COMPUTER-BASED EXAMINER TRAINING AND CERTIFICATION PROGRAM (WEB-BASED SAFETY INSPECTOR TRAINING AND CERTIFICATION PROGRAM)

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16. Abstract

State motor carrier compliance officers, also referred to as safety inspectors, face expanded job duties at a time when there is a critical shortage of qualified and trained personnel. Safety inspectors must not only understand the extensive federal regulations set forth by the Federal Motor Carrier Safety Administration (FMCSA), but must apply that knowledge using the North American Standard Out-of-Service criteria during a vehicle inspection, and know when a myriad of exceptions to the regulations occur based on the type of vehicle being inspected.

Additionally, safety inspectors must constantly adapt to the ever-changing regulations due to interpretations by court rulings, as well as new security and anti-terrorism laws passed by the federal government since 9/11. Furthermore, safety inspectors must spend time training and sharing their knowledge and experiences to newcomers in the field. In order to enhance this training, the Florida Department of Transportation (FDOT) funded a research program to be completed by University of Central Florida's (UCF) Institute for Simulation and Training (IST), and sponsored by the Florida Motor Carrier Compliance Office (FMCCO). UCF/IST is designing an innovative program to assist the training and recertification of novice and experienced safety inspectors, as well as federal agents.

During the 2008-2010 reporting period, IST completed the operational phase of the web-based Safety Inspector Training and Certification Program which teaches safety inspectors how to learn and apply the Federal regulations, exceptions, and out-of-service criteria during a Level I Commercial Motor Vehicle Inspection. The program is designed to be used as a supplement to the current safety inspector training program, with the goal of lowering course failure rate and improving on-the-job performance. In addition to the web-based lessons that were developed, the IST team developed an implementation plan, as well as a strategy to improve the training academy and Field Training Officer (FTO) program. Finally, the IST team developed a maintenance/sustainability plan for all of the web-based lessons to ensure that the program remains valid and up-to-date.

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Executive Summary

The problems addressed with this research concern the shortage and dynamic nature of requirements of state motor carrier compliance officers, also referred to as safety inspectors. This is critical because the job duties of these officers have expanded at a time when the agency is experiencing an extreme shortage of qualified and trained personnel.

The training for these inspectors involves traditional teaching methods that demand a thorough understanding of the extensive federal regulations set forth by the Federal Motor Carrier Safety Administration (FMCSA). In addition to learning numerous complicated regulations written in technical and legal language, safety inspectors must apply that knowledge using the North American Standard Out-of-Service criteria during a vehicle inspection, and they must know when exceptions to the regulations occur. Regulations, out-of-service criteria, and exceptions change based on the type of vehicle they are inspecting. This current training approach is experiencing an unacceptable failure rate of over 25% based on information provided by the Florida Motor Carrier Compliance Office (FMCCO) training academy.

Training also requires safety inspectors to adapt constantly to changes in the regulations. Regulations change due to interpretations by court rulings or new laws. For example, today's safety inspectors must be aware of new laws passed by the federal government since the 9/11 disaster that deal with security and anti-terrorism. Furthermore, training requires experienced safety inspectors to share their knowledge and experiences with newcomers in the field. The job performance of a safety inspector includes extensive and complex knowledge and skills, yet, up until recently, the training system was not fully preparing inspectors for success. Whereas the job performance was focused primarily on the technical inspections and the application of out-of-service criteria, the training was focused primarily on knowing the content in the federal regulations.

In order to enhance this training so that safety inspectors learned how to apply regulations during vehicle inspections, the Florida Department of Transportation (FDOT) Research Office funded a research program with the University of Central Florida's (UCF) Center for Advanced Transportation Simulation Systems (CATSS) and the Institute for Simulation and Training (IST). This program is sponsored by the Florida Motor Carrier Compliance Office (FMCCO). A study team at UCF was formed to design an innovative program to supplement the training and recertification of novice and experienced safety inspectors, as well as those not involved in the everyday safety inspection process.

The new training program has these objectives:

- Preparing safety inspectors, both novice and experienced, to perform safety inspections thoroughly so that all are safer on our roads
- Minimizing failure rates of students by providing supplemental individualized training on topics or skills for which they show weaknesses, while offering the opportunity for additional practice in applying skills

- Making both the Part A and Part B class, as well as the Field Training Officer (FTO) program more effective and learner oriented
- Building a system that not only trains but provides job aids to all personnel involved in the inspection process
- Building a system that is robust, engaging, easy to use, maintainable, and can track student progress

The Safety Inspector Training and Certification Program has gone through two phases, the prototype phase and the operational phase, both of which provided qualitative and quantitative statistics to validate the program and the process used to develop it. As with all research, many interesting findings and trends were discovered. However, several confounds affected the statistical documentation due to some issues with subject matter expert (SME) feedback and structural support for the program from the time the Part A and Part B classes began, all the way through to the FTO program. However, even with the statistical confounds, SMEs and sponsors believe that the program has greatly improved and enhanced the training and recertification of safety inspectors and field training officers, particularly during the more recent operational phase.

Benefits from this new training system include providing a simulation of an inspection that allows trainees to study commercial motor vehicle mechanical parts while practicing inspections before they train in the field. With practice scenarios, quick reference aids, simulated walk-around inspections, and thoughtful questions in an online web environment, students are experiencing learning that enhances the traditional teaching methods that typically occur during the Part A and Part B classes. Additionally, changes that enhance adult learning have been made to the 14-week Field Training Officer program from both the student and instructor/supervisor ends.

The reaction and formal feedback from representatives of the FMCCO community are positive, supportive, and enthusiastic about the opportunity this program provides. CATSS and IST hope that other state and federal government agencies will adopt this blended learning intervention. With the increased amount of traffic on the roads, as well as potential terrorist threats involving commercial motor vehicles (CMVs), safety inspectors must identify potential safety hazards in an accurate and efficient manner. An effective web-based training (WBT) program along with effective in-the-field job aids will greatly improve inspectors' abilities to conduct timely and accurate inspections. Additionally, higher ranked officers along with federal agents (who do not conduct weekly inspections) will have the opportunity to keep up with the latest regulatory changes and inspection procedures without having to leave their offices. Finally, improving instructor and supervisor skills on adult learning intervention provides an optimal learning environment.

* In collaboration with the program manager of this project, the title of the project was changed to reflect the technical currency and the actual title of our audience (e.g. Safety Inspectors, not Examiners).

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Chapter One: Introduction

Background

State motor carrier compliance officers, also referred to as safety inspectors, must not only understand the extensive federal regulations set forth by the Federal Motor Carrier Safety Administration (FMCSA), but they must be able to apply that knowledge using the North American Standard Out-of-Service criteria during a vehicle inspection. In addition, they must recognize that each type of vehicle they inspect could fall under exceptions to the regulations and therefore not be subject to the criteria.

Safety inspectors are also required to adapt to regulations that change due to interpretations by court rulings, policy changes from government agencies, Congress, new technologies, as well as new security and anti-terrorism laws passed by the federal government since 9/11. Furthermore, safety inspectors must spend time training and sharing their knowledge and experiences to newcomers in the field at a time when there is a shortage of inspectors. These issues require innovative, performance-oriented training methods.

Currently in Florida, candidate safety inspectors attend the Motor Carrier Compliance Officer academy, located in Havana, Florida, for training in policy and procedures, defensive driving, firearms qualifications, ethics and professionalism, defense tactics, etc. At the beginning of the study, included in the academy were two weeks of training on the federal regulations and North American Standards Inspection procedures associated with both the driver and the vehicle:

- Part A—focuses on regulations associated with the driver
- Part B—focuses on regulations associated with the vehicle

Upon completion of Part A and B, students continue their academy training before being transferred to their divisional field office to complete the 14-week Field Training Officer (FTO) program. The traditional training program had a failure rate so high that the Florida Motor Carrier Compliance Office (FMCCO) deemed it unacceptable. A list of the causes that may have contributed to the high failure rate includes:

- classes being knowledge-based rather than performance-based
- out-of-state instructors not accounting for individual backgrounds and differences between the candidate safety inspectors
- lack of performance-based job aids
- long gap between the time safety inspectors complete Part A and Part B before beginning their 14-week FTO program
- lack of use of adult learning theory practices during the FTO program
- differences in how state divisions, as well as individual field training officers, train and evaluate candidate safety inspectors

These performance problems, as well as the Institute for Simulation and Training's success in developing training for other aspects of the transportation industry, are what initiated the contact between FMCCO and the Institute for Simulation and Training (IST).

