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National Highway Institute Instructor-led Training Standards Guide (ILT)

NATIONAL HIGHWAY INSTITUTE

U.S. Department of Transportation
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1. Introduction

This document provides specific guidance to the developer of ILT courseware. Refer to the Request for Proposal (RFP) for specific guidance on your specific project. Please refer any deviations from this document to your COTR.

1.1. Taxonomy and Course Structure

NHI courseware for ILT can be developed using the following taxonomy: **Course with lessons, or Course with Modules containing lessons.**

An instructor-led training course may be segmented in one of two formats: lesson only, or modules with associated lessons. Use the most appropriate structure for logical sequencing of course content.

Instructor-led Training

Course A	Course B
Lesson 1	**Module 1**
Lesson 2	Lesson 1
Lesson 3	Lesson 2
Lesson 4	**Module 2**
Lesson 5	Lesson 1
Lesson 6	Lesson 2

2. Standards for Preliminary Lesson Plans

A preliminary lesson plan (PLP) serves as the framework for developing the lesson plans for the IG. PLPs are used for benchmarking before course development begins. This helps the Government and the contractor to establish that the finished product will meet the training needs of the target audience and be designed in accordance with accepted instructional systems design practices.

- Structure the PLP to provide approximately six hours of instruction time per day, excluding breaks.
- Allow adequate breaks; no block of instruction should be longer than 90 minutes without a break for the course participants.
  - Generally, a morning and afternoon break of 15 minutes is provided. Lunch breaks usually allow one hour.
  - Time for breaks can be incorporated into the time allocated for the participants to complete group exercises, workshops, or other activities.
- Structure the course in an interactive format.
  - Ideally, a course will contain no more than 30% lecture or other one-way communication. In a typical hour, aim for no more than 18-20 minutes of lecture time.
  - A learner should not be a passive recipient of information, but actively involved in the learning experience.
- Include a variety of instructional strategies, such as lectures, facilitated discussions, group exercises, videos, individual practice, case studies, and other methods.
- Use accepted ISD methods and practices. (See Gagne and Driscoll, 1998, and Mager, 1988.)

The PLP includes, as a minimum:

- Course title
- Course introduction or description
- Target audience description, including any pre-requisites or assumed pre-training competencies
- Course goal and outcomes
- Course organization
- Class size
- Course agenda
- Draft, high-level lesson plans and visual notes

3. Standards for Lesson Plans

A lesson plan serves as the framework for developing a detailed description of the course of instruction for an individual lesson. A lesson plan addresses instructional methodology as it provides instructions for conducting the lesson as well as delivery.

The Lesson Plan includes, as a minimum:

- Lesson number
- Lesson title
- Performance-based learning outcomes
- Instructional methodology
  - Document the general content covered and how it will be addressed.
  - Present sequentially to capture the flow of instruction.
  - Include methods, such as question and answer sessions, lecture, demonstrations, small group discussions, problem solving exercises, or case studies.
- Instructions for conducting the lesson, including information about transitioning from one lesson to the next
- Instruction day
- Time allocation
- Evaluation plan
- References and source documents

4. Standards for Instructor Guide

The Instructor Guide (IG) is based on the approved PLP, and guides the instructor during delivery of a course. The IG must thoroughly describe the procedures for setting up and teaching the course.

A detailed, interactive lesson plan for each lesson or module is included before each lesson or module.

The IG helps an instructor transition from one lesson to another by providing an appropriate segue into a topic, a wrap-up statement, or an introductory statement. Also, it details the ways in which one topic builds upon or ties into another topic; this should occur frequently throughout the material, wherever appropriate.

An IG may provide the instructor with visual cues for 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.

The IG does not include a complete narrative that an instructor would recite or read to the participants.

Supporting material may be incorporated into the IG or cross-referenced to related course materials. Case histories, workshop problems, computer exercises, and other instructional tools must be described in complete detail in the IG.

