



COURSE NUMBER

FHWA-NHI-380003

COURSE TITLE

Design and Operation of Work Zone Traffic Control (1-Day)

This course provides participants with information on the safest and most efficient work zone traffic controls, including the application of effective design and installation concepts; and using signs and markings for detours, construction zones, and maintenance sites. The legal, administrative, and operational aspects also will be discussed. Classroom presentations include lectures, case histories, and workshops.

This course is part of the Certificate of Accomplishment in Work Zone Safety. To learn more about how you can achieve a certificate in Work Zone Safety visit the NHI Web site at http://www.nhi.fhwa.dot.gov/training/cert_programs.aspx.

OUTCOMES

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

- Describe each step involved in providing work zone traffic controls
- Identify and apply workable concepts and techniques for designing, installing, and maintaining controls in construction, maintenance, and utility operations
- Identify appropriate principles in the design of traffic control plans
- Apply traffic control plans to site conditions, monitor traffic controls, and make changes indicated by traffic accidents and incidents
- Discuss techniques and procedures used by different agencies
- Assess the legal consequences of action and inaction relative to work zone traffic control and identify risk management procedures

TARGET AUDIENCE

Design, construction, and maintenance personnel responsible for designing, installing, and monitoring work zone traffic control.

TRAINING LEVEL: Intermediate

FEE: \$220 Per Person

LENGTH: 1.0 DAY (CEU: 0.6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Morris Oliver • (202) 366-2251 • morris.oliver@dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov



This course is part of the Work Zone Safety NHI Certificate of Accomplishment Program. Successfully complete and pass these NHI courses to enhance your depth and breadth of knowledge and expertise in this discipline.

*FHWA-NHI-380003 Design and Operation of Work Zone Traffic Control
FHWA-NHI-380060 Work Zone Traffic Control for Maintenance Operations
FHWA-NHI-380063 Construction Zone Safety Inspection
FHWA-NHI-380072 Advanced Work Zone Management and Design*

**COURSE NUMBER**

FHWA-NHI-380003A

COURSE TITLE**Design and Operation of Work Zone Traffic Control (3-Day)**

This course provides participants with information on the safest and most efficient work zone traffic controls, including the application of effective design and installation concepts; and using signs and markings for detours, construction zones, and maintenance sites. The legal, administrative, and operational aspects also will be discussed. Classroom presentations include lectures, case histories, and workshops.

OUTCOMES

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

- Describe each step involved in providing work zone traffic controls
- Identify and apply workable concepts and techniques for designing, installing, and maintaining controls in construction, maintenance, and utility operations
- Identify appropriate principles in the design of traffic control plans
- Apply traffic control plans to site conditions, monitor traffic controls, and make changes indicated by traffic accidents and incidents
- Discuss techniques and procedures used by different agencies
- Assess the legal consequences of action and inaction relative to work zone traffic control and identify risk management procedures

TARGET AUDIENCE

Design, construction, and maintenance personnel responsible for designing, installing, and monitoring work zone traffic control.

TRAINING LEVEL: Intermediate

FEE: \$420 Per Person

LENGTH: 3.0 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Morris Oliver • (202) 366-2251 • morris.oliver@dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.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 training, participants will be able to:

- Develop and implement improvements to railroad-highway grade crossings
- Identify and evaluate techniques and engineering principles used for all 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

FEE: \$320 Per Person

LENGTH: 2.0 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Guan Xu • (202) 366-5892 • guan.xu@fhwa.dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov



If you're interested in this course, you may also want to take advantage of other NHI safety courses.

FHWA-NHI-151042 Safety Conscious Planning: Planning it Safe

FHWA-NHI-142045 Pedestrian Facility Design

FHWA-NHI-142045 Bicycle Facility Design

FHWA-NHI-137030 Road Weather Management

FHWA-NHI-137044 Improving Highway Safety with Intelligent Transportation Systems (ITS)

FHWA-NHI-133078 Access Management, Location, and Design



COURSE NUMBER

FHWA-NHI-380032A

COURSE TITLE

Roadside Safety Design (3-Day)

This course has been expanded and updated to provide 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.

OUTCOMES

Upon completion of the training, 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: \$420 Per Person

LENGTH: 3.0 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Frank Julian • (404) 562-3689 • frank.julian@fhwa.dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov



Looking for safety courses about lane departure?

