



U.S. Department of Transportation
Federal Highway Administration



Office of Technical Services

NHI INSTRUCTOR-LED TRAINING STANDARDS GUIDE

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Introduction

Purpose and Scope

This document highlights National Highway Institute (NHI) standards for instructor-led training (ILT) deliverables.

Refer to the contract or task order (TO) for specific guidance on every project. Discuss any deviations from this document with the NHI Training Program Manager or Contracting Officer's Representative before performing work or delivering a product.

General Design Standards

Taxonomy and Course Structure

NHI courseware for instructor-led training can be developed using the following taxonomy:

- Course-Lesson, or
- Course-Module-Lesson

Segment the course into lessons only or into modules with associated lessons. Use the most appropriate structure for logical sequencing of course content.

Learning Outcomes

NHI courses must be designed around targeted and well constructed learning outcomes.

Find more guidance on course structure and learning outcomes, consult the NHI Style and Standards Guide:

https://www.nhi.fhwa.dot.gov/resources/intro_developing.aspx .

Standards for ILT Design Plans

Purpose

A design plan serves as the framework for developing course content. One purpose of the design plan is to establish that the finished training product will meet the training needs of the target audience and be designed in accordance with accepted instructional systems design practices.

General Requirements

Design NHI instructor-led courses to:

- Provide 6 to 6.5 hours of instructional time per day, excluding breaks and lunch.
- Allow adequate breaks. Where possible, provide a morning and afternoon break of 15 minutes or several 5-10 minute breaks scattered throughout the morning and afternoon sessions.
- Ensure that learners are not passive recipients of information, but are actively involved in the NHI learning experience. Include minimal one-way lecture time and use a variety of engaging instructional strategies and review, practice, and evaluation activities at appropriately paced intervals.

Example Design Plan

Refer to the **Developing an NHI Course** page on the NHI website for a design plan example:

https://www.nhi.fhwa.dot.gov/resources/intro_developing.aspx

Standards for Instructor Guides

Overview

The instructor guide (IG) is based on the approved design plan. The IG guides the instructor during delivery of an NHI course and thoroughly describes the procedures for setting up and teaching the course.

- Include a lesson plan before each lesson or module.
- Include transition from one topic or lesson to another by providing an appropriate segue, a wrap-up statement, or an introductory statement. Detail the ways in which one topic builds upon or ties into another topic.
- Generate complete and extensive instructor notes so that every instructor can teach the course as the developers and subject matter experts (SMEs) intended. However, the IG is not a script for the instructor to recite or read to the participants.
- Present instructor notes in a consistent format throughout the document.
- If desired and approved by the TPM, use visual cues to highlight participant activities, speaking points, possible questions to prompt discussion, answers to those questions, and time allotments for each section. A simple, consistently applied icon for each main heading in the IG notes may be appropriate.
- Include supporting material or cross-reference to related course materials.
- All case studies, workshop problems, computer exercises, and other instructional events must be described in complete detail in the IG. Include the rationale or purpose, any necessary details, the process for completing the activity, duration, debrief instructions, and summary or transition.

Required Elements

The IG includes, at minimum:

- Cover, including publication number (both provided by NHI)
- Table of contents
- Administrative information
- Introduction
 - Course overview or description
 - Description of target audience
 - Course goal and expected outcomes
 - Course coordination

- Class size
- Agenda (Should include time durations for each activity; however, specific times may be determined by the local host.)
- Instructor's checklist
 - Before the training event
 - During the training event
 - After the training event
- Lesson Plans
- Slides and content
- Directions and worksheets for completing exercises, calculations, activities, and case studies (as applicable) and answers or suggested responses for each
- List of abbreviations and acronyms
- Glossary
- List of references and source documents
- Other appendices as necessary

Lesson Plans

A lesson plan details the instructional methods for an individual lesson and provides adequate information for the instructor to plan his or her approach to the lesson. It contains an overview of the applicable information from the design plan.