The IG includes, as a minimum:

- Cover
- Table of Contents
- Introduction/Administrative section
  - Introduction.
  - Course overview/description.
  - Description of target audience.
  - Course goal.
  - Course outcomes.
  - Course coordination.
  - Class size.
  - Agenda and duration/timing for each lesson.
  - Instructor’s checklist.

  - Before the training event.
  - During the training event.
  - After the training event.
- Lesson plans
- Slides and content (this subset may be used to create the workbook)
- Exercises (with answers)
- List of abbreviations and acronyms
- Glossary
- List of references and source documents

4.1. Special Requirements: Instructor Notes in the IG

- Instructor notes are to be complete and extensive so that every instructor can teach the course as the developers and subject matter experts (SME) intended.
- The instructor notes should be presented consistently throughout the guide. (See example below for one suggested format. Other examples are provided as appendices to this document.)

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, workbook, or reference manual. ▪ Include directions for using slides to support the lecture. (Point out build features, explain how often to advance slides if not self-explanatory.)
Interactivity:	Provide comments or instructions for facilitating engagement opportunities here. 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 recommended duration for completing each step of an activity.
Notes:	Describe any factors that might make it difficult for learners to understand or accept a key message. Identify typical questions, regional, political or demographic issues, and possible solutions. This field provides an area for the instructor to note suggestions for future delivery of the course.

5. Standards for Participant Workbook

The Participant Workbook (PW) is an instructional support tool. It serves multiple functions during a course.

- Provides content.
- Provides space for note taking.
- Allows for additional views of the visual aids that are used in the virtual classroom.
- Documents directions for activities and any additional resource material required.
- Lists course resources and acronyms.
- Includes glossary.

The format of the PW is an instructional design decision; it aligns contractual requirements with the most appropriate presentation of content.

- Discuss the preferred workbook format with the project COTR before development.
  - The format of the workbook is an instructional design decision based upon the type and amount of required technical content, supporting visuals, and adult learning principles.
- NHI allows text in the PW.
- When a reference manual is required and used in class, it should contain most detailed text; however, without a reference manual, the workbook will be more valuable as a job resource if it includes enough detail to provide guidance and clarification of bulleted items on slides.
- The number of slides per page should be determined by the nature of the screen shot—with the intent that they are clear to the participants—and the required graphical or textual content for that page.
- If a PW page contains only screen shots, and they contain only bulleted text, two per page is adequate; if they depict photographs or detailed material, one slide per page may be more appropriate. (The preceding guidance on number of slides per page represents suggested format; this format is not a requirement.)
- Charts and tables should be inserted directly into the PW to maintain clarity. Do not insert the PP slide containing those graphic elements.

The PW includes, as a minimum:

- Cover.
- Table of contents.
- Introduction.
- Course overview.
- Course description.
- Course goal.
- Course outcomes.
- Course agenda
- Course material (content).
- Exercises (if applicable).
- List of abbreviations and acronyms.
- Glossary.
- List of references and source documents.

6. Standards for Visual Aids

For each lesson, develop the most suitable type of visual aid (or combination of aids) to support and reinforce the subject material or interactive components. Aids include PowerPoint presentations, computer graphics, photographs, video, animation, and graphs or tables.

- Use the most modern technology generally available to generate visuals, including computer-generated graphics.
  - Be aware that any computer software required for the visual aids must be readily available to any instructor; do not use proprietary software.
  - Be aware of contractual requirements that apply to development of a particular course; consult the contract to ensure compliance with accessibility standards.
- Final deliverables must include electronic copies of any presentations, software or simulations, or video. Also include access information for any Web pages used to conduct class.
- Provide electronic and hard copies of formulae, cross section(s) of plans, wall charts, and other media used by the instructor to conduct class.
- See *NHI Style and General Standards Guide*, “Style” section for guidance on PowerPoint expectations.
- When pulling PowerPoint slides into the IG or PW, ensure legibility and quality of graphics. Do not rely on color alone to convey information. Note that PWs are printed in black and white only.
  - Use dotted or dashed lines or different shapes in addition to color.
- PowerPoint slides must be clearly readable from the back of a room (at least 35’ feet from the projector screen) and in the PW in a dimly lighted classroom.
- Include suggestions and instructions in the instructor guide for generating in-class flip charts.
  - Flip chart notations can generate discussion, encourage participant interaction, and promote understanding of the material.
  - In the classroom, use standard best practices, including writing with dark colors in large letters that can be seen in the back of the room.