FHWA-NHI-380032A AASHTON Roadside Design Guide

FHWA-NHI-380034 (1-Day) Design, Construction, and Maintenance of Highway Safety Appurtenances and Features

FHWA-NHI-380034A (2-Day) Design, Construction, and Maintenance of Highway Safety Appurtenances and Features

FHWA-NHI-380034A (2-Day) Design, Construction, and Maintenance of Highway Safety Appurtenances and Features

FHWA-NHI-380070 Safety and Operational Effects of Geometric Design Features

**COURSE NUMBER**

FHWA-NHI-380034

COURSE TITLE**Design, Construction, and Maintenance of Highway Safety Appurtenances and Features (1-Day)**

The course has been developed for a 3-day course presentation but can also be structured into a 1- or 2-day training course. The sponsoring agency will be able to choose the modules for presentation that will best meet its needs. The course covers the design, construction, and maintenance of highway safety appurtenances and features. It covers the purpose and performance requirements of state-of-the-art highway safety features, such as breakaway sign supports, breakaway utility poles, traffic barriers, impact attenuators, traversable terrain, and hardware features such as drainage inlets. The course describes how these features function, what can go wrong, and how to recognize and correct improper installations.

OUTCOMES

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

- Identify advantages and disadvantages of different types of longitudinal barriers and crash cushions
- Identify National Cooperative Highway Research Program 350 tested safety appurtenances
- Identify application of highway safety appurtenances, why they are used, when and where they should be used, and what is necessary to ensure their function
- Design the placement of, and determine the need for, longitudinal barriers
- Use required installation, construction, and maintenance procedures for proprietary longitudinal barriers, terminals, transitions, crash cushions, bridge railings, and sign supports
- Recognize substandard or potentially hazardous highway appurtenances and features
- Develop alternatives to eliminate, correct, or mitigate unsatisfactory operational characteristics of existing safety devices

TARGET AUDIENCE

Highway engineers, including local personnel involved in the design, construction, or maintenance of highway safety appurtenances and features. This course is suitable for all local, State, and Federal employees that are involved with the installation and repair of highway appurtenances.

TRAINING LEVEL: Accomplished**FEE:** \$220 Per Person**LENGTH:** 1.0 DAY (CEU: 0.6 UNITS)**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30**NHI Training Information:** (703) 235-0534 • nhitraining@dot.gov**Subject Matter Contact:** Frank Julian • (404) 562-3689 • frank.julian@fhwa.dot.gov**NHI Training Program Manager:** Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov

**COURSE NUMBER**

FHWA-NHI-380034A

COURSE TITLE**Design, Construction, and Maintenance of Highway Safety Appurtenances and Features (2-Day)**

The course has been developed for a 3-day course presentation but can also be structured into a 1- or 2-day training course. The sponsoring agency will be able to choose the modules for presentation that will best meet its needs. The course covers the design, construction, and maintenance of highway safety appurtenances and features. It covers the purpose and performance requirements of state-of-the-art highway safety features, such as breakaway sign supports, breakaway utility poles, traffic barriers, impact attenuators, traversable terrain, and hardware features such as drainage inlets. The course describes how these features function, what can go wrong, and how to recognize and correct improper installations.

OUTCOMES

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

- Identify advantages and disadvantages of different types of longitudinal barriers and crash cushions
- Identify National Cooperative Highway Research Program 350 tested safety appurtenances
- Identify application of highway safety appurtenances, why they are used, when and where they should be used, and what is necessary to ensure their function
- Design the placement of, and determine the need for, longitudinal barriers
- Use required installation, construction, and maintenance procedures for proprietary longitudinal barriers, terminals, transitions, crash cushions, bridge railings, and sign supports
- Recognize substandard or potentially hazardous highway appurtenances and features
- Develop alternatives to eliminate, correct, or mitigate unsatisfactory operational characteristics of existing safety devices

TARGET AUDIENCE

Highway engineers, including local personnel involved in the design, construction, or maintenance of highway safety appurtenances and features. This course is suitable for all local, State, and Federal employees that are involved with the installation and repair of highway appurtenances.