A lesson plan is included at the beginning of each module or lesson in an NHI instructor guide. It includes, at minimum:

- Lesson number
- Lesson title
- Performance-based learning outcomes shown in relation to topic and evaluation method
- Sequenced and chunked content with associated instructional methods and instructional tools to be used
- Instructions for conducting the lesson, including information about transitioning from one lesson to the next
- Duration for each content area topic and activity
- Evaluation plan (interim and terminal)
- References and source documents
- Placement in instructional day

Example Instructor Guide Notes

The following sections provide an example of how to organize instructor notes:

Key Message

- Introduce a new topic or lesson here. Connect previous content to this new content.
- Summarize the main points or critical information that participants should recall from this slide or page. Capture the essence of the slide content; do not repeat slide titles or bullet points.

Background Information

- Explain any background or related information to support the slide.
- Provide information that may be used to answer questions or to elaborate on a topic, if necessary.
- Keep notes brief and to the point; use bullet format.
- Do not duplicate content from the slides or reference manual.
- Identify typical questions, regional, political or demographic issues, and possible solutions.

Interactivity

- Provide instructions for facilitating engagement opportunities. Provide possible classroom discussion starters, questions to gauge understanding (and suggested responses), or survey questions that the instructor can use to prompt curiosity, promote buy-in, or build consensus.
- Include transitions, purpose for the activity, recommended duration, complete instructions for facilitating and debriefing each step of an activity.
- Include wrap-up and summary for each activity.

Notes

- Describe any factors that might make it difficult for learners to understand or accept a key message.
- This field is often blank and is used by instructors to jot suggestions for future delivery of the course.

Additional Guidance

A Sample Instructor Guide is available from the **Developing an NHI Course** page on the NHI website and from the NHI Training Program Manager (TPM):

https://www.nhi.fhwa.dot.gov/resources/intro_developing.aspx

However, contractor recommendations are encouraged; the ideal IG layout is based on the type and level of content, needs of the target audience, and instructional methods.

Gain approval from the NHI TPM or Contracting Officer's Representative (COR) before producing the IG.

Standards for Participant Workbooks

Purpose

The participant workbook (PW) is an instructional support tool. It serves multiple functions during a course, including providing:

- Content and additional resource material
- Space for note taking
- A printed copy of visual aids used in traditional and virtual classrooms
- Directions and worksheets for activities, calculations, exercises, and case studies
- Resources, acronyms, and glossary

Format

The format of the workbook is an instructional design decision based on the type and amount of required technical content, supporting visuals, and adult learning principles. The PW format aligns contractual requirements with the most appropriate presentation of content. Discuss the preferred workbook format with the NHI TPM or COR before development.

The following are some general guidelines:

- NHI encourages text in the PW. When a reference manual is required and used in class, it contains most detailed text; however, without a reference manual, the workbook is more valuable as a job resource if it includes enough detail to provide guidance and clarification of bulleted items on slides.
- Determine the number of slides per page by ensuring that the slide and bullets are clear to the participants and that required narrative to explain the content or supplement the slide can be located in a sensible location on or near the same page.
- Insert charts and tables directly into the PW to maintain clarity. Do not insert the PowerPoint slide containing those graphic elements.

Required Elements

A typical participant workbook includes, at minimum:

- Cover, including publication number (both provided by NHI)
- Table of contents
- Introduction

- Course overview
- Course description
- Course goal
- Course outcomes
- Course agenda
- Course content
- Directions and worksheets for completing exercises, calculations, activities, and case studies (as applicable)
- List of abbreviations and acronyms
- Glossary
- List of references and source documents
- Other appendices (as necessary) including solutions to class exercises (if appropriate)

Standards for Reference Manuals

A reference manual (RM) includes detailed text, formulae, codes, graphs, tables, and other technical details that are used by the participants and instructor in class. The RM often resembles a textbook, and participants use the material therein to solve problems or reference additional information.

If a reference manual is provided to participants, the course must be designed to use that reference during the instructional period. By the end of a course, the participants should be thoroughly familiar with the manual, and should be able to use it effectively as a reference tool on the job.

Standards for Assessments

Level 1 Assessments

Level 1 assessments (evaluations) are shipped to each session with other NHI administrative products. These evaluation forms are standardized across NHI and do not need to be created by the contractor.

Level 2 Assessments

NHI typically requires development of a Level 2 end-of-course assessment to test participants' mastery of the learning outcomes. Two separate assessments are sometimes required in order to maintain a pool of acceptable questions and to ensure the integrity of the assessment. A project's contract specifies the requirements for assessments.

Example Assessment Methods

The end-of-course assessment may consist of objective methods, such as multiple choice or matching questions. Where appropriate, the method can be presented in performance-based formats, such as skill demonstrations, case studies, or presentations.