- Below you will find additional guidance regarding use of visual aids.
  - Scaled models made of a variety of materials are utilized within the classroom to demonstrate concepts and objects. Models may be located at a pre-determined area of the classroom or passed around the class, depending on size and instructional purpose.
  - Computer-based simulations enable the curriculum to demonstrate situations, functionalities, theories, activities, and other complex concepts that may not be possible to achieve within the classroom or time-frame of instruction. Simulations can be as simple as a basic animation shown over the projector by the instructor, as sophisticated as students navigating a 3-D virtual environment on individual computers.
  - Similar to the traditional functions of an overhead projector, document cameras enable the instructor to project onto a larger screen a variety of documents or objects. The document camera does not require transparent paper in order to project the document.
  - Audience response systems may be used to regularly engage participants, assess learning and collect data. Software and equipment typically work with Microsoft PowerPoint or other presentation software that allows responses via a keypad or other handheld or computer devices.
  - Free-standing foldout posters or wall posters may be used to communicate concepts that enhance the regular instruction and reinforce concepts taught within the regular curriculum. Posters may be created within the classroom setting as an engagement strategy.

7. Standards for Reference Manual

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 or a manual of instruction, and participants use the material therein to solve problems or gain additional information.

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

8. Standards for End-of-Course Assessment Tools

To ensure the integrity of the test, the contract may require development of two separate tests. In any case, the instrument(s), answer key(s), and affiliated documents must be delivered to NHI in accordance with delivery specifications for electronic and hard copy submissions.

8.1. Traditional Test Methods

Assessment instruments could include objective measures (such as multiple choice questions, matching questions), skill demonstrations, and critical thinking (case studies).

Various types of test items may be used and are described below.

Test Item Type	Characteristics
Multiple-choice	• Useful for testing knowledge and cognitive abilities • Consists of a stem and a selection of possible responses (Answer scan sheets accept up to five possible responses)
Matching	• Useful for testing terms and labels • Consists of two columns of related words, phrases, or symbols to be matched by the student
True or false	• Useful for testing knowledge • Consists of a single statement Note: Use no more than 10% true or false questions
Completion or “fill in the blank”	• Useful for testing recall of knowledge committed to memory • Consists of a statement from which a word(s) or short phrase has been omitted. The student must supply the missing word(s) or phrase in the blank(s) provided
Performance	• Useful for testing job tasks and skills • Consists of a simulated or actual environment with certain conditions of performance and certain expected outcomes

8.2. Rubrics

More subjective formats, such as case studies and those used for certain performance test items, must include clearly stated response criteria or parameters to reduce subjectivity when evaluating participant responses.

One recommended approach to mitigating subjectivity is the rubric. A rubric can be created in list format or in grid, or matrix, style. A rubric typically contains these elements:

- Performance standard reflecting
  - 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)
  - Criteria for success or mastery
- Descriptors or performance characteristics that indicate the level of performance.
- Indicators for each level, providing example answers or clues that indicate a level of performance.

For more information, see:

Andrade, Heidi. “The Trouble with a Narrow View of Rubrics.” *The English Journal*, 95.6 (July 2006): 9.

Andrade, Heidi. “Teaching with Rubrics: The Good, The Bad, and The Ugly.” *College Teaching*, 53(1), 27-32.

Andrade, Heidi. “Using Rubrics to Promote Thinking and Learning.” *Educational Leadership*, 57(5), 13-18.