In response to these issues, Florida Department of Transportation (FDOT) decided to pursue different training techniques. Based on research activities at the University of Central Florida's (UCF) Institute for Simulation and Training (IST), FDOT funded a research program between the Center for Advanced Transportation Simulation Systems (CATSS), IST, and the sponsor FMCCO, to design and develop a computer-based safety inspector training and certification program.

Research commenced with determining what the actual job requires and with selecting the training methods to use based on the audience and the job environment. Training needed to consider adult learner styles and it needed to include advanced learning technology techniques appropriate for the law enforcement commercial motor vehicle (CMV) community. The findings of the research led to an initiative to build web-based safety inspector training with virtual vehicle inspection scenarios that could be used as a supplement to academy training, during the FTO program, and while on the job as job aids using issued laptops within their patrol cars.

Hypothesis

The UCF and FMCCO team hypothesized that a web-based or computer-based training program focused on application of inspection procedures would minimize the failure rate among novice safety inspectors, and improve on-the-job performance. It would also be a time- and cost-effective method for recertifying experienced safety inspectors as well as higher-ranked officers and federal agents.

Objectives

The objectives of this program include:

- Preparing safety inspectors, both novice and experienced, to perform safety inspections thoroughly so our roads are safer for the motoring public
- Minimizing failure rate of students by providing them with supplemental individualized training on topics or skills in which they show weaknesses, while offering the opportunity for additional practice
- Making both the Part A and Part B class, as well as the Field Training Officer (FTO) program more effective and learner oriented
- Building a system that not only trains but provides job aids to all personnel involved in the inspection process
- Building a system that is robust, engaging, easy to use, maintainable, and able to track student progress

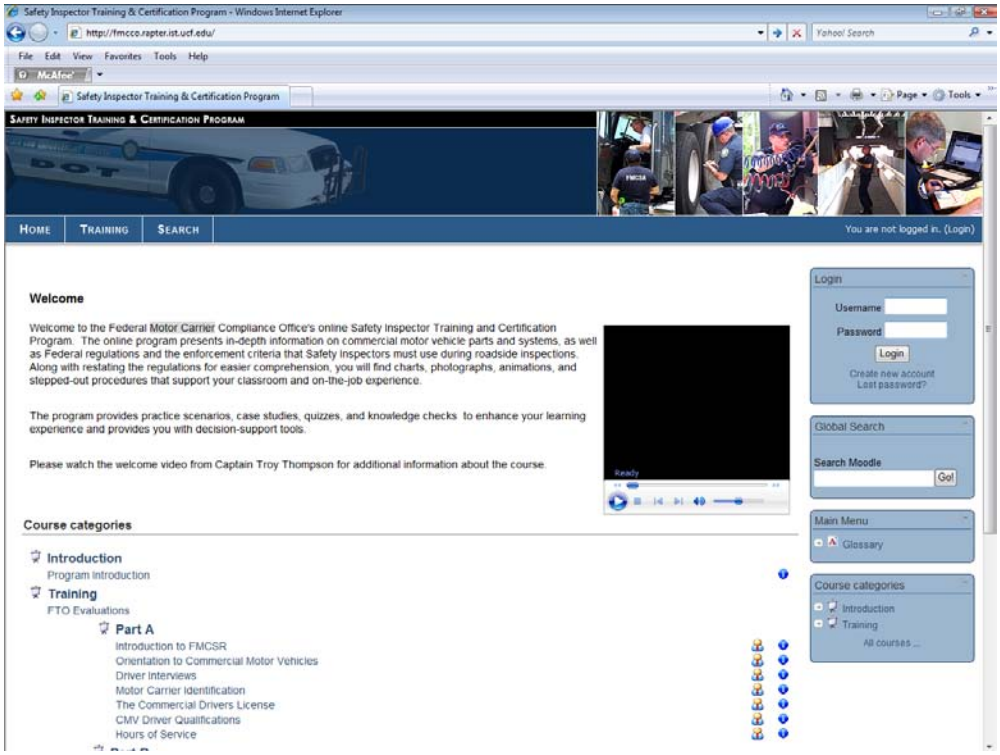
Prototype and Operational Phases

Based on the analysis of the performance requirements of FMCCO, the UCF team designed a prototype application to determine how effectively a web-based training program would work to help improve new safety inspector performance. The prototype was developed in straight HTML code to demonstrate content and interactive capabilities to sponsors and to collect both qualitative and quantitative data on the effectiveness of the new training. Due to the success of the prototype (discussed in the Interim Final Report in 2008), FMCCO funded development of an operational version, "Web-based Safety

Inspector Training and Certification Program." The operational version was capable of presenting the prototype curriculum in an internet-learning environment with the additional functionalities that the prototype did not provide, such as student registration, tracking, recording of quiz responses, and other necessary administrative requirements (see section below in *Learning Management System*).

Prototype

Operational Version



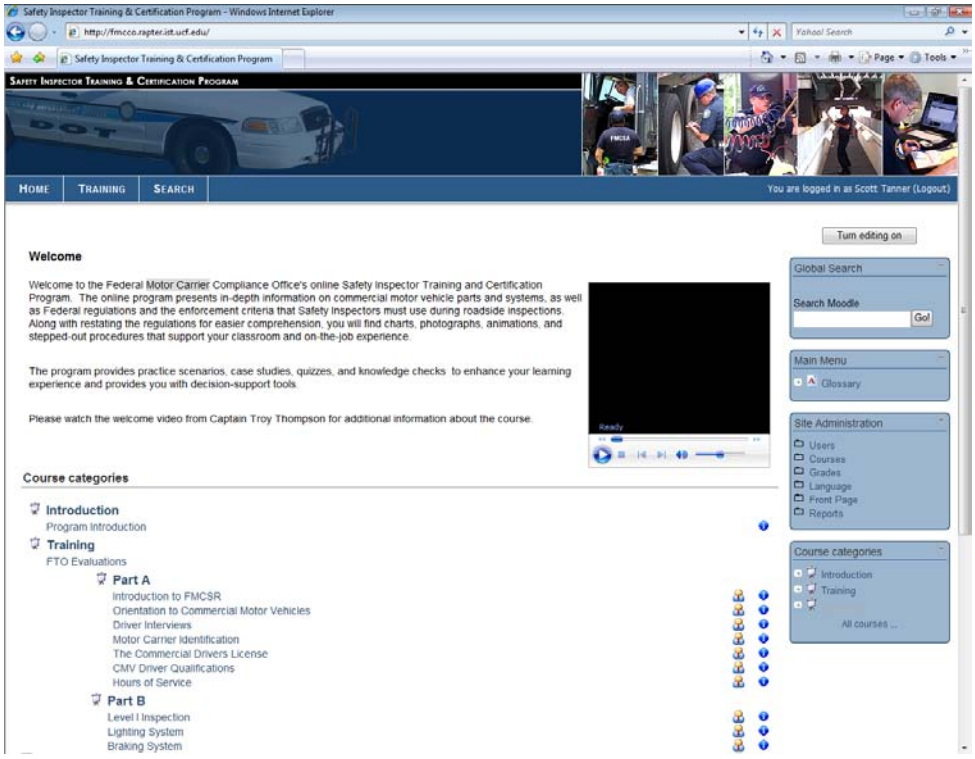
Program Structure

In previous training classes, instructors lectured and inspectors sifted through pages of regulations and out-of-service criteria. In many cases, inspectors had to use multiple resources simultaneously to try to figure out whether a CMV was in compliance. Because safety inspectors are required to inspect vehicles and the regulations are difficult to read and learn, the UCF team took a different approach in creating the new training. The UCF team organized the training program based on the inspection procedure and the mechanical systems and parts of the CMV, rather than the regulations. This organization better lends itself to training and on-the-job performance because it better simulates the true demands of the job.

The new operational program is broken down in the following manner:

I. Home Page with Introductory Video
II. Diagnostic Test
III. Training
    a. Introduction
    b. FTO Evaluations
    c. Part A
    d. Part B
IV. Scenarios
V. Search (reference Library)

Home Page



The home page consists of an introductory video and a breakdown of the training sections. It allows users to go directly to the training section or directly to the specific lessons or sections they desire. It also allows instant access to a search or reference library so users can get instant access to a particular topic or regulation, without having to search through the training lessons.

