treatments with both motorized and non-motorized users
• Select appropriate median access management techniques for a given application
• Select appropriate margin access management techniques for a given application

TARGET AUDIENCE
Technical professionals who are responsible for the engineering and planning applications necessary to support the development and administration of policies, planning, and design of transportation facilities and programs regarding access management.

TRAINING LEVEL: Basic

FEE: 2022: $700 Per Person; 2023: $700 Per Person

LENGTH: 18 HOURS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 25

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-133116

Course Title
Maintenance of Traffic for Technicians - WEB BASED

The Maintenance of Traffic for Technicians Web-based training presents information about the placement of, field maintenance required for, and inspection of traffic control devices. In addition, drafting work zone traffic control plans and flagging are discussed.

We've broken this training into five modules:
1. General Terms and Procedures
2. Traffic Channelizing and Control Devices
3. Traffic Control Zones
4. Flagger Operations
5. Traffic Control Zone Operations

Outcomes
Upon completion of the course, participants will be able to:

• Identify the correct placement of work zone traffic control devices
• Perform field maintenance of work zone traffic control devices
• Inspect placement or operational functions of work zone traffic control devices
• Generate work zone traffic control plans
• Explain the basics of flagging

Target Audience
This training is designed for all persons with duties that include: Direct responsibility for placement of work zone traffic control devices; Direct responsibility for field maintenance of work zone traffic control devices; Inspection of the placement or operational function of work zone traffic control devices; and Drafting or electronic generation of work zone traffic control plans. The target audience could be geographically dispersed, in need of immediate training or information, or not have access to travel funds.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 5 Hours (CEU: 0 Units)

Class Size: Minimum: 1; Maximum: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-133117

COURSE TITLE
Maintenance of Traffic for Supervisors - WEB BASED

The Maintenance of Traffic for Supervisors Web-based training presents information about the placement of, field maintenance required for, and inspection of traffic control devices. In addition, drafting work zone traffic control plans and flagging are discussed. This training focuses on the design of a traffic control plan, and how and why one needs to operate and implement traffic control in the work zone.

We've broken this training into five modules:
1. Fundamental Principles of Temporary Traffic Control Zones
2. Temporary Traffic Control Devices
3. Traffic Control Zones
4. Transportation Management Plans
5. Flagger Operations

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe how to create clear, organized traffic control plans
• Identify acceptable temporary traffic control devices
• Determine good and bad flagging techniques

TARGET AUDIENCE
This training is designed for personnel with responsibility or authority to decide on the specific maintenance of traffic requirements to be implemented. These positions include engineers responsible for work zone traffic control development and work site traffic supervisors. The target audience could be geographically dispersed, in need of immediate training or information, or not have access to travel funds.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 5 HOURS (CEU: .5 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-137070

COURSE TITLE
Improving Highway Safety with ITS

This is the PILOT session for the updated NHI-137070 course. If you are not registered for the pilot session, please return to the website in February 2023 for the launch of the new version of this course.

‘Improving Highway Safety with ITS’ is an 1.5 hours WBT course offered by NHI, the authoritative source in transportation training. This course is an introduction to ITS-based strategies and tools available for improving highway safety. This course is intended for ITS, transportation operations, and safety professionals, including, but not limited to, planners, operators, designers, emergency management, and maintenance personnel. This course is divided into five lessons, each intended to introduce or illustrate concepts relating to the development and deployment of ITS strategies to address safety issues.

To enroll in this web-based training course, select ‘Add to Cart.’

OUTCOMES
Upon completion of the course, participants will be able to:

• Explain the overall magnitude and importance of highway safety
• Recognize and discuss the contribution ITS can make in improving highway safety
• Identify applications in the connected vehicle program that are primarily safety related
• Describe the framework for considering ITS countermeasures within your safety planning process
• Exploit practical opportunities for collaboration among Safety and ITS personnel
• Employ several ITS and Safety resources

TARGET AUDIENCE
The target audience for this WBT course are safety professionals, including planners, operators, designers, emergency management, and maintenance personnel.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1.5 HOURS (CEU: .1 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-142045

COURSE TITLE
Pedestrian Facility Design

To emphasize the importance of planning for pedestrians, the course focuses on case examples involving corridor and intersection design issues. Participants are engaged through lecture, discussion, video demonstrations of problem areas in corridors and intersections, small group problem identification, and the development of design alternatives. This training was developed to provide information and application opportunities to those involved in the design of pedestrian facilities. The Americans with Disabilities Act (ADA) requires newly constructed and altered sidewalks to be accessible and usable by people with disabilities, and accessibility improvements need to be implemented for existing facilities.

OUTCOMES
Upon completion of the course, participants will be able to:
• List the characteristics of pedestrians and motorized traffic that influence pedestrian facility design
• Apply the concepts of universal design and applicable design reference material to redesigning an existing location and/or designing a new location that meets the needs of motorized and nonmotorized users
• Given a case example, identify potential conflicts between pedestrians and other traffic and propose design options that improve access and safety
• Given a case example, analyze the network for improvement options to meet the needs of pedestrian and other traffic

TARGET AUDIENCE
Engineers with planning, design, construction, or maintenance responsibilities; pedestrian and bicycle specialists, disability and orientation specialists, transportation planners, architects, landscape architects, as well as decisionmakers at the project planning level.

TRAINING LEVEL: Intermediate

FEE: 2022: $350 Per Person; 2023: $500 Per Person
LENGTH: 1.5 DAYS (CEU: .9 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-380005

COURSE TITLE
Railroad-Highway Grade Crossing Improvement Program
The training provides information on rail-highway crossings, grade crossing components, including program/project development and administration. Workshops will provide the participants a chance to make hands-on applications of the training material, which include such topics as historical background, railroad-highway intersection definition and components, collection and maintenance of data, assessment of crossing safety and operations, identification and selection of alternate improvements, program and project development and implementation, maintenance, and other topics (i.e., private crossings, operation lifesaver).

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe Active and Passive Devices used in connection with at-grade crossings
• Identify techniques and engineering principles used for at-grade crossings
• Appraise existing at-grade crossings
• Develop alternate methods to improve railroad-highway grade crossings

TARGET AUDIENCE
Federal, State, and local transportation agencies responsible for the design, construction, and/or maintenance of railroad-highway crossings. State and local traffic engineers responsible for highway-railroad grade crossing safety.

TRAINING LEVEL: Accomplished
FEES: 2022: $500 Per Person; 2023: $550 Per Person
LENGTH: 2 DAYS (CEU: 1.2 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-380032A

COURSE TITLE
Roadside Safety Design (3-Day)

This course provides an overview of the AASHTO Roadside Design Guide. At the end of the course, you will be able to apply the clear zone concept to all classes of roadways; recognize unsafe roadside design features and elements and make appropriate changes; identify the need for a traffic barrier; and apply other highway hardware core competencies.

This course is intended for experienced safety and design engineers.

OUTCOMES
Upon completion of the course, participants will be able to:
• Apply the clear zone concept to all classes of roadway
• Warrant roadside and median barriers
• Design roadside barriers
• Select the most appropriate end treatment
• Select the most appropriate safety hardware
• Correctly locate safety hardware
• Describe the elements of economic analysis

TARGET AUDIENCE
Experienced Federal, State, and local highway engineers involved in the formulation and/or application of policies and standards relating to the design of safe roadside hardware.

TRAINING LEVEL: Accomplished

FEE: 2022: $550 Per Person; 2023: $600 Per Person

LENGTH: 3 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-380070

Course Title

This course includes both 2-lane and multi-lane highways and provides a proven methodology for the safety performance of geometric design decisions in a like manner to that of predicting capacity and level of service based upon large scale definitive research. The crash prediction models for total crashes and cross-section related crashes based upon lane width, shoulder width, roadside hazard, traffic volume (exposure) and other characteristics are presented. Examples of safety performance prediction are presented for highway segments and intersections.

Discussion of research and the interactive effects of lane and shoulder widths, hazard rating, and access density (driveways) on safety performance are presented. Each student receives a copy of the “Safety Effects of Highway Design Features” manual.

IMPORTANT: Participants should bring a scientific notation calculator as the course involves calculating decimal value to decimal power for crash prediction values.

Outcomes
Upon completion of the course, participants will be able to:
• Recognize the safety effects of geometric design features
• Predict the safety performance of geometric design features
• Compare alternative designs based upon an assessment of the safety effects of geometric design features

Target Audience
State and local highway engineers and consultants involved in the design of both two-lane rural and/or multilane highways.