Andrade, Heidi. “Understanding Rubrics.” *Educational Leadership*, 54(4), 14-17.

Marcus, Jane. “Data on the Impact of Alternative Assessment on Students.” *The Education Cooperative.* Unpublished manuscript. Wellesley, MA. 1995

Marzano, Robert, Debra Pickering, and Jay McTighe. “Assessing Student Outcomes: Performance Assessment Using the Dimensions of Learning Model.” *ASCD.* Alexandria, VA. 1993

Perkins, David, and others. *Thinking Connections: Learning to Think and Thinking to Learn*. Reading, MA: Addison-Wesley, 1994

San Diego State University. “Rubric Template” San Diego State University, http://edweb.sdsu.edu/triton/july/rubrics/rubric_template.html.

Kent State University. “Using Rubrics” Kent State University, http://literacy.kent.edu/Oasis/Pubs/0300-27.pdf.

9. Standards for Exercises

For each lesson, the most suitable types of learning opportunity are required to validate the participant's understanding of the course material. Exercises, calculations, skill practice, and other experiential work provides an opportunity for the instructor and the participant to assess comprehension and relate the training content to work-related scenarios.

Include a copy of all case studies, exercises, problems, and simulations in both the instructor guide and the participant workbook.

- Provide complete background information in the IG for all exercises.
- Include directions, outcomes, answers (suggested responses and terminal answers), and debriefing information.

10. Standards for Handouts

Handouts include any additional material used by the instructor that is given to participants during class. Handouts may be appropriate for plans or other graphical elements that require large-size paper.

- Examples include exercises and skill practice, workshop information, problems and calculations (with solutions), an explanation of roles for group projects, case studies, or other supplementary information.
- Use handouts sparingly; as a general practice, include all documents in the PW.

11. Instructor Checklist for Delivery

Request for Training

Hosts ca request training by completing a host request form online at the NHI Web site https://www.nhi.fhwa.dot.gov/training/intro_hosting.aspx. Once notice is received from NHI that a session has been requested, contact the designated individual within 10 days to verify the session date.

After receiving the session confirmation notice by email, the instructor should follow these tips to ensure proper record keeping.

- If you are not listed in the NHI system as the main point of contact for the course, be sure that individual forwards you the session confirmation email. It contains important information such as the course number and session number.

- Be sure that you are registered with NHI as an instructor and that you have your four-digit instructor code. You may register on the NHI Web site or contact the NHI Instructor Liaison by calling (703) 235-0500.

Course Instruction and Content

Work with the Local Host/Coordinator to set the start and end times for the session. Ask for any local examples or concerns that will help you provide relevant examples for the local environment. Also confirm the training dates, location, and number of participants **(30 maximum participants).**

Ask the Local Host/Coordinator for any equipment or room set up that you need. Typical items might include;

- DVD player
- LCD Projector compatible with a notebook computer (e.g. InFocus Projector)
- Cable necessary to connect projector to computer, if possible
- Spare projector bulb, if possible
- Projection screen
- Electronic remote device to advance slides in PowerPoint presentation, if available

- Lectern or instructor table
- Whiteboard with dry-erase pens and eraser
- Flip charts, large markers, and masking tape

About two weeks before the session, the instructor(s) should contact the host representative.

- Print and ship all course materials to the training location.
- Discuss pre-training requirements, such as surveys or State specifications that the instructor will use to customize the training experience.
- Explain training room requirements.
- Provide an executive summary and agenda for the course.
- During pre-pilot arrangements, ask the host agency if any disabled persons will be among the course participants.
  - If the answer is in the affirmative, the host agency will provide any special accommodations that may be necessary, and the contractor will be expected to conduct the presentation in a manner supportive of those accommodations. However, the host agency is responsible for making sure the learners environment meets 504 compliance.