Diagnostic Test

IST designed the diagnostic test to allow experienced safety inspectors, FMCSA agents, and those in upper management positions to diagnose their own strengths and weaknesses. In diagnosing their strengths and weaknesses, users can tailor the training they may need, rather than going through the entire program.

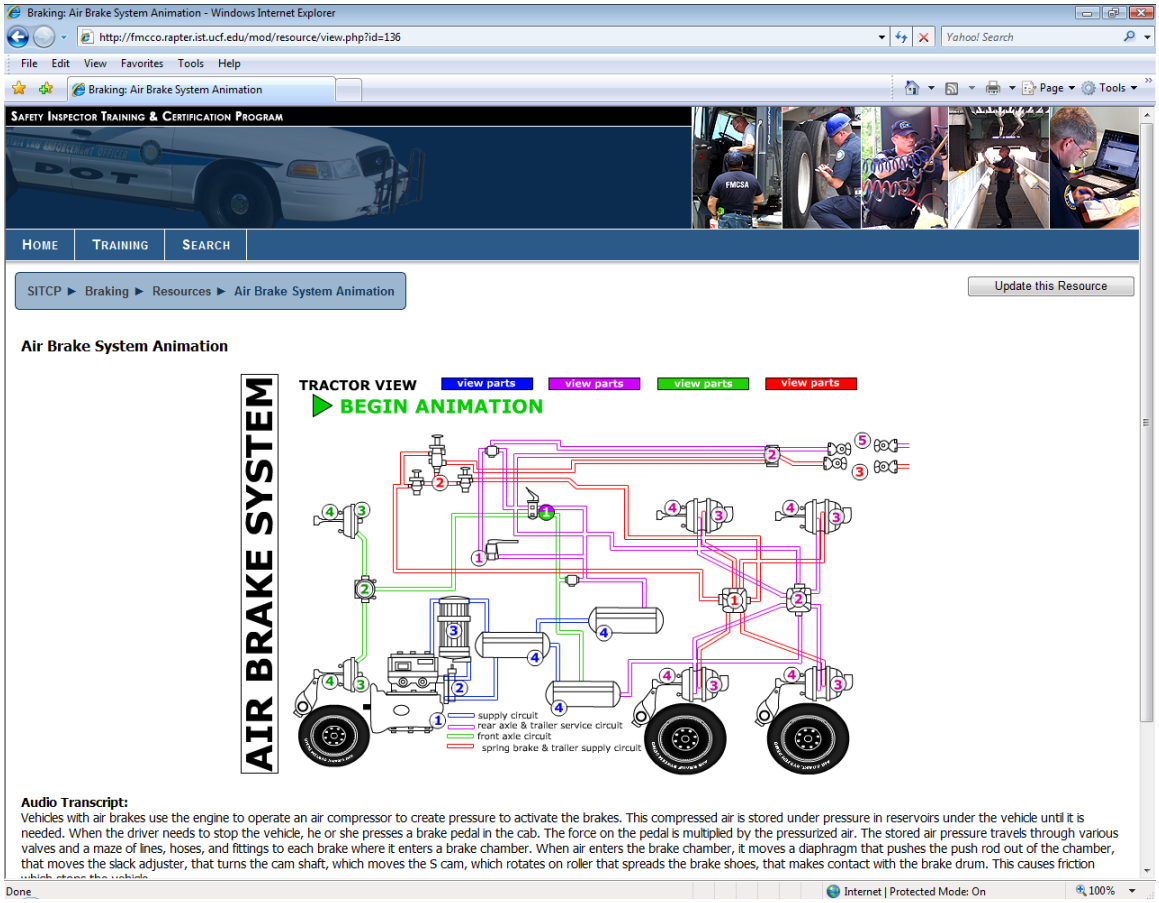
Training

The beginning part of the training section consists of a course introduction that provides information on how to navigate through the course, as well as how to use course icons. Additionally, it consists of general information on FMCSA's and CVSA's role in inspections, and introduces the Level I inspection. Because the program allows access to individual lessons and sections, safety inspectors with various experience levels may choose to forgo the introduction and go straight to the section or lesson they desire. Users can access different topics from the home page as well.

Another part of the training section is the FTO Evaluations link. This link is provided to allow higher-level FTO personnel to input data on candidate safety inspectors' progress through the 14-week FTO program. Data collected in this section is not only of value to FTO sergeants and higher-level personnel, but it assisted the UCF team in determining whether the program was effective during field trials by providing statistical measures.

The course also provides thorough lessons on Part A (driver) and Part B (vehicle). Because the UCF team felt that the current organization of the federal regulations was confusing and difficult to read, the team organized the new training program differently. IST broke the training section down to mirror both Part A and Part B Federal Regulations. However, rather than just restating regulations, each section begins with an overview, followed by an explanation of vehicle parts and how the particular system works (specifically for Part B). Then, the lessons explain the regulations using simplified

text combined with interactive images, static and animated diagrams, flowcharts, video (where necessary), and *safety check* quizzes. Safety checks provide users with practice and feedback opportunities, while specialized iconic boxes were developed to highlight the North American Standard Out-of-Service criteria and regulatory guidance/exceptions. The UCF team believes that this not only improves learning but makes the program more enjoyable.



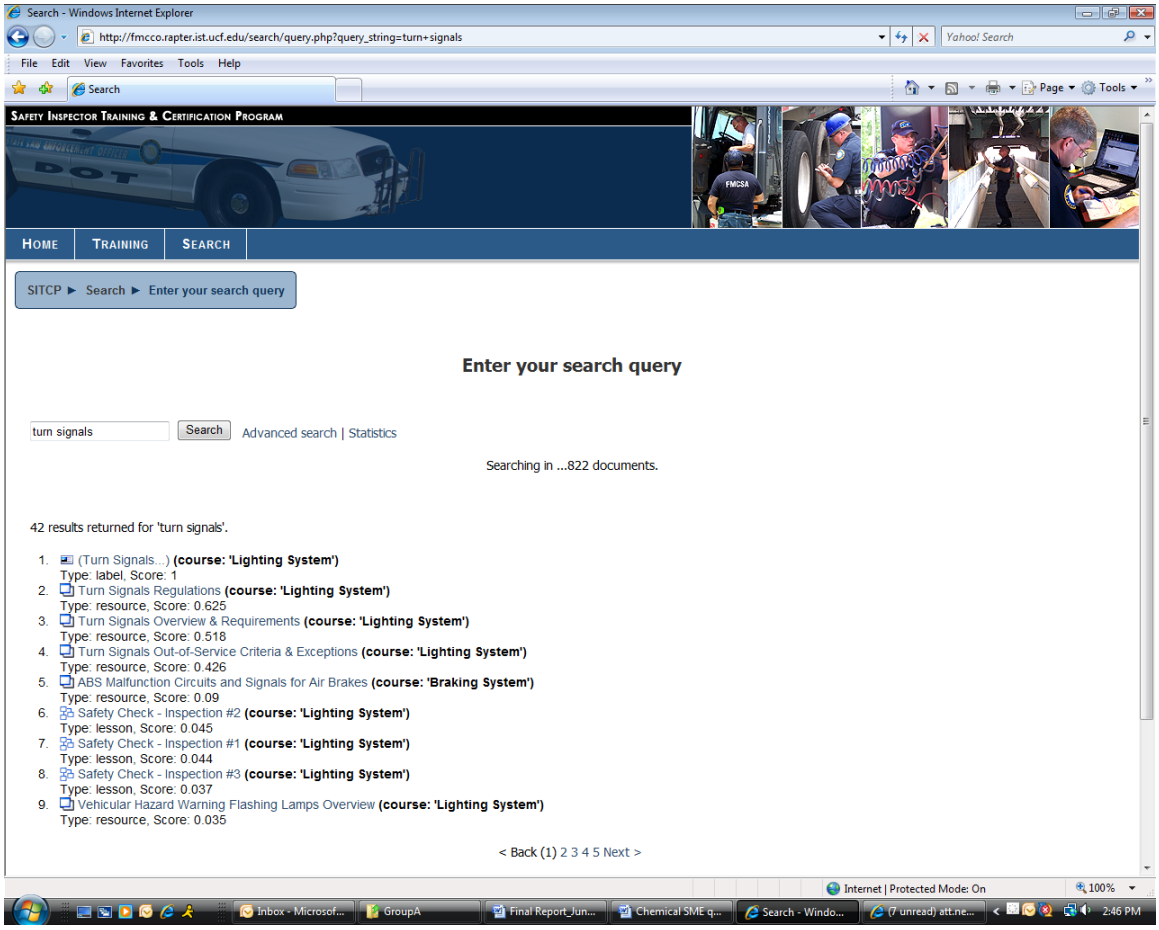
Scenarios

Upon completion of the training, users have the option to perform virtual inspection scenarios to determine whether they know how to apply the regulations and out-of-service criteria during an inspection. The UCF team believes that this is an effective way to provide additional hands on application of user knowledge without the challenge of finding a real truck to inspect. The virtual inspection scenarios will better prepare inspectors for what they might experience in the FTO program and on the job. Results and feedback are provided immediately and in a detailed fashion to safety inspectors to identify their particular strengths and weaknesses, allowing them immediate remediation.