Training Level: Accomplished

Fee: 2022: $500 Per Person; 2023: $550 Per Person

Length: 2 DAYS (CEU: 1.2 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-380070A

COURSE TITLE
Highway Safety Manual Practitioners Guide for Two-Lane Rural Highways

This course provides a proven methodology for the safety performance of geometric design decisions in a like manner to that of predicting capacity and level of service based upon large scale definitive research. The crash prediction models for total crashes and cross-section related crashes based upon lane width, shoulder width, roadside hazard, traffic volume (exposure) and other characteristics are presented. Examples of safety performance prediction are presented for highway segments and intersections.

Discussion of research and the interactive effects of lane and shoulder widths, hazard rating, and access density (driveways) on safety performance are presented. Each student receives a copy of the “Safety Effects of Highway Design Features for Two-Lane Rural Highways” manual.

IMPORTANT: Participants should bring a scientific notation calculator as the course involves calculating decimal value to decimal power for crash prediction values.

OUTCOMES
Upon completion of the course, participants will be able to:
• Recognize the safety effects of geometric design features
• Predict the safety performance of geometric design features
• Compare alternative designs based upon an assessment of the safety effects of geometric design features

TARGET AUDIENCE
State and local highway engineers and consultants involved in the design of two-lane rural highways.

TRAINING LEVEL: Accomplished

FEE: 2022: $400 Per Person; 2023: $500 Per Person

LENGTH: 1 DAYS (CEU: .6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-380070B

COURSE TITLE

This course provides proven methodology for the safety performance of geometric design decisions for multilane highways in a like manner to that of predicting capacity and level of service based upon large scale definitive research. The crash prediction models for total crashes based upon lane width, shoulder width, roadside hazard, traffic volume (exposure) and other characteristics are presented. Examples of safety performance prediction are presented for highway segments and intersections.

Discussion of research and the interactive effects on safety performance for median width and barriers, of access (driveways) and side streets and intersection turning lanes are presented. Each student receives a copy of the “Safety Effects of Highway Design Features” manual.

IMPORTANT: Participants should bring a scientific notation calculator as the course involves calculating decimal value to decimal power for crash prediction values.

OUTCOMES
Upon completion of the course, participants will be able to:

• Recognize the safety effects of geometric design features
• Predict the safety performance of geometric design features
• Compare alternative designs based upon an assessment of the safety effects of geometric design features

TARGET AUDIENCE
State and local highway engineers and consultants involved in the design of multilane highways.

TRAINING LEVEL: Accomplished

FEE: 2022: $500 Per Person; 2023: $550 Per Person

LENGTH: 1 DAYS (CEU: .6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
FHWA-NHI-380078

Signalized Intersection Guidebook Workshop

This course provides a holistic approach to signalized intersections and considers the safety and operational implications of a particular treatment on all system users, including motorists, pedestrians, bicyclists, and transit users. Using the guide, participants learn to make insightful intersection assessments, understand the tradeoffs of potential improvement measures, and apply guidebook measures and best practices to reduce the incidence of intersection crashes.

Practitioners will find the tools and information necessary to make insightful intersection assessments and to understand the impacts of potential improvement measures. The information in this guide is based on the latest research available and includes examples of novel treatments as well as best practices in use by jurisdictions across the United States and other countries. Additional resources and references are mentioned for the practitioner who wishes to learn more about a particular subject.

This guide upon which this workshop is based is not intended to replicate or replace traditional traffic engineering documents such as the Manual on Uniform Traffic Control Devices (MUTCD), the Highway Capacity Manual (HCM) 2010 or the American Association of State Highway and Transportation Officials’ (AASHTO) A Policy on Geometric Design of Highways and Streets, nor is it intended to serve as a standard or policy document. Rather, it provides a synthesis of the best practices and treatments intended to help practitioners make informed, thoughtful decisions.

OUTCOMES

Upon completion of the course, participants will be able to:

• Describe the process for selecting traffic signal locations
• Explain various traffic signal parameters, left turn phasing options, and detection
• Explain the relationship between safety and operations
• Identify and describe performance and safety impacts of traffic signal treatments

TARGET AUDIENCE

Professionals responsible for design, management, or operation of traffic signals. This includes design engineers, operations engineers and technicians (advanced) of state/local agencies, consultants, and FHWA Operations staff.

TRAINING LEVEL: Intermediate

FEE: 2022: $300 Per Person; 2023: $350 Per Person

LENGTH: 1 DAYS (CEU: .6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-380078V

Course Title
Signalized Intersection Guidebook Workshop (VIRTUAL DELIVERY)

This course provides a holistic approach to signalized intersections and considers the safety and operational implications of a particular treatment on all system users, including motorists, pedestrians, bicyclists, and transit users. Using the guide, participants learn to make insightful intersection assessments, understand the tradeoffs of potential improvement measures, and apply guidebook measures and best practices to reduce the incidence of intersection crashes.

Practitioners will find the tools and information necessary to make insightful intersection assessments and to understand the impacts of potential improvement measures. The information in this guide is based on the latest research available and includes examples of novel treatments as well as best practices in use by jurisdictions across the United States and other countries. Additional resources and references are mentioned for the practitioner who wishes to learn more about a particular subject.

This guide upon which this workshop is based is not intended to replicate or replace traditional traffic engineering documents such as the Manual on Uniform Traffic Control Devices (MUTCD), the Highway Capacity Manual (HCM) 2010 or the American Association of State Highway and Transportation Officials’ (AASHTO) A Policy on Geometric Design of Highways and Streets, nor is it intended to serve as a standard or policy document. Rather, it provides a synthesis of the best practices and treatments intended to help practitioners make informed, thoughtful decisions.

Outcomes
Upon completion of the course, participants will be able to:
- Describe the process for selecting traffic signal locations
- Explain various traffic signal parameters, left turn phasing options, and detection
- Explain the relationship between safety and operations
- Identify and describe performance and safety impacts of traffic signal treatments

Target Audience
Professionals responsible for design, management, or operation of traffic signals. This includes design engineers, operations engineers and technicians (advanced) of state/local agencies, consultants, and FHWA Operations staff.

Training Level: Intermediate

Fee: 2022: $300 Per Person; 2023: $350 Per Person

Length: 6 HOURS (CEU: .6 UNITS)

Class Size: Minimum: 15; Maximum: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-380089

COURSE TITLE
Designing for Pedestrian Safety

The Designing for Pedestrian Safety course is intended to help state and local transportation engineering professionals address pedestrian safety issues through design and engineering solutions. The training course includes a field exercise in the application of the principles, concepts, and strategies covered in the course. Also the participants will share and prioritize potential policies, programs, and strategies.

OUTCOMES
Upon completion of the course, participants will be able to:

- Describe the influence of planning factors: land use, street connectivity, access management, site design, and level of service.
- Describe how pedestrians should be considered and provided for during the planning, design, work zone, maintenance, and operations phases.
- Describe how human behavior affects the interaction between pedestrians and drivers
- Identify good practices and effective solutions to enhance pedestrian safety and accessibility.

TARGET AUDIENCE
This course is intended primarily for state DOT staff involved with the Highway Safety Improvement Program, and for FHWA Safety Specialists. These specialists shall include: Engineers, planners, traffic safety and enforcement professionals, public health and injury prevention professionals, and decision-makers who have the responsibility of improving pedestrian safety at the state or local level.

TRAINING LEVEL: Basic

FEE: 2022: $400 Per Person; 2023: $400 Per Person

LENGTH: 2 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-380089V

COURSE TITLE
Designing for Pedestrian Safety (VIRTUAL DELIVERY)

The Designing for Pedestrian Safety course is intended to help state and local transportation engineering professionals address pedestrian safety issues through design and engineering solutions. The training course includes a field exercise in the application of the principles, concepts, and strategies covered in the course. Also the participants will share and prioritize potential policies, programs, and strategies.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the influence of planning factors: land use, street connectivity, access management, site design, and level of service.
• Describe how pedestrians should be considered and provided for during the planning, design, work zone, maintenance, and operations phases.
• Describe how human behavior affects the interaction between pedestrians and drivers.
• Identify good practices and effective solutions to enhance pedestrian safety and accessibility.

TARGET AUDIENCE
This course is intended primarily for state DOT staff involved with the Highway Safety Improvement Program, and for FHWA Safety Specialists. These specialists shall include: Engineers, planners, traffic safety and enforcement professionals, public health and injury prevention professionals, and decision-makers who have the responsibility of improving pedestrian safety at the state or local level.

TRAINING LEVEL: Basic

FEE: 2022: $400 Per Person; 2023: $400 Per Person
LENGTH: 12 HOURS (CEU: 1.2 UNITS)
CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-380090

Course Title
Developing a Pedestrian Safety Action Plan

The Developing a Pedestrian Safety Action Plan course is designed to help state and local officials learn “HOW TO” address pedestrian safety issues in the development of a pedestrian safety action plan, program, and activities tailored to their community. It is also intended to assist agencies in the further enhancement of their existing pedestrian safety plan, programs, and activities, including involving partners and stakeholders, collecting and analyzing data and information, prioritizing issues and concerns, selecting and implementing an optimal combination of education, enforcement, engineering strategies. The training course includes a field exercise in the application of the principles, concepts, and strategies covered in the course. Also the participants will share and prioritize potential policies, programs, and strategies.