TRAINING LEVEL: Accomplished**FEE:** \$320 Per Person**LENGTH:** 2.0 DAYS (CEU: 1.2 UNITS)**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 30**NHI Training Information:** (703) 235-0534 • nhitraining@dot.gov**Subject Matter Contact:** Frank Julian • (404) 562-3689 • frank.julian@fhwa.dot.gov**NHI Training Program Manager:** Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov

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**COURSE NUMBER**

FHWA-NHI-380034B

COURSE TITLE**Design, Construction, and Maintenance of Highway Safety Appurtenances and Features (3-Day)**

The course has been developed for a 3-day course presentation but can also be structured into a 1- or 2-day training course. The sponsoring agency will be able to choose the modules for presentation that will best meet its needs. The course covers the design, construction, and maintenance of highway safety appurtenances and features. It covers the purpose and performance requirements of state-of-the-art highway safety features, such as breakaway sign supports, breakaway utility poles, traffic barriers, impact attenuators, traversable terrain, and hardware features such as drainage inlets. The course describes how these features function, what can go wrong, and how to recognize and correct improper installations.

OUTCOMES

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

- Identify advantages and disadvantages of different types of longitudinal barriers and crash cushions
- Identify National Cooperative Highway Research Program 350 tested safety appurtenances
- Identify application of highway safety appurtenances, why they are used, when and where they should be used, and what is necessary to ensure their function
- Design the placement of, and determine the need for, longitudinal barriers
- Use required installation, construction, and maintenance procedures for proprietary longitudinal barriers, terminals, transitions, crash cushions, bridge railings, and sign supports
- Recognize substandard or potentially hazardous highway appurtenances and features
- Develop alternatives to eliminate, correct, or mitigate unsatisfactory operational characteristics of existing safety devices

TARGET AUDIENCE

Highway engineers, including local personnel involved in the design, construction, or maintenance of highway safety appurtenances and features. This course is suitable for all local, State, and Federal employees that are involved with the installation and repair of highway appurtenances.

TRAINING LEVEL: Accomplished

FEE: \$420 Per Person

LENGTH: 3.0 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Frank Julian • (404) 562-3689 • frank.julian@fhwa.dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov



COURSE NUMBER

FHWA-NHI-380060

COURSE TITLE

Work Zone Traffic Control for Maintenance Operations (Short Term)

This course provides guidance and training for field personnel working in the planning, selection, application, and operation of short-term work zones. The course addresses typical short-term maintenance activities occurring on two-lane rural highways and multilane urban streets and highways. The course covers the applicable standards for work zone protection contained in the "Manual on Uniform Traffic Control Devices" (MUTCD), discussing the need for proper application of devices, while addressing liability issues of highway agencies and individuals. Classroom presentation includes practical exercises to plan, set up, operate, and remove work zone safety devices, including appropriate flagging procedures for these operations.

This course is part of the Certificate of Accomplishment in Work Zone Safety. To learn more about how you can achieve a certificate in Work Zone Safety visit the NHI Web site at http://www.nhi.fhwa.dot.gov/training/cert_programs.aspx.

OUTCOMES

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

- Apply traffic control through short-term and mobile work areas
- Use national work zone standards and requirements as contained in Part VI of the MUTCD
- Use standard traffic control devices in work zones
- Design and install traffic control schemes for short-term and mobile operations on rural two- and multilane streets and highways
- Apply proper flagging procedures
- Minimize liability exposure for agencies performing utility and maintenance operations

TARGET AUDIENCE

State, county, and utility personnel, such as maintenance crews, survey crews, and utility crews, who are responsible for establishing traffic controls through short-term, utility, and maintenance work areas.

TRAINING LEVEL: Accomplished

FEE: \$220 Per Person

LENGTH: 1.0 DAY (CEU: 0.6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Morris Oliver • (202) 366-2251 • morris.oliver@dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov



This course is part of the Work Zone Safety NHI Certificate of Accomplishment Program. Successfully complete and pass these NHI courses to enhance your depth and breadth of knowledge and expertise in this discipline.

*FHWA-NHI-380003 Design and Operation of Work Zone Traffic Control
FHWA-NHI-380060 Work Zone Traffic Control for Maintenance Operations
FHWA-NHI-380063 Construction Zone Safety Inspection
FHWA-NHI-380072 Advanced Work Zone Management and Design*



COURSE NUMBER

FHWA-NHI-380063

COURSE TITLE

Construction Zone Safety Inspection (1-Day)

This course provides training in the management of traffic control plans and the inspection of construction zone safety devices. Participants receive instruction in traffic control plan review, inspection of traffic control procedures and safety devices, and the resolution of discrepancies from the traffic control plan, as well as on deficiencies in safety hardware maintenance. The following major topics are covered: Inspection of traffic control plan operation, maintenance of work zone signs and markings, inspection of construction safety hardware, and resolution of discrepancies from contract requirements.