Search/Reference Library

IST designed the program so that novice and experienced safety inspectors, as well as federal safety inspectors, can use the training materials as job aids during an inspection.

This will help inspectors complete inspections more quickly and more accurately because they will not have to sift through books of regulations. Inspectors can use a search engine, type in key words, and immediately find the information they need during an inspection.



Chapter Two: Research Review

Leveraging the Virtual Check Ride System (VCRS) to Safety Inspector Training
In 2003, the UCF/IST team attended a conference in Sarasota, Florida with the intention of displaying the Virtual Check Ride System (VCRS), (another research project conducted by UCF). During the conference, Lt. Col. Binder of the Florida Department of Transportation Motor Carrier Compliance Office approached the team. Lt. Col. Binder expressed interest in the Walk-Around Inspection portion of the VCRS and in how to redesign it for safety inspectors rather than the traditional CMV driver. By reviewing previous research on vehicle inspection training conducted by Commercial Vehicle Safety Alliance (CVSA), Transportation Review Board and research done for the VCRS, the UCF/IST team gained a better understanding about how to apply the VCRS vehicle inspection to safety inspector training.

IST developed the VCRS (a computer-based/web-based training system) to train and recertify CMV drivers. The VCRS allows CMV drivers to demonstrate that they possess the knowledge and skills required to operate a commercial motor vehicle successfully and safely. Because VCRS is a computer simulation, it allows drivers to take a virtual alternative to the actual state-conducted, federally-mandated Commercial Driver's License (CDL) test from the comfort and safety of a computer and simulator lab. The test requires students to complete a multiple-choice state-mandated CDL knowledge test, a virtual vehicle walk-around inspection, and a simulator-based road skills test, all while receiving immediate performance feedback (Allen and Tarr, 2003).

FMCCO saw an opportunity to leverage the virtual walk-around portion of the VCRS and use it to train and recertify safety inspectors to prepare them for conducting a Level 1 Inspection using the federal regulations and North American Standard Out-of-Service criteria. Based on information provided by the FMCCO training academy, preparing students using the current traditional classroom-based lecture was not effective due to the 25% failure rate, . Neither was eliminating the Part A and B courses. Jointly, FMCCO and UCF decided that testing a web-based training program in conjunction with the Part A and B courses and in conjunction with field training, would help enhance students' learning experiences and their on-the-job performance.

Traditional CVSA Safety Inspector Training Courses
Additionally, the IST team researched the World Wide Web to see if there were other web-based training applications for the training and certification of safety inspectors. Not finding any, the IST team decided to create something unique and innovative.

IST decided to leverage the methods and strategies of the Virtual Check Ride System Research into the new course. Research on the Virtual Check Ride System had shown that complex skills can be taught via the World Wide Web and by means of simulation. The current VCRS Walk-around Inspection was studied and deemed too difficult for truck drivers to complete due to its complex nature. By creating an offshoot of the Virtual Walk-Around Inspection, and gearing it toward Safety Inspectors (Level I Inspection), a complex set of knowledge and skills could be taught in a more cost-effective manner and

could offer more opportunity for practice and feedback than is currently being done (Allen and Tarr, 2003).

To create the Computer-based Safety Inspector Training and Certification Program, IST studied the safety inspector training courses set forth by CVSA, attended classes, and researched innovative methods used to train truck drivers through the VCRS. The Computer-based Safety Inspector Training and Certification Program combined the lessons learned from the VCRS training with the teaching provided through the traditional classroom-based courses taught by CVSA. This analysis helped to create an innovative method to train safety inspectors so that they could apply the Federal Regulations and North American Standard Out-of-Service criteria during a virtual Level I inspection of a commercial motor vehicle.

Chapter Three: Methodology

Safety Inspector Training Learning Management System

Once the UCF team successfully tested the HTML prototype of the Safety Inspector Training and Certification Program by using it in field trials, it was time to move to a database-driven system. Using a database met many goals and enhanced the capability of the program because it offered the ability to track student usage, robust search capabilities, and easy-to-use administration capabilities. In addition, to update the HTML prototype required a combination of content editors, graphic designers, and specialized programming staff. It was important to simplify this process, giving the instructional designers and course instructors' direct access to make any necessary updates to the content. Moving to a database-driven system frees the programming staff to work on specialized issues regarding design and implementation of new features.

Considering the budget, available resources, and timeline, the UCF Team had to decide whether to develop the system in-house or to use a developed system. Research and discussion ensued while the UCF team reviewed content management systems (CMS), learning management systems (LMS), and virtual learning environments (VLE). Though it might limit the number of customizations available for the program, using a pre-existing system would cut down on the time needed to get the system implemented and functional.

With that decision made, the next step was to determine which type of system would work best. There were aspects of the prototype that functioned as a traditional website so the UCF team considered both content management systems as well as learning management systems.

CMS versus LMS: A CMS can be used to create, edit, manage, and publish content without requiring any technical knowledge of web servers or HTML programming. A CMS is also built to present information in a consistent fashion, making it easy to conduct system-wide adjustments to the layout of information both from an organizational standpoint and from a user interface standpoint. Similarly, an LMS facilitates learning content and administration. While a CMS can handle a wide-range of content, an LMS is specifically designed for learning content and comes pre-packaged with functionality designed specifically for online courses and training (Ismail, 2002).

While a CMS would offer more flexibility in the design of the course, the UCF team ultimately decided to choose an LMS because it has built-in learner features. Most content management systems offer the ability to include additional features by adding plug-ins or modules but these are usually developed by yet another third-party company and require separate maintenance and upkeep. With an LMS, the majority of the functionality required is included in the base install. This means a faster initial set up but does sacrifice some customization (Zhang et al, 2005).

Choosing Which LMS to Use: Once the UCF team decided to use an LMS, the search began for an LMS that would allow and enhance the functionality already established as

necessary through the design work for the prototype. Factors affecting the search included determining the internal support provided by staff and the budget for the project. Another factor was that only a small number of users would be accessing the system at the same time, so there was no need for large-scale systems intended to stand up to university-level web traffic. This helped narrow the field of LMS companies to research. Finally, the UCF team began looking at companies that provide mostly open-source systems, available for small fees or free, that allow some customization to meet requirements.

The UCF team chose to focus on the three companies and created a comparison chart of all the available features for each system. This clarified the functionality to help the team choose one system over another. Using the chart also made it easier when calling each company to discuss features such as the effort required to install, implement, and maintain their product. Since a prototype was already in place, the UCF team was able to inquire about specific scenarios related to the content and the way the team needed to use the system. This prepared the UCF team for the challenges that might occur during implementation.

Using the features chart and the knowledge gained from talking to company representatives, the UCF team narrowed the selection down to three specific systems that appeared to answer most program needs. The team then spent some time using the demo versions of these three systems, importing the same content into each system to see not only how the content would look but also to test the usability of the editing interface. One of the goals was to find an interface that was not overwhelming or difficult to use for someone with little technological experience.

Through this research and testing, the UCF team discovered that one LMS best matched the requirements—Moodle (www.moodle.org). After obtaining the latest version, IT staff installed Moodle on the in-house servers and began customizing Moodle to suit the requirements. Because Moodle requires the use of themes, the team had to change and adapt the HTML prototype design to work with the parameters of the new system. This affected both the physical layout of the pages and the placement of navigational buttons and menus. However, with a theme in place, the pre-set styles would now be applied automatically allowing content editors to edit data directly without the need of an HTML programmer.

Converting to Moodle: With the new user interface in place, the UCF team began importing all of the data from the prototype into the new system. At this point, the HTML prototype was still in use at the Motor Carrier Compliance Officer academy, which meant the team was both importing data into the new system while also converting storyboards into HTML for the prototype. Once those conversions were done, the UCF team trained its staff to use the new system and the process of importing everything into the new system truly began. This included setting up a training section course, converting safety checks into quick quizzes, updating all the images to match the look of the new interface, and adjusting code for multimedia features like video and flash. The UCF team also added definitions for terms found in the courses, creating a system-wide glossary.