Outcomes
Upon completion of the course, participants will be able to:

• Develop and implement a Pedestrian Safety Action Plan addressing your specific issues, problems, needs and resources
• Describe how pedestrians should be considered and provided for during the planning, design, work zone, maintenance, and operations phases.
• Describe how human behavior affects the interaction between pedestrians and drivers
• Identify good practices and effective solutions to enhance pedestrian safety and accessibility.

Target Audience
This course is intended primarily for state DOT staff involved with the Highway Safety Improvement Program, and for FHWA Safety Specialists. These specialists shall include: Engineers, planners, traffic safety and enforcement professionals, public health and injury prevention professionals, and decision-makers who have the responsibility of improving pedestrian safety at the state or local level.

Training Level: Basic

Fee: 2022: $400 Per Person; 2023: $500 Per Person

Length: 2 DAYS (CEU: 1.2 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-380090V

COURSE TITLE
Developing a Pedestrian Safety Action Plan (VIRTUAL DELIVERY)

The Developing a Pedestrian Safety Action Plan course is designed to help state and local officials learn “HOW TO” address pedestrian safety issues in the development of a pedestrian safety action plan, program, and activities tailored to their community. It is also intended to assist agencies in the further enhancement of their existing pedestrian safety plan, programs, and activities, including involving partners and stakeholders, collecting and analyzing data and information, prioritizing issues and concerns, selecting and implementing an optimal combination of education, enforcement, engineering strategies. The training course includes a field exercise in the application of the principles, concepts, and strategies covered in the course. Also the participants will share and prioritize potential policies, programs, and strategies.

OUTCOMES
Upon completion of the course, participants will be able to:

• Develop and implement a Pedestrian Safety Action Plan addressing your specific issues, problems, needs and resources
• Describe how pedestrians should be considered and provided for during the planning, design, work zone, maintenance, and operations phases.
• Describe how human behavior affects the interaction between pedestrians and drivers
• Identify good practices and effective solutions to enhance pedestrian safety and accessibility.

TARGET AUDIENCE
This course is intended primarily for state DOT staff involved with the Highway Safety Improvement Program, and for FHWA Safety Specialists. These specialists shall include: Engineers, planners, traffic safety and enforcement professionals, public health and injury prevention professionals, and decision-makers who have the responsibility of improving pedestrian safety at the state or local level.

TRAINING LEVEL: Basic

FEE: 2022: $400 Per Person; 2023: N/A

LENGTH: 12 HOURS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-380091

COURSE TITLE
Planning and Designing for Pedestrian Safety

The Planning and Designing for Pedestrian Safety is a combination of the information from the 2-day “Developing a Pedestrian Safety Action Plan” (NHI-380089) and 2-day “Designing for Pedestrian Safety” (NHI-380090) course. This comprehensive course is designed to help state and local officials learn “HOW TO” address pedestrian safety issues in the development of a pedestrian safety action plan, and specific programs and activities tailored to their community. It is also intended to assist agencies in the further enhancement of their existing pedestrian safety plan, programs, and activities, including involving partners and stakeholders, collecting and analyzing data and information, prioritizing issues and concerns, selecting and implementing an optimal combination of education, enforcement, engineering strategies. This course goes into more detail on engineering strategies than the “Developing a Pedestrian Safety Action Plan” (NHI-380089) course. This course includes two field exercises in the application of the principles, concepts, and strategies covered in the course. Also the participants will share and prioritize potential policies, programs, and strategies.

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe the role that planning and street design play in pedestrian safety.
• Demonstrate how pedestrians should be considered and provided for during the planning, design, work zone maintenance, and operations phases of the pedestrian safety action plan.
• Describe how human behavior issues related to pedestrians and drivers interacting safely and common pedestrian crash types.
• Identify good practices and effective solutions to enhance pedestrian safety and accessibility.
• Explain the significance of land-use, street connectivity, and site design in helping to make a safer pedestrian environment.
• Recognize human behavior issues related to pedestrians and drivers interacting safely and common pedestrian crash types.
• Collect and analyze data in a meaningful way to identify safety deficiencies and priorities for improvement.
• Employ commonly used and effective pedestrian crash countermeasures
• Effectively involve stakeholders to create publicly supported and trusted policies, programs, and projects.

TARGET AUDIENCE
Engineers, planners, traffic safety and enforcement professionals, public health and injury prevention professionals, and decision-makers who have the responsibility of improving pedestrian safety at the state or local level.

TRAINING LEVEL: Basic

FEES: 2022: $600 Per Person; 2023: $600 Per Person

LENGTH: 3 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-380091V

COURSE TITLE
Planning and Designing for Pedestrian Safety (VIRTUAL DELIVERY)

The Planning and Designing for Pedestrian Safety is a combination of the information from the 2-day “Developing a Pedestrian Safety Action Plan” (NHI-380089) and 2-day “Designing for Pedestrian Safety” (NHI-380090) course. This comprehensive course is designed to help state and local officials learn “HOW TO” address pedestrian safety issues in the development of a pedestrian safety action plan, and specific programs and activities tailored to their community. It is also intended to assist agencies in the further enhancement of their existing pedestrian safety plan, programs, and activities, including involving partners and stakeholders, collecting and analyzing data and information, prioritizing issues and concerns, selecting and implementing an optimal combination of education, enforcement, engineering strategies. This course goes into more detail on engineering strategies than the “Developing a Pedestrian Safety Action Plan” (NHI-380089) course. This course includes two field exercises in the application of the principles, concepts, and strategies covered in the course. Also the participants will share and prioritize potential policies, programs, and strategies.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the role that planning and street design play in pedestrian safety.
• Demonstrate how pedestrians should be considered and provided for during the planning, design, work zone maintenance, and operations phases of the pedestrian safety action plan.
• Describe how human behavior issues related to pedestrians and drivers interacting safely and common pedestrian crash types.
• Identify good practices and effective solutions to enhance pedestrian safety and accessibility.
• Explain the significance of land-use, street connectivity, and site design in helping to make a safer pedestrian environment.
• Recognize human behavior issues related to pedestrians and drivers interacting safely and common pedestrian crash types.
• Collect and analyze data in a meaningful way to identify safety deficiencies and priorities for improvement.
• Effectively involve stakeholders to create publicly supported and trusted policies, programs, and projects.

TARGET AUDIENCE
Engineers, planners, traffic safety and enforcement professionals, public health and injury prevention professionals, and decision-makers who have the responsibility of improving pedestrian safety at the state or local level.

TRAINING LEVEL: Basic

FEE: 2022: $600 Per Person; 2023: $600 Per Person

LENGTH: 18 HOURS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Geometric Design: Applying Flexibility and Risk Management

Highway designers often face complex trade-offs when developing projects. A “quality” design may be thought of as satisfying the needs of a wide variety of users while balancing the often competing interests of cost, safety, mobility, social and environmental impacts. Applying flexibility and risk management in highway design requires more than simply assembling geometric elements from the available tables, charts and equations of design criteria. This transportation training provides participants with knowledge of the functional basis of critical design criteria to enable informed decisions when applying engineering judgment and flexibility. The training exercises and case studies provide practical applications of current knowledge from research and experience of safety and operational effects for various design elements.

OUTCOMES

Upon completion of the course, participants will be able to:

• Explain the relationships and inherent flexibility among design criteria, guidelines, standards, and policies.
• Explain key concepts and assumptions of design “rules” as a basis for judging risks and making tradeoffs.
• Apply FHWA’s Controlling Criteria and justify Design Exceptions.
• Identify available tools and techniques to quantify safety and operational effects and manage risks.
• Recognize opportunities to use performance analysis in decision-making
• Demonstrate confidence to make design choices that are flexible, for which risks are understood, leading to better outcomes in implementing projects.

TARGET AUDIENCE

This training targets transportation engineers responsible for selection of roadway design criteria in the development of street and highway projects. This training will be most advantageous for practicing engineers from state highway agencies, local agencies, engineering design consultants and FHWA field offices. We encourage participation from diverse agencies in this transportation training. A mixture of professional backgrounds will facilitate conversations regarding opportunities to apply design flexibilities on actual projects involving multiple stakeholders at the state and local levels.