This course is part of the Certificate of Accomplishment in Work Zone Safety. To learn more about how you can achieve a certificate in Work Zone Safety visit the NHI Web site at http://www.nhi.fhwa.dot.gov/training/cert_programs.aspx.

OUTCOMES

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

- Recognize the importance of construction zone safety devices
- Identify the contract requirements for selected devices
- Inspect the installation and operation of safety devices, including discrepancies and deficiencies in safety devices
- Resolve discrepancies from the contract requirements and ensure corrections in the deficient safety devices

TARGET AUDIENCE

FHWA safety engineers, FHWA highway engineers, and State and local personnel involved in the management of traffic control plans and the inspection of construction zone safety devices.

TRAINING LEVEL: Accomplished

FEE: \$220 Per Person

LENGTH: 1.0 DAY (CEU: 0.6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Morris Oliver • (202) 366-2251 • morris.oliver@dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov



This course is part of the Work Zone Safety NHI Certificate of Accomplishment Program. Successfully complete and pass these NHI courses to enhance your depth and breadth of knowledge and expertise in this discipline.

- FHWA-NHI-380003 Design and Operation of Work Zone Traffic Control*
- FHWA-NHI-380060 Work Zone Traffic Control for Maintenance Operations*
- FHWA-NHI-380063 Construction Zone Safety Inspection*
- FHWA-NHI-380072 Advanced Work Zone Management and Design*



COURSE NUMBER

FHWA-NHI-380063A

COURSE TITLE

Construction Zone Safety Inspection (1.5-Day)

This course provides training in the management of traffic control plans and the inspection of construction zone safety devices. Participants receive instruction in traffic control plan review, inspection of traffic control procedures and safety devices, and the resolution of discrepancies from the traffic control plan, as well as on deficiencies in safety hardware maintenance. The following major topics are covered: Inspection of traffic control plan operation, maintenance of work zone signs and markings, inspection of construction safety hardware, and resolution of discrepancies from contract requirements.

OUTCOMES

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

- Recognize the importance of construction zone safety devices
- Identify the contract requirements for selected devices
- Inspect the installation and operation of safety devices, including discrepancies and deficiencies in safety devices
- Resolve discrepancies from the contract requirements and ensure corrections in the deficient safety devices

TARGET AUDIENCE

FHWA safety engineers, FHWA highway engineers, and State and local personnel involved in the management of traffic control plans and the inspection of construction zone safety devices.

TRAINING LEVEL: Accomplished

FEE: \$255 Per Person

LENGTH: 1.5 DAYS (CEU: 0.9 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Morris Oliver • (202) 366-2251 • morris.oliver@dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov



If you're interested in this course, you may also want to take advantage of other NHI safety courses.

FHWA-NHI-151042 Safety Conscious Planning: Planning it Safe

FHWA-NHI-142045 Pedestrian Facility Design

FHWA-NHI-142045 Bicycle Facility Design

FHWA-NHI-137030 Road Weather Management

FHWA-NHI-137044 Improving Highway Safety with Intelligent Transportation Systems (ITS)

FHWA-NHI-133078 Access Management, Location, and Design

**COURSE NUMBER**

FHWA-NHI-380069

COURSE TITLE**Road Safety Audits/Assessments**

Course is currently under revision to incorporate better context for local host conditions, discussion of low-cost improvements, and issues of speed management.

Performing effective road safety audits (RSAs) improves safety and demonstrates to the public an agency's dedication to crash reduction. This course provides practical information on how to conduct a road safety audit, location selection, building independent, multi-disciplinary teams and the steps to successful RSAs. Discussions on costs, time, liability and benefits, focus on the common myths and concerns surrounding RSAs. Participants learn how to improve transportation safety by applying a new proactive approach to RSAs. This approach includes examination of a future or existing roadway by an independent, qualified audit team.

The course includes hands-on application of the training materials, which include information on the history and definition of RSAs, the importance of safety, the stages of a road safety audit, how to conduct a road safety audit, easy-to-use-checklists, and legal considerations. A copy of "FHWA Road Safety Audit Guidelines" is provided.

OUTCOMES

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

- Express the road safety audit process terminology
- Perform a simple road safety audit, as a member of a team
- Assess the benefits of a road safety audit on a local or statewide basis

TARGET AUDIENCE

Federal, State, and local transportation personnel who are likely to serve on a road safety audit team. Consultants who conduct highway safety studies should also attend.