Typical assessment styles include the following:

- Multiple-choice
 - Consists of a stem and a selection of possible responses
 - Useful for testing knowledge
- Matching
 - Consists of two columns of related words, phrases, or symbols
 - Useful for testing terms and labels
- True and False
 - Consists of a single statement
 - Useful for testing knowledge
 - Use true and false (yes and no) questions sparingly; do not provide a reliable measure of learning. In no case should an assessment rely on more than 10 percent true and false questions.
- Completion or "fill in the blank"
 - Consists of a statement from which a word(s) or short phrase has been omitted
 - Useful for testing recall of knowledge and limited higher-order tasks

- Performance
 - Consists of a simulated or actual environment with certain conditions of performance and certain expected outcomes
 - Useful for testing job tasks and skills

Answer Keys and Rubrics

Assessment answer keys must include the correct answer(s) to each question, a justification or explanation, and the location of the reference (answer) within the training materials.

Any assessment must test mastery of the learning outcomes and include tools to mitigate subjectivity in grading or scoring. For case studies, presentations, and other performance-based formats, create a rubric that clearly states acceptable response criteria or parameters for evaluating participant responses or group processes.

Rubrics are often created in list format or in grid, or matrix, style. A rubric typically contains these elements:

- Performance standard
 - The performance standard reflects the learning outcome, task, or specific behavior that is being performed by the participant and evaluated by the instructor.
- A rating system
 - A scale (narrative or numerical, in most cases)
 - Descriptors or performance characteristics that indicate the level of performance
- Criteria for success or mastery, which can be tied to NHI's generally accepted criteria for passing grade (70 percent)

Transporting Assessments

Instructors carry NHI assessments to each session; assessments are not shipped to the site with other NHI products. Generally, assessment instruments are separate documents and are not included in the instructor guide.

Additional Guidance

Additional assessment standards are included in the NHI Style and Standards Guide available on the **Developing an NHI Course** page of the NHI website:

https://www.nhi.fhwa.dot.gov/resources/intro_developing.aspx

Standards for Instructional Documents

Effective document construction enhances usability and comprehension.

Cover

Use the cover template as provided by NHI for any printed product. Use the FHWA-NHI publication number as provided to generate a document's cover and spine and for inclusion in the file name.

If the course meets the IACET Standard for the offering of CEUs, be sure to use the cover that incorporates the IACET logo. For courses that do not meet the IACET Standard, use the alternate cover without the IACET logo.

Front Matter

This section provides standards that apply to front matter in all ILT documents.

Foreword or Introduction

Include the following information in the Foreword inside the front cover of the training materials:

- The purpose of the document
- A short summary of the contents
- A statement identifying the audience
- Whether the publication supersedes another
- Whether the publication is preliminary, interim, or final

Disclaimer Notices

Include the following disclaimers in the inside front cover:

1. Departmental disclaimer, under the caption "Notice": This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.
2. Disclaimer for product names or manufacturers, under the caption "Notice," if any appear in the training materials: The United States Government does not endorse products or manufacturers. Trademarks or manufacturers' names appear herein only because they are considered essential to the object of this document.

Technical Report Documentation Page

If required by the COR, insert a Technical Report Documentation page, Form DOT F 1700.7. The page is available in the appendix of this document.

Metric Conversion Factors Table

If required by the COR, insert a Metric Conversion Factors page, only if those measurements are used in the training materials. The page is available in the appendix of this document.

Acknowledgements

Credit lines or acknowledgments are allowed only when a nongovernment source loans or contributes materials that have not been purchased by FHWA. Do not include acknowledgements for the sole purpose of crediting an author or FHWA employee. Review the need for acknowledgements with the NHI Training Program Manager before including such language in the training materials.

The name of the contracted developer may appear in the Technical Report Documentation page referenced above.

Table of Contents

Do not include front matter, such as the foreword, disclaimer notices, technical report documentation, and metric conversion factors, in the table of contents since they precede the table of contents.

Set the table of contents in the same style as the body text. Include every section and certain subsection titles in all capitals or initial capital letters. Indent subheadings to emphasize their relationship to the main heading.

End Matter

This section provides standards that apply to end matter in all ILT documents.

Appendix

Include any supplemental materials in the appendix.