TRAINING LEVEL: Accomplished

FEE: 2022: $550 Per Person; 2023: $550 Per Person
LENGTH: 2 DAYS (CEU: 1.2 UNITS)
CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-380096

Course Title
Modern Roundabouts: Intersections Designed for Safety

The modern roundabout is a proven strategy for improving the safety and operations of intersections. The physical characteristics of a well-designed modern roundabout reduce the frequency and severity of intersection crashes for all users including pedestrians and bicyclists. This course highlights the benefits of modern roundabouts and gives participants the fundamental knowledge needed to plan and consider applying roundabout intersection projects in their area. This course is an introductory level course with a blend of technical and non-technical planning, design and operations considerations.

Outcomes
Upon completion of the course, participants will be able to:

• Distinguish a modern roundabout from other types of circular intersections
• Describe the safety advantages of roundabouts
• Describe the operational advantages roundabouts provide
• Identify what type of locations roundabouts may be appropriate
• Describe strategies to overcome common barriers to implementation of roundabouts, such as negative public perceptions
• Describe the key considerations when planning an area’s first roundabout
• Apply basic traffic operational models and capacity calculations for roundabouts
• Describe key geometric design principles of a modern roundabout
• Apply signing and marking suggested practices
• Apply design strategies for pedestrians and bicyclists

Target Audience
Transportation professionals with at least one year of working experience

Training Level: Basic

Fee: 2022: $400 Per Person; 2023: $450 Per Person

Length: 1 DAYS (CEU: .6 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-380096V

COURSE TITLE
Modern Roundabouts: Intersections Designed for Safety (VIRTUAL DELIVERY)
The modern roundabout is a proven strategy for improving the safety and operations of intersections. The physical characteristics of a well-designed modern roundabout reduce the frequency and severity of intersection crashes for all users including pedestrians and bicyclists. This course highlights the benefits of modern roundabouts and gives participants the fundamental knowledge needed to plan and consider applying roundabout intersection projects in their area. This course is an introductory level course with a blend of technical and non-technical planning, design and operations considerations.

OUTCOMES
Upon completion of the course, participants will be able to:
• Distinguish a modern roundabout from other types of circular intersections
• Describe the safety advantages of roundabouts
• Describe the operational advantages roundabouts provide
• Identify what type of locations roundabouts may be appropriate
• Describe strategies to overcome common barriers to implementation of roundabouts, such as negative public perceptions
• Describe the key considerations when planning an area’s first roundabout
• Apply basic traffic operational models and capacity calculations for roundabouts
• Describe key geometric design principles of a modern roundabout
• Apply signing and marking suggested practices
• Apply design strategies for pedestrians and bicyclists

TARGET AUDIENCE
Transportation professionals with at least one year of working experience

TRAINING LEVEL: Basic

FEE: 2022: $400 Per Person; 2023: $400 Per Person

LENGTH: 6 HOURS (CEU: .6 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-380100

COURSE TITLE
Using Interactive Highway Safety Design Model (IHSDM)

How do you perform design policy checks, evaluate the safety performance, and assess the economic impacts of existing or proposed roads and design alternatives? IHSDM automates these tasks and more to help you make data-driven decisions throughout all stages of the project development process.

Learn how to use the latest IHSDM software tools to evaluate highway designs, compare alternatives, and inform investment decisions. You’ll start with web-based, guided training to learn the basics of IHSDM at your own pace. Then, you’ll shift to live, virtual instructor-led training to apply IHSDM modules and synthesize IHSDM output to make real-world decisions. The training will empower you to make quantitative, data-driven highway design decisions to improve safety and operations.

IHSDM is a suite of software analysis tools for evaluating the safety and operational effects of geometric design decisions. Through this blended, interactive, web-based IHSDM training course, participants will have the opportunity to use the actual IHSDM software tools to evaluate and analyze real highway designs. The new format consists of a blend of web-based (self-paced) training, virtual instructor-led training, and independent work. Upon completion of the course, participants will be able to quantify and compare the safety and operational performance of their design decisions beyond a simple check against design standards.

OUTCOMES
Upon completion of the course, participants will be able to:

- Explain the purpose of each of the IHSDM modules and related tools.
- Identify the installation process, required inputs, upload sequence, and data entry methods for the Crash Prediction Module (CPM) and Economic Analysis (EA) Tool.
- Calibrate CPM output to reflect local conditions.
- Apply the Crash Prediction Module (CPM) output to evaluate the safety of non-freeway segment, intersection, freeway, and interchange designs.
- Apply the IHSDM CPM output in the Economic Analysis (EA) Tool to perform benefit-cost analysis.
- Describe the key capabilities and appropriate uses of the other IHSDM tools.
- Use IHSDM output to make real-world decisions.

TARGET AUDIENCE
This course is designed for new and experienced personnel working on highway design projects who will be directly interacting with IHSDM software tools or applying the results. The IHSDM course benefits highway design project managers, planners, designers, safety engineers, and other personnel responsible for reviewing highway operations and safety. This course will also benefit university professors and students who use IHSDM for their courses and projects. Learners will generate quantitative information from IHSDM to help make, justify, and defend geometric design decisions throughout the highway design process.

TRAINING LEVEL: Intermediate

FEE: 2022: $75 Per Person; 2023: N/A

LENGTH: 14 HOURS (CEU: 1.4 UNITS)

CLASS SIZE: MINIMUM: 10; MAXIMUM: 40

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-380105

Course Title

The new Highway Safety Manual is the state of the art “toolbox” for the “science of safety” for the analysis and prediction of crash frequency for highways and streets. The HSM reflects the evolution in safety analysis from descriptive methods to quantitative, predictive analyses.

The Highway Safety Manual (HSM) provides analytical tools and techniques for quantifying the potential effects on crashes as a result of decisions made in planning, design, operations, and maintenance. A universal objective is to reduce the number and severity of crashes within the limits of available resources, science, and technology, while meeting legislatively mandated priorities. The information in the HSM is provided to assist agencies in their effort to integrate safety into their decision-making processes. The HSM is intended to be a resource document that is used nationwide to help transportation professionals conduct safety analyses in a technically sound and consistent manner thereby improving decisions made based on safety performance.

This course introduces practitioners at the state, county, metropolitan planning organization (MPO), or local level to the new techniques and knowledge in the HSM. The users and professionals described above include, but are not limited to transportation planners, highway designers, traffic engineers, and other transportation professionals who make discretionary road planning, design and operational decisions.

Outcomes
Upon completion of the course, participants will be able to:

- Recognize the Highway Safety Manual purpose, structure, and benefits
- Describe and apply Safety Performance Functions and Crash Modification Factors to analyze and predict crash frequency performance of highways, streets, and intersections

Target Audience
The course is intended practitioners at the state, county, metropolitan planning organization (MPO), or local level.

Training Level: Basic

Fee: 2022: $500 Per Person; 2023: $550 Per Person

Length: 1 DAYS (CEU: 0 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-380106

COURSE TITLE
Highway Safety Manual Online Overview

Implementation of the HSM requires an understanding of the Science of Safety which supports the quantitative methodologies presented in the manual. This course is an overview of the HSM structure, concepts and principles.

The free selection format of the course allows the student to select modules and concepts of interest in the order preferable to their:
- learning style
- time availability
- and previous knowledge level.

It includes an introduction of terminology, examples of the Roadway Safety Management Process (Part B) and Predictive Methods (Part C), explains the relationship of Crash Modification Factors (CMFs) to decision making and quantitative safety analysis, and human factors. FHWA will continue to develop courses, products and services to meet the needs of the HSM implementation community.

OUTCOMES
Upon completion of the course, participants will be able to:
- Identify the parts of HSM and what they are used for.
- Explain the overall concepts and principles promoted in HS for safety decision making.
- Recognize the benefits of using a quantitative safety analysis in various stages of the transportation project development process.

TARGET AUDIENCE
This course is for all interested students. It is an introductory course intended to provide a broad, base level understanding of HSM.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 12 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Maintenance of Drainage Features for Safety - WEB-BASED

The purpose of this training is to highlight common roadway drainage problems that can cause an unsafe condition and suggest inspection methods and corrective action. Maintaining roadway drainage is important for safety and for ensuring the long life of the roadway by preventing erosion of the roadway, saturation of the subbase, and damage to roadway structures. The training is broken into two modules:

Module 1: Effects of Drainage describes common roadway safety hazards and how to recognize drainage problems.

Module 2: Safe Drainage Features and Work Zones covers solutions to common roadway safety issues and work zone safety.

This training is not intended to be a design guide. Participants may want to contact their State Local Technical Assistance Program (LTAP) for more details on drainage design.