TRAINING LEVEL: Accomplished

FEE: \$320 Per Person

LENGTH: 2.0 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Craig Allred • (720) 963-3236 • craig.allred@fhwa.dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov



COURSE NUMBER

FHWA-NHI-380070

COURSE TITLE

Safety and Operational Effects of Geometric Design Features

This 2-day 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.

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 training, 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: \$320 Per Person

LENGTH: 2.0 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Gene Amparano • (816) 329-3909 • gene.amparano@fhwa.dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov



Looking for safety courses about lane departure?

FHWA-NHI-380032A AASHTON Roadside Design Guide

FHWA-NHI-380034 (1-Day) Design, Construction, and Maintenance of Highway Safety Appurtenances and Features

FHWA-NHI-380034A (2-Day) Design, Construction, and Maintenance of Highway Safety Appurtenances and Features

FHWA-NHI-380034A (2-Day) Design, Construction, and Maintenance of Highway Safety Appurtenances and Features

FHWA-NHI-380070 Safety and Operational Effects of Geometric Design Features

**COURSE NUMBER**

FHWA-NHI-380070A

COURSE TITLE**Safety Effects of Geometric Design Features for Two-Lane Rural Highways**

This 1-day 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.

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 training, 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: \$220 Per Person

LENGTH: 1.0 DAY (CEU: 0.6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Gene Amparano • (816) 329-3909 • gene.amparano@fhwa.dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov



COURSE NUMBER

FHWA-NHI-380070B

COURSE TITLE

Safety Effects of Geometric Design Features for Multilane Highways

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.

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 training, 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: \$220 Per Person

LENGTH: 1.0 DAY (CEU: 0.6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Gene Amparano • (816) 329-3909 • gene.amparano@fhwa.dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov



If you're interested in this course, you may also want to take advantage of other NHI safety courses.

FHWA-NHI-151042 Safety Conscious Planning: Planning it Safe

FHWA-NHI-142045 Pedestrian Facility Design

FHWA-NHI-142045 Bicycle Facility Design

FHWA-NHI-137030 Road Weather Management

FHWA-NHI-137044 Improving Highway Safety with Intelligent Transportation Systems (ITS)

FHWA-NHI-133078 Access Management, Location, and Design



COURSE NUMBER

FHWA-NHI-380071

COURSE TITLE

Interactive Highway Safety Design Model

This course instructs highway design project managers, planners, designers, and traffic and safety reviewers in the application of the Interactive Highway Safety Design Model (IHSDM) software and provides guidance on interpretation of the output.

IHSDM is a suite of software tools to evaluate safety of two-lane rural highways. The software, developed for FHWA, was released in 2003 after several years of research and development to provide state-of-the-art techniques for safety analysis. IHSDM contains five tools that can be used to apply the most recent safety analysis techniques in a relatively straightforward and automated manner. For more information about IHSDM, go to <http://www.tfrc.gov/safety/ihsdm/ihsdm.htm>.

Participants gain hands-on experience with the software. Therefore, the training facility must be equipped with computers. There should be no more than two participants per computer. Minimum system specifications for the computers are as follows: Operating System - Microsoft Vista, Windows XP or Windows 2000 Professional; HTML Browser - Microsoft Internet Explorer, Netscape Navigator, or Firefox; Spreadsheet Program, Microsoft Excel or equivalent; Hardware - At least 450 MHz Pentium III (or equivalent) CPU, 256 MB RAM or greater desirable, 800x600 high colors (16 bit) display; and 300 MB free disk space

OUTCOMES

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

- Describe key capabilities and limitations of IHSDM
- Evaluate a two-lane rural highway using IHSDM
- Recognize when and how IHSDM can be used in the project development process

TARGET AUDIENCE

Highway design project managers, planners, designers, and traffic and safety reviewers with at least one or two years of experience with highway design, preferably two-lane rural highway design.

TRAINING LEVEL: Accomplished

FEE: \$320 Per Person

LENGTH: 2.0 DAYS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Clayton Chen • (202) 493-3054 • clayton.chen@fhwa.dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov



COURSE NUMBER

FHWA-NHI-380072

COURSE TITLE

Advanced Work Zone Management and Design

This 3-day training course provides participants with advanced levels of knowledge and competencies with technical and non-technical aspects of work zone traffic control practices including work zone planning, design, project management, and contract issues. The course designed to provide maximum flexibility by including core, recommended, and optional lessons. The default course consists of the core and recommended lessons. Each participant receives a copy of the "Advanced Work Zone Management and Design" reference manual and a participant workbook that contains all lesson materials.