One week before the session:

- Review the NHI Web site and check for ILT contractor/instructor resources and updates. (www.nhi.fhwa.dot.gov)

On the day before the session, instructor should:

- Locate and visit the facility to ensure proper room set up, equipment condition and compatibility, and facility logistics.
  - Verify that all course materials have arrived.
  - Become familiar with housekeeping items, such as emergency procedures and exits, lunch recommendations, restroom and snack areas, quiet zones for telephone calls, and so forth.
- Review the administrative packet and instructions for completing the participant registration forms and course evaluation forms.

On the day of the session, instructor is expected to:

- Transport all contractor-furnished instructional material and training aids to the session location.
- Arrive early, at least one hour, to ensure proper room set up, equipment condition and compatibility, and facility logistics (if not done the day before).

- Verify that all course materials have arrived.
- Become familiar with housekeeping items, such as emergency procedures and exits, lunch recommendations, restroom and snack areas, quiet zones for telephone calls, and so forth.

▪ Provide instructions to participants on how to properly complete all forms.

- Because these are scan forms, improperly completed forms will not provide accurate information to the NHI database.

▪ Provide instructor codes and the NHI session number and course title to participants.

- As a best practice, write the course and NHI session number, instructor codes, and other information for completing the evaluation forms on a flip chart or white board for participants' reference.

▪ Use the NHI roster sign-in sheets to record attendance during the morning and afternoon.

Ensure that all participants sign their name and record their employer on the first day of a session, and initial their attendance each successive half day.

- Fill in all the information requested on the front page of the roster, including NHI course and session numbers, title, dates, location, instructors, and the "Summary of Participants" section.

▪ Ensure that all participants complete the NHI participant registration forms.

- Because the forms are scanned, original forms must be completed by each participant. Copies of the form are not acceptable.

▪ Administer, proctor, and grade the end-of -course assessment, if applicable.

- In Pennsylvania sessions, administer, proctor, and grade the "Pennsylvania End-of-Course Assessment" to Pennsylvania employees. This task is in addition to standard NHI requirements.
- After the allotted time, collect the assessment to maintain security.
- Instructors collect and score participant answer sheets for objective assessments.
- If the assessment tool is designed as a case study, instructors must verify that each participant was fully engaged and able to achieve application-level learning.

▪ Complete the instructor portion at the bottom of each participant registration form for each participant.

- Sign the NHI Certificates of Training. (Print or otherwise assist with preparing these if the local coordinator is unable to do so.)
- Provide copies of completed NHI roster and course evaluation forms to the local coordinator, if requested.
- Review the NHI course evaluation and participant registration forms for completeness.

Within 10 working days after the session, the instructor is responsible for returning the following items to NHI.

- Session roster
- Sign-in sheet
- Final tests or exams
- Original NHI registration form
- Original course evaluation forms

Invoices will not be paid until the completed package is received by NHI and deemed complete. If not filled out correctly, the materials will be returned to the instructor for remediation.

12. Delivery Formats

Deliverables for ILT courses often include paper documents and other supporting materials. Deliver the products required by the contract as final deliverables in the following formats.

- One hard copy, complete in every detail.
  - 3-ring binder or comb-bound, cover, spine, tabs, and contents and appendices
  - Instructor guide
  - Participant workbook
  - Reference manual
  - Other materials requiring printing or binding
- CD-ROM or DVD in PDF format marked with “PDF” on the CD label
  - Instructor guide (provided print-ready as one complete document)
  - Participant workbook (provided print-ready as one complete document)
  - Reference manual (provided print-ready as one complete document)
  - Other materials required for course delivery
- CD-ROM or DVD in Microsoft Word 2007 marked with “Word” on the CD label
  - Instructor guide (may be segmented by module or lesson if files are large)
  - Participant workbook (may be segmented by module or lesson if files are large)
  - Reference manual (may be segmented by module or lesson if files are large)
  - Other materials required for course delivery
- CD-ROM or DVD of presentation in Microsoft PowerPoint 2007 (may be segmented by module or lesson if files are large)
- Copies of all copyright releases and letters granting permission for use from the authors or artist, if applicable
- Any written approvals for modifications

12.1. Required Details

Format the cover page and spine of the instructor guide, participant workbook, reference manual, as well as CD-ROM and DVD labels, to include all the information detailed in the sections below.