OUTCOMES

Upon completion of the course, participants will be able to:

- Identify problems created by ponding and standing water on the roadway
- Describe safety issues related to ditches and side slopes
- Describe how drainage features can become safety hazards
- Identify methods for identifying drainage problems
- Recall conditions to look for during field inspections
- Explain how to fix or prevent common roadway side slope problems
- Describe work zone safety procedures

TARGET AUDIENCE

This training is intended to help local road agency maintenance workers understand the importance of maintaining and upgrading drainage features on their road system to avoid an unsafe condition.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 1 HOURS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-380109

Course Title
Innovative Intersections and Interchanges

Motorists, pedestrians, and bicyclists face greater mobility challenges and safety risks at intersections as traffic volumes grow and congestion worsens. Agencies need safer, more balanced designs that keep people moving. Innovative intersection designs offer many safety and operational benefits, and are being built more often because they can deliver more for less. The Federal Highway Administration (FHWA) launched the Every Day Counts (EDC) state-based initiative to identify and rapidly deploy proven but underutilized innovations aimed at reducing project delivery time, enhancing roadway safety, reducing congestion, and improving environmental sustainability. In 2012, Intersection & Interchange Geometrics (IIG) was selected as a featured innovative technology in EDC Round-2. IIG consists of a family of innovative intersection designs that improve intersection safety while also reducing delay, and at lower cost and with fewer impacts than comparable traditional solutions.

In continuing effort to advance the deployment of innovative intersection designs, NHI is pleased to offer this training workshop to assist transportation professionals in better understanding these intersections and the potential benefits they can provide when correctly implemented.

Outcomes
Upon completion of the course, participants will be able to:

• Describe the principal features of the innovative geometric designs presented including key design and operational features
• List the advantages and disadvantages of their use
• Assess what innovative designs would be applicable at a given location given the conditions and constraints
• Identify resources to acquire additional information on these designs and their implementations

Target Audience
The target audience for this training includes state and local transportation agency personnel, and/or consultants having responsibilities for developing and designing elements pertaining to intersections and interchanges.

Training Level: Intermediate

Fee: 2022: $400 Per Person; 2023: $450 Per Person

Length: 1 DAYS (CEU: .6 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873  nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-380109V

COURSE TITLE
Innovative Intersections and Interchanges (VIRTUAL DELIVERY)

The NHI-380109 - Innovative Intersections and Interchanges is now offered as a virtual course. A virtual instructor-led training provides 100% remote learning while ensuring participants have access to expert instructors, workshop activities, and engaging peer-to-peer discussions.

Motorists, pedestrians, and bicyclists face greater mobility challenges and safety risks at intersections as traffic volumes grow and congestion worsens. Agencies need safer, more balanced designs that keep people moving. Innovative intersection designs offer many safety and operational benefits, and are being built more often because they can deliver more for less. The Federal Highway Administration (FHWA) launched the Every Day Counts (EDC) state-based initiative to identify and rapidly deploy proven but underutilized innovations aimed at reducing project delivery time, enhancing roadway safety, reducing congestion, and improving environmental sustainability. In 2012, Intersection & Interchange Geometrics (IIG) was selected as a featured innovative technology in EDC Round-2. IIG consists of a family of innovative intersection designs that improve intersection safety while also reducing delay, and at lower cost and with fewer impacts than comparable traditional solutions.

In continuing effort to advance the deployment of innovative intersection designs, NHI is pleased to offer this training workshop to assist transportation professionals in better understanding these intersections and the potential benefits they can provide when correctly implemented.

OUTCOMES
Upon completion of the course, participants will be able to:

• Describe the principal features of the innovative geometric designs presented including key design and operational features
• List the advantages and disadvantages of their use
• Assess what innovative designs would be applicable at a given location given the conditions and constraints
• Identify resources to acquire additional information on these designs and their implementations

TARGET AUDIENCE
The target audience for this training includes state and local transportation agency personnel, and/or consultants having responsibilities for developing and designing elements pertaining to intersections and interchanges.

TRAINING LEVEL: Intermediate

FEE: 2022: $400 Per Person; 2023: $400 Per Person

LENGTH: 6 HOURS (CEU: .6 UNITS)

CLASS SIZE: MINIMUM: 15; MAXIMUM: 20

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-380116

COURSE TITLE
Speed Management

The negative consequences of speeding impact more than just one type of crash, person or place. The causes and effects of speeding-related crashes are often cross-cutting and preventative safety measures should be addressed in a comprehensive speed management program. In this transportation training, participants learn lifesaving countermeasures that shape speed management programs and how these can help communities combat speeding-related injuries and deaths.

This 1-day Instructor-led training emphasizes how state and local governments can improve community safety by integrating speed management principles into three critical safety focus areas: roadway departures, intersections, and pedestrians and bicyclists.

Training participants will discuss:
What percentage of roadway departure crashes are speeding-related?
Which types of intersections have the most speeding-related crashes?
What vehicle speed is hazardous for pedestrians and bicyclists?

Participants who complete this transportation training will be able to appropriately apply safety strategies and countermeasures to reduce traffic fatalities from speeding as part of a comprehensive speed management program.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the three safety focus areas identified by the Federal Highway Administration (FHWA) to target with a speed management program.
• Identify speeding-related safety problems in the three safety focus areas
• Explain how engineering, enforcement, and education efforts can be coordinated to effectively manage speed
• Identify and apply appropriate safety strategies and countermeasures for each of the three focus areas
• Identify approaches for evaluating road segments and posting appropriate speed limits

TARGET AUDIENCE
The target audience of the FHWA Speed Management training includes Federal, State, tribal, and local transportation professionals, as well as law enforcement and other public safety advocates who are interested in having safer roadways through the application of speed management principles. This course is designed for learners at a basic or intermediate training level.

TRAINING LEVEL: Basic

FEE: 2022: $400 Per Person; 2023: $450 Per Person

LENGTH: 1 DAYS (CEU:.6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov

HIGHWAY SAFETY
COURSE NUMBER
FHWA-NHI-380117

COURSE TITLE
Combating Roadway Departures
This course provides participants with some tools for addressing roadway departure crashes. Topics covered in this course include a discussion of engineering countermeasures as well as implementation strategies.

OUTCOMES
Upon completion of the course, participants will be able to:
• Describe the Roadway Departure crash problem
• Discuss countermeasures to:
  • Reduce potential for leaving the roadway
  • Reduce potential for a crash if a vehicle does leave the roadway
  • Minimize severity if a crash does occur
• Compare methods for deploying countermeasures

TARGET AUDIENCE
The target audience for the course includes Federal, State and local highway engineers, consulting highway design engineers, and maintenance workers. This training program is intended for individuals that have the responsibility for identifying, recommending, selecting, installing and/or maintaining appropriate countermeasures to help improve highway safety.

TRAINING LEVEL: Basic

FEE: 2022: $300 Per Person; 2023: $400 Per Person

LENGTH: 1 DAYS (CEU: 0 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Signing and Markings for Complex Freeway Interchanges

Most practitioners agree, we need a well-defined process for developing an effective guide-sign design plan. This course provides a systematic approach for developing and evaluating designs that inform highway users how to safely navigate complex freeway interchanges. This course reviews applicable standards and policies, as well as relevant principles from AASHTO—A Policy on Geometric Design (Chapter 10), NCHRP 600 Series (Human Factors), Chapters 18-21, and the MUTCD (Chapters 2D & 2E and Part 3)—to illustrate and help you identify the degree of flexibility you may have in the development and design process.

This course introduces you to the three fundamental building blocks of effective guide sign designs, Sign Design Group (SDG), Sign Type (ST) and Sign Design Layouts. You will learn how lane geometry principles such as exit lane elimination, auxiliary lanes, and lane balance can impact signing and marking layouts. You will gain a better understanding of option lane signing flexibility provided by the Manual on Uniform Traffic Control Devices (MUTCD).

You will interact with various complex interchanges to identify and discuss current and potential interchange guide signing and markings with the goal of consistency, maintaining motorists’ expectations, and corridor management of guide sign designs.

Before beginning this course, participants are strongly encouraged to review four 15-minute pre-recorded PowerPoint lessons covering definitions and foundations concepts. Participants will build upon these lessons during the workshop.

OUTCOMES

Upon completion of the course, participants will be able to:

- Identify key human factors that influence the effectiveness of roadway signing and markings
- Describe key geometric concepts of interchange exit, including lane configurations and elimination methods
- Summarize the resultant effects of geometric decisions upon signing and marking
- State the relationship and factors which influence Sign Design Group, Sign Type, and Sign Design Layout
- Apply the process for designing the appropriate signing and markings layouts for optimum driver understanding and action execution

TARGET AUDIENCE

Engineers, engineering practitioners, technologists, involved in freeway and expressway design, construction, and operations. The target audience for this course should also include personnel and consultants in Roadway Design, Traffic Engineering, and other state District/Division offices or anyone who is responsible for development and planning, design and review of TCDs (signing and markings).