OUTCOMES

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

- Apply the latest safety and mobility design concepts as it relates to temporary traffic control (TTC) plans for work zones
- Identify the latest MUTCD principles as it relates to TTC plans for planning, design, project management, and describe the various contracting issues that may need to be resolved
- Demonstrate knowledge of the latest concepts as related to Parts 1, 5 and 6 of the MUTCD
- Demonstrate knowledge of key concepts in the AASHTO Design Guide and other standards as related to such items as worker and flagger apparel (such as ANSI and similar standard guides)
- Evaluate work zone temporary traffic control designs for nighttime and daytime issues
- Analyze and evaluate operational, safety and mobility impacts of work zones, including scheduling, scope, phases and alternate routes
- Consider the application of ITS technologies and where applicable apply ITS technologies to work zone planning, design and execution
- Consider alternative innovations, best practices and recent research findings in work zone planning, design and execution
- Develop temporary transportation management plans for safety and mobility
- List elements necessary for successful contracts and identify strategies for resolving contract issues, including best practices in work zone contracting, also identify tools to resolve conflicts with contracting issues
- Identify and resolve community issues, including impacts of work zones on affected residential and business areas. Apply public participation, outreach, and work zone strategies to minimize or mitigate community impacts with respect to work zones
- Identify and analyze specific (key) issues and concerns that affect work zone design and demonstrate ability to explain safety and mobility issues, impacts and alternatives to peers, public and/or decision makers
- Summarize work zone safety and mobility impacts and alternatives

TARGET AUDIENCE

State, and local design engineers, traffic and safety engineers, senior work zone traffic engineers, transportation planners, employees of metropolitan. planning organizations and board members, regional planners, regional construction engineers (with work zone experience), and senior engineering technicians.

TRAINING LEVEL: Accomplished

FEE: \$420 Per Person

LENGTH: 3.0 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Morris Oliver • (202) 366-2251 • morris.oliver@dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov

**COURSE NUMBER**

FHWA-NHI-380073

COURSE TITLE**Fundamentals of Planning, Design and Approval of Interchange Improvements to the Interstate System**

This course provides participants with a basic knowledge of freeway systems and interchange types, FHWA policy on justification for interchange access approval, and applications of technical knowledge and policy understanding to interchange project decisions. Topics covered in this course include service and system interchange types, 8-point interchange justification process, interchange study and selection process, fundamentals of freeway system operations and planning, urban freeway diagnosis, geometric design considerations, and technical and documentation procedures.

OUTCOMES

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

- Compare and contrast design and operational attributes of different of freeway interchange types
- Interpret and apply the elements of the FHWA Policy for approving Interstate access
- Describe and apply principles of good freeway systems and interchange design
- Describe the application of design exceptions to interchange project decisions
- Describe the content of an appropriate safety and operational analysis to support an access request
- Compare alternative designs based upon an assessment of appropriate measures of effectiveness (MOEs)
- Apply an interchange design study procedure

TARGET AUDIENCE

The target audience for the course includes traffic engineers and transportation professionals with one to five years of working experience.

TRAINING LEVEL: Accomplished

FEE: \$420 Per Person

LENGTH: 3.0 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Mark Doctor • (404) 562-3732 • mark.doctor@fhwa.dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov

**Looking for safety related courses for intersections?**

FHWA-NHI-133078 Access Management, Location and Design

FHWA-NHI-380005 Railroad-Highway Grade Crossing Improvement Program

FHWA-NHI-380073 Fundamentals of Planning, Design, and Approval of Interchange Improvements to the Interstate System

FHWA-NHI-380074 Designing and Operating Intersections for Safety

**COURSE NUMBER**

FHWA-NHI-380074

COURSE TITLE**Designing and Operating Intersections for Safety**

Through numerous interactive discussions, exercises, and case studies, this course examines various aspects of design and operations and how they affect the safety of an intersection and its various users. The full course contains a total of six modules: Users and Intersections, Diagnostics and Countermeasures, Geometric Design, Unsignalized Intersections, Signalized Intersections, and Case Studies.