While completing internal reviews of the system and any related updates that were required, the UCF team enabled the guest user functionality and invited subject matter experts to begin reviewing the content. Using their feedback, necessary edits and updates were made. Once all of those changes had been implemented, it was time to prepare the system for use during the academy. the UCF team set up access for key personnel and activated the registration page for use during training.

Edits and Updates: With the system live, the UCF team continued to implement edits and updates as requested by safety inspectors reviewing the system. Email and phone support, such as assistance logging into the system and understanding navigational buttons for those safety inspectors when needed, were provided. In addition to keeping the content updated, the team kept the system up-to-date by installing the newest iterations of the Moodle software as they became available. This included keeping any additional modules updated with their newest versions as well.

FTO Evaluation Form: When FMCCO requested an online version of the FTO evaluation form, the UCF team created and tested a stand-alone form inspectors could use to enter their evaluations directly into a database. The form was then converted into a module for use within the LMS. This keeps the form inside the structure of the system enabling the ability to limit access to the form to those inspectors with specific access to the system. In the future, this could be further developed to have evaluation results available along with the other reports already provided by the system.

Future Updates: Moving forward, updates to the system will need to be applied when Moodle releases them along with updates to any additional installed modules. Moodle performs tests on its code as it updates so it will be harder to troubleshoot issues if the UCF team's code is not kept current with Moodle's updates. Moodle also releases updates when its code is exploited with new viruses and holes, yet another reason to stay aligned to ensure the site is as secure as possible.

If it is necessary to move the system to a new server, the system must be outfitted according to the requirements listed on the Moodle website to include running the appropriate version of PHP and MySQL. The database must be exported and re-imported to the new server. The code must also be copied to the new server, keeping the current themes and modules in place. Finally, the current settings within the Moodle configuration files must be updated with new server information and settings.

System Training: In anticipation of new administrators or content editors, the UCF team began working on a user guide to help with learning the system. However, there will still be some training required for each staff member required to keep the system updated to cover the basic set up and functionality of the system as well as how to access files, view reports and stats, make updates to existing courses, and add new pages or courses.

Staff Requirements: The system requires IT staff to set it up on the server as well as one administrator who will have access to the files on the server. Although the system

eliminates the need for HTML staff to keep the basic content up-to-date, content editors should have access to someone knowledgeable in HTML for special needs and to provide support for theme and user interface changes. Finally, course administrators and content editors are necessary to keep the courses and regulation information up-to-date as well as grant users access to the appropriate courses and information.

Data Collection

Control Group and Experimental Group

The UCF team used inferential statistics to validate the web-based training program in the operational phase of the contract due to small sample size. IST made comparisons between those who received the web-based training (WBT) program and those who did not receive WBT during their training. Because scores on Part A and Part B tests were not provided, IST developed a new method of measuring safety inspectors' performance. IST developed an FTO evaluation form for field training officers to use when evaluating new trainees in the FTO program. Because the pre-existing evaluation criteria were very broad and subjective, the new FTO evaluation form measured safety inspectors on very specific behaviors over 12 different categories of inspection. Evaluations were performed at the end of Phase 1, Phase 2, and Phase 3 of the FTO program.

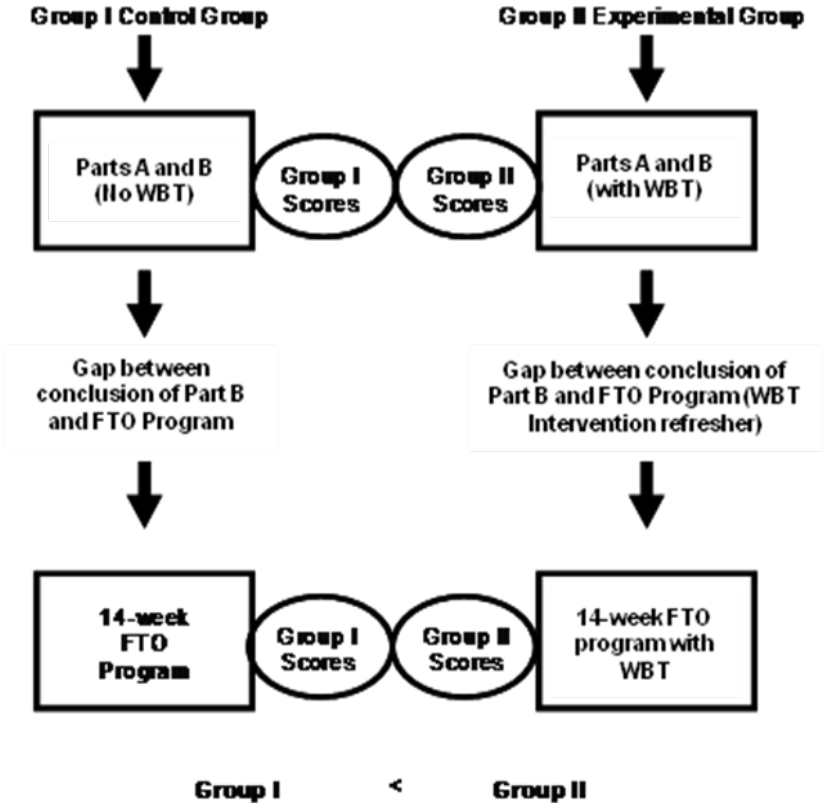
Upon completion of each evaluation, FTO evaluators emailed or faxed the results to the UCF team. The UCF team used its own set of scoring criteria (on a scale of 1 – 5) to evaluate objectively the safety inspector trainees. During the latter half of the operational program, FTO sergeants were given the ability to fill the FTO Evaluation form electronically. Using the electronic form, the UCF team did not have to score the form by hand. It was scored automatically by the learning management system. However, only one FTO Sergeant made use of the electronic form.

Group 1: Control Group. The control group consisted of year 2006-2007 candidate safety inspectors who received no WBT intervention at all. Subjects went through the standard FMCCO academy, taking the Part A and Part B class, followed by the standard written test provided by FMCSA. Upon completion of Part A and Part B, candidate safety inspectors completed the rest of the academy, graduated, then went to their respective divisions to complete the 14-week FTO program. During the 14-week FTO program, the group was assessed using the new FTO evaluation form.

Group II: Experimental Group. The experimental group consisted of 2007-2009 candidate safety inspectors who did receive the WBT intervention. These subjects went through the same process as group one, except that they received the WBT intervention during both Part A and Part B classes, the gap between Part B and the 14-week FTO program, and during the 14-week FTO program. The same FTO evaluation form was used for evaluation.

In order to get a better understanding of how each group was assessed, review the following figure (Figure 1).

Figure 1. Group I versus Group II Intervention



Chapter Four: Findings

Upon completion of the validation study, IST discovered the following results. First, the UCF team collected important demographic background information that could have an impact on the results. The two main demographics that the UCF team collected were: 1) prior commercial motor vehicle experience, and 2) prior law enforcement experience. The UCF team collected these two important demographics for the following reasons. First, the UCF team hypothesized that prior CMV experience would greatly improve safety inspectors' ability to identify the parts and systems of a CMV, thereby giving them an advantage over those who did not have CMV experience. Likewise, for those safety inspector candidates who had prior law enforcement experience, the UCF team hypothesized that it would greatly improve their ability to identify rules and regulations and take necessary enforcement action, thereby giving them an advantage over those who did not have prior law enforcement experience.