TRAINING LEVEL: Intermediate

FEE: 2022: $400 Per Person; 2023: $450 Per Person

LENGTH: 1 DAYS (CEU: .6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-380120

Course Title
Introducing Human Factors in Roadway Design and Operations

This course, Implementing Human Factors into Roadway Design: A Workshop on How to Use and Apply the Human Factors Guidelines (HFG) for Road Systems, helps participants gain an understanding of the HFG and how they can apply the principles to road system design and operational decisions. This course provides an overview of human factors as they relate to the roadway environment and describes why it is necessary to incorporate human factors in the design and operation of roadways as a complement to existing standards and manuals for roadway design and operation. Finally, the course offers a review of specific guidelines, as well as scenario-based case studies that allow attendees to apply the HFG to real roadway situations.

Outcomes
Upon completion of the course, participants will be able to:

• Describe basic human characteristics relevant to being a road user.
• List ways in which the vehicle, road user, and roadway elements interact to influence operations and safety outcomes.
• Identify how individual characteristics impact a road user's experience of the road environment.
• Describe the HFG and list its intended usage.
• Describe how the HFG relates to reference sources such as the HSM, MUTCD, and AASHTO's Policy on Geometric Design of Highways and Streets.
• Select and apply specific HFG guidelines for roadway location or design engineering elements to common scenarios.
• Select and apply specific HFG guidelines for traffic engineering elements to common scenarios.
• Analyze case studies, identify critical human factors issues associated with these case studies, and select applicable guidance from the HFG.

Target Audience
The primary audience for the HFG course is composed of the following: Engineers (state departments of transportation (DOT), metropolitan planning organizations (MPO), counties, local municipalities, and consultants to the public agencies) Safety Engineers Traffic Engineers Design Engineers Safety (non-engineers) Professionals (state DOTs, MPOs, counties, local municipalities, and consultants to the public agencies) Planners (state DOTs, MPOs, counties, local municipalities, and consultants to the public agencies)

Training Level: Basic

Fee: 2022: $400 Per Person; 2023: $450 Per Person

Length: 2 DAYS (CEU: 1.2 UNITS)

Class Size: Minimum: 20; Maximum: 30

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
COURSE NUMBER
FHWA-NHI-380122A

COURSE TITLE
Safety Data and Analysis Fundamentals Training for Data Analysts

This web-based training (WBT) is tailored to the participant's individual goal and/or role within an organization. Individual learning tracks are provided for Data Analysts, Data Collectors, Project/Program Managers and Safety Advocates. Participants enroll in one of these four tracks that most closely matches their personal goals and responsibilities. Refer to the “Target Audience” section for more information.

NHI’s Safety Data and Analysis Fundamentals course helps transportation professionals understand safety data and collection methods, including how to interpret safety data and use it to support key decision-making efforts. It's important for data collection practices to keep up with the latest safety data analysis tools and methodologies, to accurately forecast trends. Accurate forecasts help identify optimal times for project deployment and help improve program results.

This web-based training (WBT) provides the knowledge necessary to identify weaknesses in current practices and strengthen the way safety data is used in transportation programs, projects, and communities. Course participants learn about key safety data types and terms, as well as sources and collection methods. Participants study the data analysis process and several methods of data analysis, and also explore and interpret various examples throughout the training. They leave the training with the skills and knowledge necessary to evaluate data and to enhance data collection and storage methods, with awareness of the potential, as well as the limitations of these methods.

OUTCOMES
Upon completion of the course, participants will be able to:

- Use data to support decision-making, with respect to identifying safety issues, selecting countermeasures to mitigate safety issues, and evaluating the success of those countermeasures.
- Identify basic terms and concepts related to safety data and analysis, enabling participants to communicate effectively on safety-related data projects.
- Identify types, sources, strengths, and weaknesses of transportation safety data.
- Explain various methods used to analyze safety data, including their application and limitations.

TARGET AUDIENCE
DATA ANALYSTS - 7 hours (0.7 CEUs) - For professionals in charge of integrating and analyzing datasets, including highway safety engineers, specialists, traffic engineers, highway designers, and technical analysts. Emphasizes the applicability, uses, strengths, limitations, and requirements of safety data and collection methods. Recommended for anyone whose responsibility is to analyze safety data to identify causes and potential patterns that contribute to crashes and other systemic safety issues.

TRAINING LEVEL: Basic

FEE: 2022: $0 Per Person; 2023: $0 Per Person

LENGTH: 7 HOURS (CEU: .7 UNITS)

CLASS SIZE: MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-380122B

Course Title
Safety Data and Analysis Fundamentals Training for Data Collectors/Stewards

This web-based training is tailored to the participant’s individual goal and/or role within an organization. Individual learning tracks are provided for Data Analysts, Data Collectors, Project/Program Managers and Safety Advocates. Participants enroll in one of these four tracks that most closely matches their personal goals and responsibilities. Refer to the “Target Audience” section for more information.

NHI’s Safety Data and Analysis Fundamentals course helps transportation professionals understand safety data and collection methods, including how to interpret safety data and use it to support key decision-making efforts. It’s important for data collection practices to keep up with the latest safety data analysis tools and methodologies, to accurately forecast trends. Accurate forecasts help identify optimal times for project deployment and help improve program results.

This web-based training provides the knowledge necessary to identify weaknesses in current practices and strengthen the way safety data is used in transportation programs, projects, and communities. Course participants learn about key safety data types and terms, as well as sources and collection methods. Participants study the data analysis process and several methods of data analysis, and also explore and interpret various examples throughout the training. They leave the training with the skills and knowledge necessary to evaluate data and to enhance data collection and storage methods, with awareness of the potential, as well as the limitations of these methods.

Outcomes
Upon completion of the course, participants will be able to:

- Use data to support decision-making, with respect to identifying safety issues, selecting countermeasures to mitigate safety issues, and evaluating the success of those countermeasures.
- Identify basic terms and concepts related to safety data and analysis, enabling participants to communicate effectively on safety-related data projects.
- Identify types, sources, strengths, and weaknesses of transportation safety data.
- Explain various methods used to analyze safety data, including their application and limitations.

Target Audience
DATA COLLECTORS/STEWARDS - 4 hours (0.4 CEUs) - For professionals who are responsible for collecting, coding, and managing data to support safety analysis and decision-making. Emphasizes ways data collectors meet the needs of data analysts and helps collectors understand how managers use data to make strategic, informed decisions about safety priorities. Recommended for law enforcement officers, emergency medical service providers, trauma registrars, driver and vehicle service clerks, roadway data collectors, and anyone responsible for collecting crash, traffic, roadway, behavioral, injury, or other safety data.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 4 HOURS (CEU: .4 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov

Web site: www.nhi.fhwa.dot.gov • E-mail: nhicustomerservice@dot.gov
**COURSE NUMBER**
FHWA-NHI-380122C

**COURSE TITLE**
Safety Data and Analysis Fundamentals Training for Project and Program Managers

This web-based training is tailored to the participant’s individual goal and/or role within an organization. Individual learning tracks are provided for Data Analysts, Data Collectors, Project/Program Managers and Safety Advocates. Participants enroll in one of these four tracks that most closely matches their personal goals and responsibilities. Refer to the “Target Audience” section for more information.

NHI’s Safety Data and Analysis Fundamentals course helps transportation professionals understand safety data and collection methods, including how to interpret safety data and use it to support key decision-making efforts. It’s important for data collection practices to keep up with the latest safety data analysis tools and methodologies, to accurately forecast trends. Accurate forecasts help identify optimal times for project deployment and help improve program results.

This web-based training provides the knowledge necessary to identify weaknesses in current practices and strengthen the way safety data is used in transportation programs, projects, and communities. Course participants learn about key safety data types and terms, as well as sources and collection methods. Participants study the data analysis process and several methods of data analysis, and also explore and interpret various examples throughout the training. They leave the training with the skills and knowledge necessary to evaluate data and to enhance data collection and storage methods, with awareness of the potential, as well as the limitations of these methods.

**OUTCOMES**
Upon completion of the course, participants will be able to:

- Use data to support decision-making, with respect to identifying safety issues, selecting countermeasures to mitigate safety issues, and evaluating the success of those countermeasures.
- Identify basic terms and concepts related to safety data and analysis, enabling participants to communicate effectively on safety-related data projects.
- Identify types, sources, strengths, and weaknesses of transportation safety data.
- Explain various methods used to analyze safety data, including their application and limitations.