OUTCOMES

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

- List the user groups to consider
- Describe user characteristics and how they affect intersection design and safety
- Describe approaches to balance needs of different user groups
- Review how to determine which intersections have poor crash experience
- Review how to assess causes of high crash experience or high potential
- Describe how to select appropriate countermeasures
- Define intersection design objectives, controls, and focus area
- Identify key safety-related intersection geometric design decisions, applications, and assumptions
- Describe the measured and potential safety improvements that result from key intersection geometrics
- Describe safety issues at unsignalized intersections
- Summarize MUTCD requirements for signaling an intersection
- Select appropriate countermeasures to address safety issues at unsignalized intersections
- Identify common safety concerns at signalized intersections
- Discuss contributing factors to safety concerns
- Select countermeasures to the safety of signalized intersections

TARGET AUDIENCE

The target audience for the course includes traffic engineers and transportation professionals with one to five years of work experience.

TRAINING LEVEL: Accomplished

FEE: \$420 Per Person

LENGTH: 3.0 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Christopher Webster • (404) 562-3915 • cwebster@dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov



Looking for safety courses about bicycles and pedestrians?

*FHWA-NHI-142045 Pedestrian Facility Design
FHWA-NHI-142046 Bicycle Facility Design*

**COURSE NUMBER**

FHWA-NHI-380075

COURSE TITLE**New Approaches to Highway Safety Analysis**

The primary purpose of this course is to help attendees gain an understanding of the Highway Safety Improvement Program (HSIP) process, safety engineering principles and human factors issues related to traffic and road safety. It also provides the participant with an explanation of the latest methods for identifying collision causes and selecting cost-effective safety improvements. Finally, this course will serve as a prerequisite for those who will be utilizing SafetyAnalyst, a set of software tools currently under development that are designed to assist State and local agencies to improve the decisionmaking process in implementing safety improvement projects.

OUTCOMES

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

- Describe the components of the Highway Safety Improvement Program (HSIP)
- Explain safety engineering principles relevant to planning for highway safety improvement measures specific to three types of crashes - roadway departures, intersection-related, and pedestrian
- Describe the relevance and impact of human factors in the planning of highway safety improvement measures for three types of crashes - roadway departures, intersection-related, and pedestrian
- Determine strategies for the selection of cost-effective highway safety improvement measures for three types of crashes - roadway departures, intersection-related, and pedestrian

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 include engineers, planners, and technicians.

TRAINING LEVEL: Accomplished

FEE: \$420 Per Person

LENGTH: 3.0 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Karen Yunk • (609) 637-4207 • karen.yunk@dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov



NHI training is led by top notch Instructors. See page 258 for more information about the Instructor Certification Program or contact our NHI Instructor Liaison at (703) 235-0010.

**COURSE NUMBER**

FHWA-NHI-380076

COURSE TITLE**Low-Cost Safety Improvements Workshop**

This course provides a comprehensive presentation of low-cost, ready-to-use improvements that enhance the safety of highways. The course covers a synthesis of countermeasures and their associated crash reduction factors as identified in the "AASHTO Strategic Highway Safety Plan NCHRP 500 Guidebooks." Countermeasures for specific areas of highway safety, including roadside hazards; signing, markings, and lighting; traffic control devices; intersections; traffic signals; and railroad grade crossings are discussed. The course also introduces recent low-cost safety improvements that have been developed by States and local engineers. Through exercises, participants learn how to analyze highway safety situations and apply appropriate countermeasures to those situations.

OUTCOMES

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

- Identify appropriate engineering countermeasures from crash patterns
- Recognize deficiencies in operation/design and select appropriate countermeasures for roadside hazards
- Recognize deficiencies in safety performance of signing, markings, and lighting, and elect appropriate countermeasures
- Recognize deficiencies in operation/design of intersections and select appropriate countermeasures
- Recognize deficiencies in operation/design of traffic signals and select appropriate countermeasures
- Recognize deficiencies in operation/design of railroad grade crossings and select appropriate countermeasures
- Illustrate new and innovative low-cost safety improvement measures developed by State DOTs

TARGET AUDIENCE

Federal, State, and local transportation, traffic and safety engineers, and planners involved in reducing crashes.

TRAINING LEVEL: Accomplished

FEE: \$220 Per Person

LENGTH: 1.0 DAY (CEU: 0.6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 35

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: John McFadden • (410) 962-2482 • john.mcfadden@fhwa.dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov

**COURSE NUMBER**

FHWA-NHI-380077

COURSE TITLE**Intersection Safety Workshop**

Beginning with an introduction to intersection and crash characteristics, this course provides information on ready-to-use, direct-application safety measures for rural unsignalized and signalized intersections. Participants are presented with a synthesis of countermeasures and their associated crash reduction factors as identified in the "AASHTO Strategic Highway Safety Plan - NCHRP 500 Guidebooks." The course focuses on the application of these countermeasures and design and safety operations best practices for substantive improvements to intersection safety. During the course, participants have the opportunity to present intersection safety situations that they are currently facing and discuss appropriate countermeasures and best practices to address those situations.