Table 1: Number of Safety Inspectors with prior CMV and Law Enforcement Experience

	CMV experience	Law Enforcement Experience
Non-WBT Students	9 (n = 21) (43%)	11 (n = 21) (52%)
WBT Students	14 (n = 35) (40%)	18 (n = 35) (51%)

Next, based on the survey responses that the candidate safety inspectors completed at the conclusion of the Part B class, the UCF team averaged the scores. The survey asked trainees to rate the web-based Safety Inspector Training and Certification Program on several different criteria on a scale of 1-5, with 1 equaling strongly disagree, and 5 equaling strongly agree. The questions were asked in a way that a score of 5 reflected positively on the program while a score of 1 reflected negatively on the program. The following averages were recorded:

Table 2: Safety Inspector Survey Average Scores

1. This program would be useful to me as an addition to the instructor led portion to the Part B class	4.7
2. The content in this program was accurate.	4.7
3. The content in this program was easy to read and understand.	4.5
4. The use of diagrams and images was helpful in understanding how to apply the regulations during an inspection.	4.7
5. The quick quizzes were useful and provided me with good feedback.	4.5
6. The reference library in this program will be useful on the job during a roadside inspection.	4.6
7. This program will be useful to me during the FTO program.	4.5
8. This program will be useful in helping me to refresh my knowledge in areas where I might be weak.	4.6
9. The inspection scenarios (test) tested me on information I need to know during an inspection.	4.5
10. The navigational features in this course such as the drop down menus make this program easy to navigate through.	4.7
11. The program provided me with the right amount of detail in each lesson.	4.5

Finally, the group of candidate safety inspectors who *did not* receive the WBT averaged 2.25 (on a 1-5 scale) upon completion of Phase 1. Meanwhile, the group of candidate safety inspectors who *did* receive the WBT averaged 4.31 (on a 1-5 scale) upon completion of Phase 1. The group of candidate safety inspectors who *did not* receive the WBT averaged 4.37 (on a 1-5 scale) upon completion of Phase 2. Meanwhile, the group of candidate safety inspectors who *did* receive the WBT averaged 4.78 (on a 1-5 scale) upon completion of Phase 2. The group of candidate safety inspectors who *did not* receive the WBT averaged 4.44 (on a 1-5 scale) upon completion of Phase 3. Meanwhile, the group of safety inspectors who *did* receive the WBT averaged 4.91 (on a 1-5 scale) upon completion of Phase 3.

Table 3: Average Scores of Safety Inspectors (Non-WBT vs. WBT) (n = sample size)

	Non-WBT	**WBT**
Phase 1	2.25 (n = 15)	4.31 (n = 35)
Phase 2	4.37 (n = 11)	4.78 (n = 35)
Phase 3	4.44 (n = 10)	4.91 (n = 35)

Additionally, in tables 4 and 5, IST stated the average scores of safety inspectors within each group. There were two groups (groups A and B) within the *no WBT* group; hence the smaller sample size. There were three groups (groups A, B, and C) within the *WBT* group, hence the larger sample size.

Table 4: Average Scores of Safety Inspectors (Non-WBT Group A vs. Group B) (n = sample size)

	Group A	**Group B**
Phase 1	2.51 (n = 7)	1.99 (n = 8)
Phase 2	4.36 (n = 7)	4.38 (n = 4)
Phase 3	4.41 (n = 7)	4.47 (n = 3)

Specific scores for each category of inspection can be found in Appendix E

Table 5: Average Scores of Safety Inspectors (WBT Group A vs. Group B vs. Group C) (n = sample size)

	Group A	**Group B**	**Group C**
Phase 1	4.17 (n = 13)	4.17 (n = 6)	4.48 (n = 16)
Phase 2	4.69 (n = 13)	4.99 (n = 6)	4.77 (n = 16)
Phase 3	4.82 (n = 13)	5.00 (n = 6)	4.94(n = 16)

Specific scores for each category of inspection can be found in Appendix F

Additional findings include feedback from safety inspector questionnaires. These findings will be reviewed and discussed in Chapter 5: Discussion. The sample questionnaire can be reviewed in Appendix E.

Based on the questionnaire responses, the UCF team recorded the following program strengths and weaknesses:

Table 6: WBT Strengths and Weaknesses

Strengths	Weaknesses
• Program is user friendly • Program has great illustrations, examples, pictures, and diagrams to help simplify concepts • The interactivity allows the student to learn better visually • Everything is on the computer, so there is less paperwork • Navigation is easy • Reference Library will be extremely useful at the roadside • The course is very interesting • Course provides an excellent source for individualized training • Course could be useful for truck driver education, helping to bridge any gaps between the safety inspectors and the drivers	• There are air card problems, especially larger flash animations • Some users did not have access or enough time to use it at the academy • There are concerns about updating regulations due to the many changes that occur throughout the year • The course is dependent on computer connectivity • The course could be more user friendly • The course needs more pictures

The UCF team believed that the most critical FTO evaluation would occur at the end of Phase I due to retention and application of knowledge after the gap between the end of Part A and Part B and the 14-week FTO program. Therefore, the UCF team further broke down the scores of candidate safety inspectors using the following criteria:

- Prior CMV knowledge
- Prior law enforcement knowledge only
- No prior CMV or law enforcement knowledge
- Both prior CMV and law enforcement knowledge

The UCF team chose to focus on the safety inspectors who had the WBT available because the Non-WBT group had a larger drop-out rate, which meant high inconsistency in the scores.

Table 7: Further Breakdown of Safety Inspector FTO Evaluation Scores for WBT Group at the End of Phase I

	CMV Experience	Law Enforcement Experience	No Experience	Both CMV and LE Experience
# (%)(n=35)	5 (14%)	9 (26%)	12 (34%)	9 (26%)
Average Score after Phase I	4.53	4.02	4.12	4.75

Chapter Five: Discussion

Iterative Formative Evaluation Discussion

During the analysis, design, and development phases of the program, subject matter experts and internal team members continually evaluated the content for accuracy and effectiveness. There have been three types of iterative formative evaluation thus far:

1. Internal review
2. Subject matter expert review
3. End-user review

During the prototype phase, internal review consisted of UCF team members designing, creating and reviewing storyboards for consistency, proper instructional strategy, and proper program design strategy. Several team members, all with different backgrounds and experiences, attempted to understand the storyboards from a new learner's perspective. Team members shared ideas based on individual strengths and weaknesses in an attempt to make the storyboards more effective as learning tools. During the operational phase, team members reviewed the learning management to ensure that it incorporated the critical aspects of the instructional design process to ensure effective content delivery.

During the prototype phase, subject matter expert review consisted of safety inspectors reviewing raw content for proper accuracy and scope. After each storyboard was reviewed internally by UCF team members, the storyboards were sent out to safety inspectors to review. Due to the complex nature of the content, subject-matter experts (SMEs) also made in-house visits to review storyboards page by page. UCF team members then incorporated the corrections and suggestions set forth by the SMEs, and then sent the storyboards out for final review before development on the World Wide Web. After converting the prototype to the LMS (operational phase), subject matter experts used review and edit forms to record any suggested changes to the content. These review and edit forms were set up as easy to use tables within a Microsoft Word document. One of the reasons SMEs had to re-review the converted Part B content was to update any changes that may have occurred due to regulatory or Out-of-Service criteria updates. Additionally, SMEs had to review all Part A content for accuracy.

End-user review took place during the Part A and Part B classes in Havana, Florida. During the prototype phase, students going through the Part B class reviewed storyboards as well as existing online content presented and made suggestions or offered ideas. Additionally, Part B students filled out a survey/questionnaire and provided feedback as to the strengths and weaknesses of the course. Unfortunately, due to the lack of web access, students had to provide feedback based on what was presented to them during class. Based on survey responses, on a scale of 1-5, the students rated various aspects of the program consistently between 4.5 and 4.7 (see Table 5: Safety Inspector Survey Average Scores). In other words, across every aspect of the program presented to them, students rated the program in a positive light and either *agreed* or *strongly agreed* as to the program's usefulness. During the operational phase, both Part A and Part B students were able to review the program, online, in its entirety. One of the UCF team's critical

initiatives required leadership at the academy to provide web access in the dorms or specific study room so that safety inspector candidates could have access to the program after hours. This was accomplished during the operational phase of the program.

Of specific note, both the students and instructor liked the idea that the regulations were re-written in a way that was less difficult to understand. Additionally, students had strong opinions about the application of the regulations through inspection scenarios, as well as the importance of breaking CMV systems down into their critical parts, rather than reading through a book of regulations and trying to memorize them. Students, as well as experienced safety inspectors, also voiced a strong need for a reference library. This concern was addressed during the operational phase using the learning management system. These opinions were voiced in the Questionnaire and Survey (Appendix E), but responses were considered private. The reference library enabled students and experienced safety inspectors to access information quickly and accurately on areas in which they were weak, and then take the correct course of action.

Experimental Design Discussion

Before the experimental design began, the UCF team expected that the safety inspector candidates who did receive the web-based training would have significantly lower failure rates and significantly higher end-of-program averages. The goal was to show that the web-based training program would be an effective supplement to the FMCCO's Part A and Part B training courses. Based on the final findings, the average score of the WBT group was significantly higher than the non-WBT group (Table 3). During the prototype phase, the findings were quite different due to the following confounds.