**TARGET AUDIENCE**
PROJECT and PROGRAM MANAGERS - 5 hours (0.5 CEUs) - For transportation professionals responsible for using safety analytics to identify and prioritize safety issues, develop and implement safety countermeasures, and evaluate project/program effectiveness. Emphasis on the trade-offs of project alternatives in terms of cost and benefits, including the safety impacts of the project/program as well as the individual components. Recommended for transportation planners, traffic records coordinating committee members, highway safety online directors, and State and local mid-level managers such as division and district program managers in highway safety, design, traffic engineering, enforcement, and public health.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $0 Per Person; 2023: $0 Per Person

**LENGTH:** 5 HOURS (CEU: .5 UNITS)

**CLASS SIZE:** MINIMUM: 0; MAXIMUM: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-380122D

Course Title
Safety Data and Analysis Fundamentals Training for Senior Managers and Safety Advocates

This web-based training is tailored to the participant's individual goal and/or role within an organization. Individual learning tracks are provided for Data Analysts, Data Collectors, Project/Program Managers and Safety Advocates. Participants enroll in one of these four tracks that most closely matches their personal goals and responsibilities. Refer to the “Target Audience” section for more information.

NHI’s Safety Data and Analysis Fundamentals course helps transportation professionals understand safety data and collection methods, including how to interpret safety data and use it to support key decision-making efforts. It's important for data collection practices to keep up with the latest safety data analysis tools and methodologies, to accurately forecast trends. Accurate forecasts help identify optimal times for project deployment and help improve program results.

This web-based training provides the knowledge necessary to identify weaknesses in current practices and strengthen the way safety data is used in transportation programs, projects, and communities. Course participants learn about key safety data types and terms, as well as sources and collection methods. Participants study the data analysis process and several methods of data analysis, and also explore and interpret various examples throughout the training. They leave the training with the skills and knowledge necessary to evaluate data and to enhance data collection and storage methods, with awareness of the potential, as well as the limitations of these methods.

Outcomes
Upon completion of the course, participants will be able to:

- Use data to support decision-making, with respect to identifying safety issues, selecting countermeasures to mitigate safety issues, and evaluating the success of those countermeasures.
- Identify basic terms and concepts related to safety data and analysis, enabling participants to communicate effectively on safety-related data projects.
- Identify types, sources, strengths, and weaknesses of transportation safety data.
- Explain various methods used to analyze safety data, including their application and limitations.

Target Audience
SENIOR MANAGERS & SAFETY ADVOCATES - 5 hours (0.5 CEUs) - For anyone looking to bridge the gap between the public and practitioners, and who are responsible for developing or influencing policies, practices, setting budgets, allocating resources, and making safety investments. Emphasis on understanding the needs of data collectors, data managers, and data analysts in terms of equipment, human resources, and organizational structure. Recommended for State and local senior managers, such as division heads/Chief of Transportation, Planning, Civil Engineering, and Public Health.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 5 HOURS (CEU: .5 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov

Web site: www.nhi.fhwa.dot.gov • E-mail: nhicustomerservice@dot.gov
Course Number
FHWA-NHI-380124A

Course Title
Road Safety Fundamentals

The Road Safety Fundamentals course will benefit participants who want to enhance road safety and reduce fatalities by identifying and solving common road safety issues, analyzing and evaluating roadway data, and developing actionable strategies and steps.

This self-paced course provides information on road safety, including foundational concepts; the history of road safety; multidisciplinary approaches; understanding human behavior; the types, quality, and importance of safety data; solving safety problems through a safety management process; and the steps and process of implementing road safety efforts.

Participants will explore the foundational concepts of road safety through problem solving common safety issues, evaluating data for various road safety objectives, and strategizing actionable steps to enhance road safety and reduce fatalities. Participants will grasp the fundamental concepts of road safety and help develop a workforce that is better prepared to address road safety challenges.

Outcomes
Upon completion of the course, participants will be able to:

• Explain the fundamental concepts of road safety
• Analyze multiple human behavior factors that influence behavior in road safety
• Select, analyze, and evaluate data for different road safety objectives
• Apply safety data to identify safety issues and develop strategies to solve those issues
• Identify the main elements of implementing road safety efforts

Target Audience
There are two primary audiences for the course: (1) practitioners with jobs that address some aspect of safety, (2) and professors and students in a university setting seeking to explore concepts and practices in roadway safety.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 12 Hours (CEU: 1.2 Units)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-380125

Course Title
Introduction to Data Driven Safety Analysis (DDSA)

To take the course, you do not need to be a statistical expert. Instead, you need to come with an open mind about the potential to use more reliable safety analysis methods to inform decisions throughout the planning and project development process.

In this course, you will learn about some of the potential limitations of current safety analysis methods such as crash frequency and crash rate as well as more reliable methods such as the use of predicted and expected crashes. You will then learn how to determine the appropriate scale and scope of a safety analysis effort and the associated data requirements. An important focus of the course is on the application of results and how the results can (and cannot) be used. Throughout the course, you will learn how to ‘talk the talk’ so you can confidently discuss the results of DDSA with technical and non-technical audiences, including other transportation professionals and the public. If you want to ‘walk the walk’, there are a number of other trainings resources available. You’ll learn about these as well. While this foundational course will cover the basic terms and explain the benefits of DDSA, it should stimulate the learners to engage in DDSA efforts within their agency and provide the direction they need to seek additional information and support as needed.

DDSA supports performance-based decision making, which is intended to focus the expenditure of public funds on programs and projects that will best achieve well-defined performance goals. Since safety performance goals are to reduce or eliminate severe and fatal crashes, the ability to skillfully apply safety analysis tools is a critical need. While many resources already exist for the various safety analysis topics (i.e., use of the Highway Safety Manual, the Interactive Highway Safety Design Model), there is not currently an introductory course that helps build a common understanding of safety analysis. This training will help to establish common terms and help transportation professionals understand how they can influence the safety performance of the transportation system through their decisions.

Outcomes
Upon completion of the course, participants will be able to:
• Explain the value of using DDSA to support decision-making
• Describe the application of DDSA methods to consider safety performance.
• Identify data to support DDSA methods and decisions.
• Communicate the results of DDSA to other transportation and safety professionals.
• Identify tools and resources to support DDSA

Target Audience
This course has both a primary and secondary target audience. Primary audience - Technical people, not necessarily high-level decision makers - design engineers, project managers, people in planning/design/operations. Secondary audience - decision makers, non-technical people.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 8 HOURS (CEU: .8 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-380126

Course Title
Where Highways Meet Rails: Crossing Safety

This course will help participants assess, evaluate, and enhance crossing safety in their jurisdictions. It will also cover the planning and funding process for crossing improvement projects.

The training provides information on rail-highway crossings, grade crossing components, including program/project development and administration. Course activities provide the participants a chance to engage with the content in meaningful ways and includes such items as historical background, railroad-highway intersection definition and components, collection and maintenance of data, assessment of crossing safety and operations, identification and selection of alternate improvements, program and project development and implementation, maintenance, and other topics. Throughout the course, participants submit questions and assignments through a monitored mailbox and should anticipate responses within 1 business week or sooner.

Participants work at their own pace, accessing the course materials and assignments via NHI “My Training” page.

Outcomes
Upon completion of the course, participants will be able to:

• 1) Explain the adverse impacts of incidents at highway-rail crossings
• 2) Identify the components, types, characteristics, and dynamics of highway-rail crossings
• 3) Employ designated resources for assessing crossing safety
• 4) Identify regulations and requirements applicable to highway-rail crossings
• 5) Evaluate highway-rail crossing for safety issues
• 6) Select safety enhancements for given crossing environments and situations
• 7) Navigate the planning and funding process for effectively improving safety at crossings

Target Audience
The target audience for this course includes personnel responsible for the design, construction, and/or maintenance of highway-rail crossings, or those responsible for grade crossing safety. Such personnel may include planners, engineers, and other roles from Federal, State, and local transportation agencies, as well as contractors, consultants, and construction representatives.

Training Level: Intermediate

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 24 HOURS (CEU: 2.4 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-380122B

Course Title
Safety Data and Analysis Fundamentals Training for Data Collectors/Stewards

This web-based training is tailored to the participant’s individual goal and/or role within an organization. Individual learning tracks are provided for Data Analysts, Data Collectors, Project/Program Managers and Safety Advocates. Participants enroll in one of these four tracks that most closely matches their personal goals and responsibilities. Refer to the “Target Audience” section for more information.

NHI’s Safety Data and Analysis Fundamentals course helps transportation professionals understand safety data and collection methods, including how to interpret safety data and use it to support key decision-making efforts. It’s important for data collection practices to keep up with the latest safety data analysis tools and methodologies, to accurately forecast trends. Accurate forecasts help identify optimal times for project deployment and help improve program results.