Glossary

Include all newly introduced terms and other relevant terms in the glossary.

Bibliography

A bibliography directs participants to the sources of material so that they can locate additional information on the subject. Provide the author, title, source, identifying number, pagination, and publication date. When citing published works, submit a bibliography that lists all references and citations. Following is an

example bibliography entry:

Minow, Newton N., and Craig L. LaMay. *Inside the Presidential Debates: Their Improbable Past and Promising Future*. Chicago: University of Chicago Press, 2008.

When citing an online publication, use the Digital Object Identifier (DOI) instead of the URL if the source article or book has been assigned one. For further guidance on references, citations, and bibliographies, refer to the *GPO Style Manual* and the *Chicago Manual of Style*.

Other Resources

Stakeholder discussions at the needs analysis phase typically generate references to NHI courses on related topics, as well as other publications and websites that pertain to the topic at hand. Provide a list of NHI courses, as well as other print and Web resources that would be helpful to a participant.

Formatting

This section provides standards that apply to formatting all ILT documents.

Font

Use a sans serif font, such as Arial or Verdana, and maintain consistent font size and type throughout the course. Below are typical font sizes for NHI instructor guides and participant workbooks.

Content type	Font size
Publication: first-level headings	16 pt bold
Publication: second-level headings	14 pt bold
Publication: content	12 pt

Table 1: Recommended Font Sizes

Reference manuals may be guided by other publishing criteria; consult contract documents for specific requirements.

Lists

A bulleted list includes two or more items written in parallel form. If the first item on the list is a phrase beginning with a verb, all other items should follow this format. If the first item is a complete sentence, then subsequent items in the list must be sentences.

Follow these additional guidelines when creating lists:

- Capitalize the first letter of the first word in all bulleted items.
- Use a period at the end of full sentences.
- Select a simple bullet style.
- Format the text and bullets so that font size does not exceed the standard text font size.
- Format bullets so their font size does not exceed the list items' size.
- Left-align the list.
- Sub-bullets may help organize ideas on printed material, but NHI recommends minimizing their use on PowerPoint slides.
- Use numbering instead of bullets if the order or sequence is important to the list content.

Tables and Figures

- Label all tables and figures consistently, and optimize them for accessibility.
- Label each table or figure with a unique title, caption, or figure number, and insert a list of tables and figures (with corresponding labels and page numbers).
- Consider how tables and figures will be positioned when printed. They should be placed near the relevant textual references—ideally on the same page or spread. In the case of a large table or figure that needs to be rotated in order to fit on the page, align the top of the table or figure with the left side of the page. Leave enough margin space so that the content is not obscured by the binding.

Footnotes

- Use a footnote at the bottom of the page only when directly referencing an information source.
- Use a separate set of numbers for table footnotes and text footnotes, and start numbering from 1 for each new chapter or section.
- Place footnotes for tables, graphs, and illustrations immediately beneath the item.

Headers and Footers

Add headers and footers to printed material.

- Insert the title of the course as a left-aligned header.
- Insert the type of document as a right-aligned header.
- Insert a single (1/2 point) separator line in the header, underneath the course title and document type.

- Insert the page number as a centered footer, ½ inch above the bottom margin.

Page Numbering

- Use lowercase Roman numerals for front matter and Arabic numerals for the body and back material of the training materials.
- Start chapters, sections, and appendices on right-facing, odd-numbered pages.
- Use a blank page as needed to start a chapter or section on the right-hand side. Assign blank pages a page number; it is acceptable but not required to print a number on the blank page. Provide a notice, such as “This page is intentionally blank,” to avoid empty pages that can confuse adaptive technology.

Spacing

- Set all text flush left, ragged right upper.
- Use a single space between sentences.
- Use a single line between paragraphs.
- Use 6 pt. spacing before and after bulleted items.
- Use two single lines between sections separated by a heading.
- Avoid text orphans and widows.

Special Formatting Notes for PowerPoint Presentations

- Display the NHI logo on the first slide of each presentation.
- Use a sans serif font that is no smaller than 24 point for readability of a projected presentation. Presentations are often used in a low light environment and projected as far as 35 feet from participants; make sure all content is readable.
- Use Arabic numerals instead of spelling out numbers when representing quantities in PowerPoint presentations. This guidance differs from that provided for training documents, such as instructor guides and participant workbooks.
- Use the Slide Master feature for background color and page numbering. Number slides in the lower right corner. Do not insert graphics onto the Slide Master.
- It is often advisable to include graphics directly in the participant workbook (as opposed to inserting the slide with smaller graphic).
- When inserting the slides into another document, such as the instructor guide or participant workbook, convert the slides from color to black and white.