1. Lack of web access during Part A and Part B due to infrastructure problems at the Pat Thomas Law Enforcement Academy. The UCF team believes this is the most significant confound affecting the study. The students that essentially were supposed to use the web-based training were not able to due to lack of web access during the Part B class and the six-week gap between Part B and the FTO program. This, in combination with instructor issues may have negatively affected the scores.
2. Differences in instructors and their instructional strategies. During the 2006 Part B class, one of the UCF team members attended the class. This same UCF team member attended the 2007 Part B class and reported huge differences in the instructors' teaching strategies. The UCF team member reported that the 2007 instructor made many mistakes and had difficulty explaining concepts to the students. The UCF team believes that the poor instruction led to lower scores during week two of the FTO program. In fact, the FTO program in Ft. Myers had to be adjusted because several of the safety inspector candidates needed remediation. Eventually these safety inspectors had to be dropped from the program.
3. Differences in field training officer (FTO) training strategies and assessment techniques. During 2007, additional field training officers participated in the evaluation of candidate safety inspectors. The UCF team noted that some FTOs evaluated students at week two, while others evaluated the students at week four (essentially two weeks after coming out of limbo). It was discovered that the FTOs from 2006 evaluated the candidate safety inspectors at week four (two weeks after

coming out of limbo), thereby giving the safety inspectors more time to improve their scores. This, in combination with the different training and evaluation methods of the FTOs may have greatly affected the scores.

4. Small sample size. One of the major confounds in this study was the small sample size. It is difficult to draw any conclusions when you have a sample size of eight or fewer. Unfortunately, due the limited amount of safety inspectors that go through the program, a larger sample size is difficult to achieve.
5. Differences in students' backgrounds and experiences. In many cases, each Part B class has a large variation in the different backgrounds and experiences of the student/candidate safety inspectors. In some cases, students come from law enforcement backgrounds, while others do not. Additionally, some students have prior knowledge of CMVs, whether they were truck mechanics, former truck drivers, or had jobs that required them to be familiar with the parts and systems of a CMV. These differences in backgrounds and experiences may have affected the outcome of the study. For example, 55% of the 2006 students claimed to have had prior CMV experience, while only 30% of the 2007 students claimed to have had CMV experience. Likewise, 45% of the 2006 students claimed to have prior law enforcement experience, while 60% of the 2007 students claimed to have prior law enforcement experience. The UCF team believes that prior CMV experience (knowing the parts and systems of the truck) might play a stronger role toward success in the FTO program because the FTO program relies heavily on identification of CMV parts. This may be one of the reasons the 2006 safety inspectors had higher week 2 scores based on the FTO evaluation form.

During the operational phase of the program, these problems were addressed and either eliminated or minimized in order to improve the accuracy of data collected in the following manner:

1. Lack of web access during Part A and Part B due to infrastructure problems at the Pat Thomas Law Enforcement Academy. The UCF team, in coordination with leadership at FMCCO, was able to provide the infrastructure so that candidate safety inspectors could use the web-based Safety Inspector Training and Certification Program during class and after hours. For those with no law enforcement or CMV backgrounds, or for those who struggled with certain subject areas during the class, having access to the web-based training at all hours enabled them to tutor themselves so they were prepared each day. The UCF team believes that this played a major role in the improvement of passing rates for Part A and Part B, as well as the improved success rate later on in the academy.
2. Differences in instructors and their instructional strategies. Although the UCF team member had a better experience in the 2008 and 2009 classes, there are still differences in instructor teaching strategies. Although the instructors follow the same general syllabus, not all instructors teach the same. It is the UCF team's recommendation that course instructors should be certified in adult learning strategies. However, UCF and FMCCO do not have the authority to determine which national instructors might be sent to teach at the academy. One thing to note is that

the Florida instructors seemed to have more success in teaching both Part A and Part B, and employed more teaching strategies.

3. Differences in field training officer (FTO) training strategies and assessment techniques: As part of the operational phase contract, the UCF team helped to develop better FTO training, specifically on adult-learning strategies and proper assessment techniques. UCF employed this during the FTO training sessions that took place in November 2009 in Chipley and Lake City. The UCF team described how to use the new form properly to assess candidate safety inspectors, and explained the critical aspect of adult learning. Confusion about when to evaluate the safety inspectors was resolved by changing the wording on the evaluation forms. Instead of the evaluation period going by *week*, the UCF team changed it to *phase* to be more in line with the FTO terminology. Candidate safety inspectors are now evaluated at the end of Phase 1, Phase 2, and Phase 3, rather than Week 2 (after limbo), Week 8, and week 14. Even with the FTO training, the UCF team still believes there are differences in training and evaluation methods among FTOs throughout the various divisions within the state.
4. Small sample size: One of the major confounds in this study was the small sample size. Although the sample size has improved from 21 to 35, it is still a relatively small sample size, making it difficult to draw any conclusions. Unfortunately, due the limited amount of safety inspectors that go through the program, a larger sample size is difficult to achieve.
5. Differences in students' backgrounds and experiences: Students attending both Part A and Part B still show a large variation in backgrounds and experiences within each class. However, when comparing the non-WBT group to the WBT group, note there is a fair amount of consistency in the percentages of students who come from a law enforcement background, CMV background, or neither. In the non-WBT group, nine out of 21 students (43%) had prior CMV experience. Meanwhile, in the WBT group, 14 out of 35 students (40%) had prior CMV experience. In the non-WBT group, 11 out of the 21 students (52%) had prior law enforcement experience. Whereas in the WBT group, 18 out of the 35 students (51%) had prior law enforcement experience. As reported in the interim final report in 2008, when comparing the original group of candidate safety inspectors, it was apparent that having prior CMV knowledge seemed to have the greatest impact on improved FTO evaluation scores.

   However, with the most recent group of students, the UCF team took these statistics a step further and broke them down into additional categories. It is quite clear from the statistics in Table 7 that those with both prior CMV and law enforcement experience performed the best on the FTO evaluations with an average score of 4.75. The next best scores occurred for those who had prior only CMV experience with a score of 4.53. After that, there was a significant drop in the scores. Surprisingly, those who had no prior CMV or law enforcement experience had a score of 4.12. Those who performed the worse were the ones who had prior law enforcement experience only. Their average score was 4.02. Although the sample size was small, it can be inferred that prior CMV experience seems to have the most positive effect on performance of candidate safety inspectors in the FTO program.

Chapter Six: Conclusions

Based on the positive response from subject matter experts, sponsors, and potential students, as well as the results from the study, the UCF team believes that the web-based Safety Inspector Training and Certification Program will continue to improve the training and recertification of novice and experienced safety inspectors, as well as higher-ranked officers, and others involved in the inspection process. When the UCF team was awarded the contract to take the program from a prototype phase to an operational phase, the following recommendations were made and accomplished:

Update and reorganize Part B content based on regulatory changes
The UCF team successfully accomplished this by sending out review and edit forms to SMEs to provide updates and corrections to the content. The UCF team then implemented the changes directly into the learning management system.

Analyze, design, and develop Part A content
The UCF team successfully designed and developed all Part A content and had it reviewed by subject matter experts using review and edit forms. The content was developed in the learning management system.

Develop and convert current HTML content to an operational learning management system that adds capability of tracking students
All of the content that was developed in the prototype was converted to the learning management system and reviewed by SMEs. Additionally, students, instructors, FTO, and higher-level officers were set up with different access capabilities. For example, students had standard access to the course. Instructors and higher-level officers had additional capabilities in which they were able to track the student's progress throughout the program. Additionally, FTOs were given access to fill out online FTO evaluation forms if they desired.

Develop a database reference library for easy access to content, regulations, and out-of-service criteria during roadside inspection
The learning management system was set up with a search tool that enabled safety inspectors to search for content, regulations, out-of-service criteria, and so forth, in the form of a reference library.

Update and maintain program
The UCF team's web developer designed an update and maintenance plan for FMCCO to implement. FMCCO has not yet decided who will maintain the course. Thoughts are that IST-UCF may be funded to maintain the course or perhaps FMCSA might be interested in maintaining the course.

Provide Training program upgrade/implementation plan
Part A and Part B class upgrade
The UCF team developed a plan to improve delivery of the Part A and Part B classes at the academy. FMCCO, upon the recommendation of the UCF team, decided to keep Part

A the same length, but add an additional week to Part B so that safety inspectors could get more hands-on experience inspecting vehicles. These inspections go toward the required 32 inspections safety inspectors must complete in order to be certified. The UCF team believes that this additional week played an important role in the improvement of FTO evaluation scores due to the added experience at the academy.