This web-based training provides the knowledge necessary to identify weaknesses in current practices and strengthen the way safety data is used in transportation programs, projects, and communities. Course participants learn about key safety data types and terms, as well as sources and collection methods. Participants study the data analysis process and several methods of data analysis, and also explore and interpret various examples throughout the training. They leave the training with the skills and knowledge necessary to evaluate data and to enhance data collection and storage methods, with awareness of the potential, as well as the limitations of these methods.

Outcomes

Upon completion of the course, participants will be able to:

• Use data to support decision-making, with respect to identifying safety issues, selecting countermeasures to mitigate safety issues, and evaluating the success of those countermeasures.

• Identify basic terms and concepts related to safety data and analysis, enabling participants to communicate effectively on safety-related data projects.

• Identify types, sources, strengths, and weaknesses of transportation safety data.

• Explain various methods used to analyze safety data, including their application and limitations.

Target Audience

DATA COLLECTORS/STEWARDS - 4 hours (0.4 CEUs) - For professionals who are responsible for collecting, coding, and managing data to support safety analysis and decision-making. Emphasizes ways data collectors meet the needs of data analysts and helps collectors understand how managers use data to make strategic, informed decisions about safety priorities. Recommended for law enforcement officers, emergency medical service providers, trauma registrars, driver and vehicle service clerks, roadway data collectors, and anyone responsible for collecting crash, traffic, roadway, behavioral, injury, or other safety data.

Training Level: Basic

Fee: 2022: $0 Per Person; 2023: $0 Per Person

Length: 4 HOURS (CEU: .4 UNITS)

Class Size: Minimum: 0; Maximum: 0

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Course Number
FHWA-NHI-420018

Course Title
Instructor Development Course (3.5-Day)

The Instructor Development Course prepares current and potential instructors to deliver learner-centric instruction using pre-developed and designed instructional materials. This course helps broaden and enhance your current knowledge, skills, and abilities required to conduct training for adult learners. This is not a presentation skills course, but one that teaches participants how to tap into Adult Learning Principles and improve an instructor’s ability to meet the needs of an adult learner.

A skilled trainer, therefore, will emphasize the use of experiential learning techniques, such as problem-solving analysis, discussion, question and answer sessions, group activities, demonstrations, role-plays, etc. In essence, these learning activities tap into the knowledge and skills that an adult learner brings to the classroom and have the goal of meeting both the learning outcomes and the participants’ expectations.

Pre-Class Assignment:
Training Sessions: You must come prepared to present a 15-minute training session at the beginning of the workshop. The topic for your session should be job related; it can either come from a course you have taught, will be teaching, or are developing.

Readings: Reading material will be sent to you 2-3 weeks prior to the training session.

This course is part of the NHI Instructor Certification program. To learn more about NHI’s Instructor Certification visit the NHI Web site at https://www.nhi.fhwa.dot.gov/resources/course-instruction.aspx.

Outcomes
Upon completion of the course, participants will be able to:

• Identify critical training competencies for instructors
• List strategies to address adult learning needs in a classroom environment
• Demonstrate the proper use of learning outcomes when delivering lessons
• Use visual aids and teaching strategies to support a 15-minute training delivery
• Deliver a 15-minute training that incorporates the approved learning outcomes, in an interactive manner and using appropriate instructional strategies, training media, and evaluation methods

Target Audience
This course is intended for instructors who will be delivering training for adult learners.

Training Level: Basic

Fee: 2022: $900 Per Person; 2023: $900 Per Person

Length: 3.5 DAYS (CEU: 2.1 UNITS)

Class Size: Minimum: 7; Maximum: 12

NHI Customer Service: (877) 558-6873 • nhicustomerservice@dot.gov
Instructor Development Course (IDC) for Web Conference Training (WCT)

The Instructor Development Course (IDC) for Web Conference Training (WCT) is a blended learning course consisting of live, WCTs and self-paced, web-based trainings (WBTs). It is designed to teach instructors who have taken the IDC for Instructor-Led Training course how to effectively deliver interactive training through NHI's web conferencing software. The IDC for WCT will provide new and experienced instructors the knowledge and skills needed to deliver online training that keeps participants engaged. Participants will also get insight into the logistics behind preparing for the delivery of online training.

Participants need access to both a telephone and an internet connection to participate in the live, WCT sessions. The course is estimated to take 12 hours to complete over a period of 3.5 days. It is comprised of 10.7 hours of instructor-led WCT and 1.5 hours of self-paced WBT.

**COURSE SEQUENCE**

PRIOR TO LIVE LESSONS:

Lesson 2 (Self-paced, WBT): During this self-paced lesson, participants learn the basics of how to use NHI's web conferencing software. It is estimated to take one hour to complete.

Lesson 3 (Self-paced, WBT): This is a brief video demonstration which is designed to teach participants how to set up their own teach back room which will be used to deliver a presentation at the end of the course. This presentation will serve as the course assessment.

LIVE SESSIONS

Lesson 1 (Live, WCT): This lesson is a live, 30-minute session which orients participants to the course layout.

Lesson 2 REVIEW OF THE PREREQUISITE LESSONS: (Self-paced, WBT): During this self-paced lesson, participants learn the basics of how to use NHI's web conferencing software. It is estimated to take one hour to complete.

Lesson 3 REVIEW OF THE PREREQUISITE LESSONS: (Self-paced, WBT): This is a brief video demonstration which is designed to teach participants how to set up their own teach back room which will be used to deliver a presentation at the end of the course. This presentation will serve as the course assessment.

Lesson 4 (Live, WCT): In this session, participants will learn more about distance learning and the roles and responsibilities of everyone involved in making distance learning a success. This session is estimated to take two hours.

Lesson 5 (Live, WCT): In this session, participants will learn the key characteristics of how to deliver effective WCT instruction. This session is scheduled for two hours.

Lesson 6 (Live, WCT): In this live, two hour session, participants will learn how to properly prepare to deliver training through a web conferencing platform.

Lesson 7 (Live, WCT): This live, two hour session serves as the performance assessment for the course. Participants will deliver an 8-10 minute presentation through NHI’s web conferencing software. Upon completing delivery, participants will receive feedback from the course facilitator(s) and the other participants. These sessions will be recorded for later review so participants can gain greater insight into their strengths and practice any areas for improvement.

In between WCTs, participants will have the opportunity to ask questions/post comments in an intersession chat room. This chat room will be monitored by the course facilitator(s) and any questions will be addressed at the beginning of each live, WCT.

OUTCOMES

Upon completion of the course, participants will be able to:

- Explain Distance Learning and the purpose of a Web Conference Training (WCT).
- Identify the NHI Instructor’s role in the training.
- Identify the main features and tools available for a WCT.
- Demonstrate effective content delivery skills for a WCT.

TARGET AUDIENCE
This course is intended for instructors who will develop and/or deliver interactive training to adult learners through web conferencing.

**TRAINING LEVEL:** Basic

**FEE:** 2022: $50 Per Person; 2023: N/A

**LENGTH:** 12 HOURS (CEU: 1.2 UNITS)

**CLASS SIZE:** MINIMUM: 6; MAXIMUM: 10

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
**Course Number**
FHWA-NHI-420051

**Course Title**
Instructor Introduction to Video Conference Training (VCT) - Web-Based

This training is provided to you at no cost by the National Highway Institute.

This training provides basic information on video conference training, or VCT, and tips on how to present information effectively during a VCT session. This training will also discuss some of the specific challenges in communicating at a distance using video conferencing and how to meet those challenges.

**Outcomes**
Upon completion of the course, participants will be able to:
- Identify video conference equipment
- Describe how to prepare for a VCT
- List characteristics of effective instructors in a VCT environment
- Explain how to interact from a distance

**Target Audience**
This course is intended for instructors who will be delivering interactive video conference training to adult learners.

**Training Level:** Basic

**Fee:** 2022: $0 Per Person; 2023: $0 Per Person

**Length:** 1 HOURS (CEU: 0 UNITS)

**Class Size:** MINIMUM: 1; MAXIMUM: 1

**NHI Customer Service:** (877) 558-6873 • nhicustomerservice@dot.gov
NHI STORE PROVIDES RESOURCES AND REFERENCE MATERIALS

Created based on customer feedback, the NHI Store is an online resource that enables users to order course materials through the NHI Web site. These materials can be used to plan a workshop, support train-the-trainer programs, or gather highway-related reference materials. The NHI Store offers both electronic downloads and hard copy versions.

To search for and purchase NHI course training materials, please visit www.nhi.fhwa.dot.gov. Easy directions are provided for ordering and payment; special instructions are provided for FHWA employees.

If you are unable to find the training materials you need, please contact us at nhitraining@dot.gov.

The following pages list all materials available for purchase at the time this catalog was published. For the most up-to-date listing, visit the NHI Store at www.nhi.fhwa.dot.gov. Credit card payment is accepted.

**LEGEND**

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**Main Contacts**

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