Style, Language Use, and Standards Authorities

Use clear and concise language to minimize confusion and maximize learning. When updating an older course, make the necessary style changes so that the course conforms to NHI style and language usage expectations.

NHI adheres primarily to the references below for style guidance. When conflicts arise between the *GPO Style Manual* and *Chicago Style Manual*, the *GPO Style Manual* prevails. Consult *Webster's Third New International Dictionary* for spelling guidance.

- [Government Printing Office \(GPO\) Style Manual](#)
- [Chicago Manual of Style](#)
- [Federal Plain Language Guidelines](#) from the [Plain Writing Act of 2010](#)

The following standards apply based on contract requirements for a specific project:

- [Section 508](#) of the [Rehabilitation Act of 1973](#), as amended
- [International Association for Continuing Education and Training \(IACET\)](#)

Contractual requirements supersede this guide. Consult your development contract for specific requirements.

Intellectual Property, Mark and Signature, Graphics

Please see the NHI Style and Standards Guide for direction on addressing:

- Intellectual Property
- Mark and Signature
- Graphics

File Format and Naming Conventions

Consult the NHI Style and Standards Guide for file format and naming conventions.

Refer to the contract document and consult the NHI TPM or COR for specific requirements on the expected delivery approach, such as file transfer system, DVD, external drives, or other delivery mechanism.

Section 508 Compliance

NHI performs a variety of accessibility reviews on contractors' deliverables.

Please consult the NHI Style and Standards Guide for more information on Section 508 Compliance.

Appendices

Appendix A: Technical Report Documentation

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle		5. Report Date	
		6. Performing Organization Code	
7. Author(s)		8. Performing Organization Report No.	
9. Performing Organization Name and Address		10. Work Unit No. (TRAIS)	
		11. Contract or Grant No.	
12. Sponsoring Agency Name and Address		13. Type or Report and Period Covered	
		14. Sponsoring Agency Code	
15. Supplementary Notes			
Abstract			
Key Words		Distribution Statement	
Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price

Form DOT F 1700.7 (8-72)

Reproduction of completed page authorized

Appendix B: Metric Conversion Factors Table

SI* (MODERN METRIC) CONVERSION FACTORS				
APPROXIMATE CONVERSIONS TO SI UNITS				
Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH				
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
AREA				
in ²	square inches	645.2	square millimeters	mm ²
ft ²	square feet	0.093	square meters	m ²
yd ²	square yard	0.836	square meters	m ²
ac	acres	0.405	hectares	ha
mi ²	square miles	2.59	square kilometers	km ²
VOLUME				
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft ³	cubic feet	0.028	cubic meters	m ³
yd ³	cubic yards	0.765	cubic meters	m ³
NOTE: volumes greater than 1000 L shall be shown in m ³				
MASS				
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
TEMPERATURE (exact degrees)				
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C
ILLUMINATION				
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m ²	cd/m ²
FORCE and PRESSURE or STRESS				
lbf	poundforce	4.45	newtons	N
lbf/in ²	poundforce per square inch	6.89	kilopascals	kPa
APPROXIMATE CONVERSIONS FROM SI UNITS				
Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH				
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
AREA				
mm ²	square millimeters	0.0016	square inches	in ²
m ²	square meters	10.764	square feet	ft ²
m ²	square meters	1.195	square yards	yd ²
ha	hectares	2.47	acres	ac
km ²	square kilometers	0.386	square miles	mi ²
VOLUME				
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m ³	cubic meters	35.314	cubic feet	ft ³
m ³	cubic meters	1.307	cubic yards	yd ³
MASS				
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
TEMPERATURE (exact degrees)				
°C	Celsius	1.8C+32	Fahrenheit	°F
ILLUMINATION				
lx	lux	0.0929	foot-candles	fc
cd/m ²	candela/m ²	0.2919	foot-Lamberts	fl
FORCE and PRESSURE or STRESS				
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in ²

*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380. (Revised March 2003)