OUTCOMES

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

- Apply models (equations) to predict the number of crashes for an intersection based upon traffic volumes
- Identify high crash intersections and recognize appropriate engineering countermeasures
- Identify crash reduction factors/crash modification factors associated with countermeasures
- Describe safety performance of intersection geometric design features and the models to quantify the safety effect
- List regulatory, warning, and guide signing and markings countermeasures and associated safety benefits
- List highway lighting countermeasures and associated safety benefits
- List traffic signal countermeasures and associated safety benefits

TARGET AUDIENCE

Federal, State, and local transportation traffic and safety engineers, and planners involved in reducing intersection crashes.

TRAINING LEVEL: Accomplished

FEE: \$220 Per Person

LENGTH: 1.0 DAY (CEU: 0.6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Fred Ranck • (708) 283-3545 • fred.ranck@fhwa.dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov

**Looking for safety related courses for intersections?**

FHWA-NHI-133078 Access Management, Location and Design

FHWA-NHI-380005 Railroad-Highway Grade Crossing Improvement Program

FHWA-NHI-380073 Fundamentals of Planning, Design, and Approval of Interchange Improvements to the Interstate System

FHWA-NHI-380074 Designing and Operating Intersections for Safety

**COURSE NUMBER**

FHWA-NHI-380078

COURSE TITLE**Signalized Intersection Guidebook Workshop**

This course provides an overview of the "Signalized Intersections: Informational Guide FHWA-HRT-04-091." The guide is a comprehensive document containing methods for evaluating the safety and operations of signalized intersections and tools to remedy deficiencies. It takes 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.

OUTCOMES

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

- Recognize and apply fundamentals of signalized intersections in terms of user needs, geometric design, traffic design, and illumination
- Describe signalized intersection project process, safety analysis methods, and operational analysis methods
- Describe the more than 100 signalized intersection treatments and their advantages and disadvantages

TARGET AUDIENCE

Federal, State, and local transportation, traffic and safety engineers, and planners involved in planning, designing, operating, and remedying crash problems for signalized intersections.

TRAINING LEVEL: Intermediate

FEE: \$220 Per Person

LENGTH: 1.0 DAY (CEU: 0.6 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Fred Ranck • (708) 283-3545 • fred.ranck@fhwa.dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov



Looking for safety courses about bicycles and pedestrians?

FHWA-NHI-142045 Pedestrian Facility Design

FHWA-NHI-142046 Bicycle Facility Design



COURSE NUMBER

FHWA-NHI-380079

COURSE TITLE

AASHTO Roadside Design Guide

Get an overview of the AASHTO Roadside Design Guide. Emphasis is on current highway agency policies and practices. At the end of the course, you will be able to apply the clear zone concept to all classes of roadways and learn and apply other core competencies. This is a Web-based course. Participant must register online through the NHI Web site.

This course provides an overview of the AASHTO "Roadside Design Guide." Emphasis is on current highway agency policies and practices. The AASHTO "Roadside Design Guide" is the textbook for this course. Directions on how to obtain a copy of this book can be found on the NHI Web site.



OUTCOMES

Upon completion of the training, participants 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
- Select, design and install a traffic barrier
- Apply safety concepts to roadside features and appurtenance selection/use in work zones
- Compare alternate safety treatments and select a cost-effective design
- Identify policies and practices that are inconsistent with current state-of-the-art

TARGET AUDIENCE

Federal, State and local highway engineers involved in the formulation and/or application of policies and standards relating to the design of safer roadsides.

TRAINING LEVEL: Intermediate

FEE: FREE

LENGTH: 14.0 HOURS (CEU: 1.2 UNITS)

CLASS SIZE: MINIMUM: 1; MAXIMUM: 1

NHI Training Information: (703) 235-0534 • nhitraining@dot.gov

Subject Matter Contact: Frank Julian • (404) 562-3689 • frank.julian@fhwa.dot.gov

NHI Training Program Manager: Tom Elliott • (703) 235-0319 • thomas.elliott@fhwa.dot.gov



*Need help with the NHI Web site or enrolling in a Web-based training?
Call (703) 235-0556 or e-mail nhiwebmaster@dot.gov.*