12.2. Cover Page

- A cover page is provided to the contractor as a modifiable PDF template.
- The publication number specific to each course deliverable is provided to the contractor by the NHI Training Program Manager (TPM) or Instructional Systems Designer (ISD).

12.3. Spine

- NHI logo
- Publication number
- Date (month and year)
- NHI course number
- NHI course title
- Type of document such as instructor guide, participant workbook, reference manual
- IACET logo (if applicable)
- Items listed above not applicable for comb-bound products

12.4. CD-ROM and DVD Labels

- NHI logo
- Publication number
- Date (month and year)
- NHI course number
- NHI course title
- Type of document such as instructor guide, participant workbook, reference manual
- IACET logo (if applicable)

12.5. Use of Logos and Company References

- Company logos will not be included on any deliverable to NHI.
- References to the company and or persons developing, designing, and or delivering the course will not be included in any PW, IG, RM, or visual aids.
    - Exceptions must be documented on Technical Report Documentation Page and can be inserted into the IG and or PW at front). This document can be found on the NHI Web site under the Instructor-Led Developer Toolkit.

13. Standards for Electronic File Submissions

The US Department of Transportation (DOT) Standard indicates that all printed materials, including visual aids, must be developed in Microsoft Word 2007 and PowerPoint 2007 (or newer) format. This requirement allows NHI to edit all documents delivered by the contractor.

- Note that NHI currently accepts Microsoft Office 2007 version only.
- Documents should not be delivered in read only, presentation only, or password- protected format.
- The use of macros and other complex formatting should be kept to a minimum.

Use the requirements below to create folders for files delivered to NHI.

13.1. Source Files Folder

- Instructor guide
- Participant workbook
- Presentation materials
- Reference manual
- Supplemental materials
- End-of-course exam/tests and answer keys

13.2. PDF Files folder

- Instructor guide
- Participant workbook
- Presentation materials
- Reference Manual
- Supplemental materials
- End-of-course exam/tests and answer keys

13.3. Readme File

- Create a readme file to document any materials shared with another course.
- Additional information on use of materials or printing requirements is included in this file, as well.

13.4. File Naming Convention

Following are file naming conventions for each deliverable. Separate each item in the file name with an underscore (_).

- Course number
- Publication type
  - IG (instructor guide)
  - PW (participant workbook)
  - RM (reference manual)
  - PP (PowerPoint presentation)
  - EX (exam, test, assessment, evaluation instrument, answer key)
  - SM (simulation)
  - VD (video)
  - AU (audio)
  - BK (book)
  - OM (other materials)
- Publication number (provided by NHI TPM or ISD)
- Revision date formatted with month and two-digit year
  - 0409 (April 2009)
  - 1210 (December 2010)

Following are three examples of file names using the convention:

Course Number_Type_ Pub Number_Month/Year

- 130053_IG_11-030_0411
- 130053_PW_11-031_0411
- 130053_EX_11-032_0411

References

References

Gagne, Robert, and Marcy P. Driscoll. *Essentials of Learning for Instruction*, 2nd ed. Boston: Allyn & Bacon, 1998.

Kirkpatrick, Donald, and James Kirkpatrick. *Evaluating Training Programs: The Four* L *Levels,* 3rd ed. San Francisco: Berrett-Koehler, 2006.

Knowles, Malcolm. S., Elwood F. Holton, III, and Richard A. Swinson*. The Adult Learner: The Definitive Classic in Adult Education and Human Resource Development*. 6th ed. Burlington, MA: Elsevier Butterworth-Heinemann, 2005.