Revised training strategy for academy

The FMCCO made minor changes to the academy by changing the dates to give Part A and Part B to safety inspectors. The UCF team recommended that Part A and Part B should be given as close to the 14-week FTO program as possible. However, FMCCO chose not to implement this suggestion. The UCF team also recommended that web access be given to the students at the dorm so they can study Part A and Part B content after hours. This suggestion was implemented and the UCF team believes it played a significant role in candidate safety inspector preparation for the following day of class.

FTO program: upgrade training of FTOs with new FTO evaluation form

The UCF team made some minor modifications to the FTO evaluation form per the request of the FTOs. However, the majority of the training upgrade was the development of an adult learning research guide as well as a draft FTO guide for field training officers (Appendix G and H). Additionally, workshop training was provided to FTOs on adult learning strategies during their annual FTO meetings. However, due to competing priorities and personnel changes, FMCCO was not able to review and provide feedback on both the adult learning research and the draft FTO guide. IST hopes that the entire FTO program is revamped to incorporate additional adult learning strategies. Current evaluation techniques are extremely subjective and not focused on specific behavioral elements.

Post-FTO plan

If funding is continued, the UCF team would like to conduct one more FTO evaluation six months after the completion of the 14-week FTO program.

Finally, due to the success of the web-based Safety Inspector Training and Certification Program, it is critical that FMCCO or FMCSA continue to update and maintain the program so it does not become obsolete. Aside from updating content, it is critical that an entity maintain the Moodle database that has been developed. Additionally, the web-based program has shown its validity by the vast improvement of safety inspector passing rates at the academy and improvement of FTO evaluation scores during Phase 1, Phase 2, and Phase 3 of the 14-week FTO program. (Muzio, 2002).

The entire goal of the program was not only to improve the on-the-job performance of safety inspectors, but also to implement this program with the hope that other states, as well as the federal government, will adopt this blended learning intervention. It is the UCF team's, as well as the FMCCO team's hope, that additional modules be funded for development in the future such as Hazardous Materials, Cargo Tank, Weights, Passenger vehicles, etc.

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Articles or Abstracts written:

Abstract prepared for 2005 TESI conference. Building on the Advanced Distributed Learning (ADL) initiative and the concepts of re-usable content objects, the abstract describes a web-based training program that is being designed to train motor carrier compliance officers on mechanical and regulatory safety compliance.

A Computer-Based Safety Inspector Training and Certification Program

Paper prepared for 2005 International Bus and Truck Safety and Security Symposium. Building on the work we have done for the computer-based safety inspector training and certification program, the abstract describes the need for a computer-based commercial vehicle safety inspector training program and the best methods of training to improve safety inspector performance. Based on findings of prototype application, the paper will describe what revisions are needed to improve the training program.
Signed statement that the paper went through an editorial review.

Simulated Vehicle Support: Commercial to Military Reverse Technology Transfer

Paper written for the 2007 Interservice/Industry Training Simulation and Education Conference (I/ITSEC). This paper discusses how the work the UCF team has completed for FMCSA and FDOT can be applied to military, specifically for wheeled vehicles. The UCF team believes that with improved inspection of wheeled military vehicles, specifically in the harsh conditions in Iraq and Afghanistan, the US military can save time and money by improving maintenance of those vehicles.

Appendix A
FTO Safety Inspector Evaluation Form

FTO Safety Inspector Evaluation Form: Level I Inspection Criteria

Please use the following evaluation form at the end of Phase 1, Phase 2, and Phase 3 of the FTO program to determine the safety inspector trainee's progress. Keep in mind that the trainee is not expected to score high scores early on in the program. The purpose of this evaluation form is to determine whether the trainee's skills have improved over the course of the FTO program. Please fill out the survey as accurately as possible.

Section A: Background

How many months has it been since safety inspector trainee was hired?	
Has the safety inspector trainee been riding with other officers for on-the-job training before the academy? How long?	
Does safety inspector have CMV experience with previous job (driving, mechanical experience)?	
Does safety inspector have previous law enforcement experience?	

Section B: Level I Inspection

Pre-Inspection	Phase 1	Phase 2	Phase 3
Logs into the ASPEN system correctly	Yes No	Yes No	Yes No
Correctly identifies the type of CMV being stopped (straight truck, semi, full, double, etc.)	Yes No	Yes No	Yes No
Stops the CMV in a "safe" area	Yes No	Yes No	Yes No
Approaches the CMV and the driver appropriately	Yes No	Yes No	Yes No
Shows awareness toward traffic as well as the driver's demeanor	Yes No	Yes No	Yes No
Score (for administrator only)			

Preparing the Driver and Vehicle	Phase 1	Phase 2	Phase 3
Places *chock blocks* at the driver side drive axle correctly	Yes No	Yes No	Yes No
Greets the driver in a professional manner	Yes No	Yes No	Yes No
Explains to the driver why the vehicle was stopped	Yes No	Yes No	Yes No
Asks driver for drivers license, registration, medical card and bills of lading (if required)	Yes No	Yes No	Yes No
Identifies whether vehicle is being driven legally based on drivers license, registration, and medical card	Yes No	Yes No	Yes No
Asks for trailer registration	Yes No	Yes No	Yes No
Secures driver's information/documents prior to inspection	Yes No	Yes No	Yes No
Explains the inspection procedure to the driver	Yes No	Yes No	Yes No

Explains hand signals used during the inspection	Yes No	Yes No	Yes No
Score (for administrator only)			

Hazardous Materials	**Phase 1**	**Phase 2**	**Phase 3**
Determines whether vehicle is transporting hazardous materials	Yes No	Yes No	Yes No
Correctly identifies they type of hazardous material being transported	Yes No	Yes No	Yes No
Checks for the presence of placards	Yes No	Yes No	Yes No
Looks for visible leaks, spills, and unsecured cargo	Yes No	Yes No	Yes No
If the vehicle has cargo or portable tanks, looks for I.D. numbers that are displayed on the placard if required	Yes No	Yes No	Yes No
Determines how to calculate volumes of tanks and cylinders	Yes No	Yes No	Yes No
Score (for administrator only)			

Inside Cab and Air Loss Rate	**Phase 1**	**Phase 2**	**Phase 3**
Checks to see if the driver is wearing his or her seat belt	Yes No	Yes No	Yes No
Checks to see that there are no indications of alcohol and/or drug use	Yes No	Yes No	Yes No
Checks to see if driver is carrying proper safety equipment	Yes No	Yes No	Yes No
Asks driver if he or she was properly trained on the use of safety equipment	Yes No	Yes No	Yes No
Checks physical condition of cab (speedometer, floors, securement of seats, windshield wipers, mirrors, etc.)	Yes No	Yes No	Yes No
Checks steering wheel lash and condition of steering column	Yes No	Yes No	Yes No
Checks air loss rate	Yes No	Yes No	Yes No
Checks for operation of low air pressure warning device	Yes No	Yes No	Yes No
Score (for administrator only)			

Front of Vehicle and Steering Axle	Phase 1	Phase 2	Phase 3
Checks operation of lamps	Yes No	Yes No	Yes No
Checks operation of horn	Yes No	Yes No	Yes No
Checks windshield condition and proper operation of windshield wipers	Yes No	Yes No	Yes No
Demonstrates proper use of hand signals	Yes No	Yes No	Yes No
Demonstrates left and right based on direction driver is faced	Yes No	Yes No	Yes No
Asks driver to open up hood of truck	Yes No	Yes No	Yes No
Checks whether critical parts associated with the engine are secure and in good condition	Yes No	Yes No	Yes No
If viewable, checks condition of suspension, steering mechanisms, and frame	Yes No	Yes No	Yes No
Score (for administrator only)			

Sides of Tractor	Phase 1	Phase 2	Phase 3
Correctly identifies type of rims on vehicle	Yes No	Yes No	Yes No
Checks condition of rims and lugs	Yes No	Yes No	Yes No
Twists lugnuts to see if they are secured	Yes No	Yes No	Yes No
Checks condition and groove depth of tires	Yes No	Yes No	Yes No
Visually identifies whether tires are inflated properly	Yes No	Yes No	Yes No
Recognizes whether the color, condition, and number of side marker lamps are in compliance	Yes No	Yes No	Yes No
Identifies all required lamps versus additional lamps	Yes No	Yes No	Yes No
Score (for administrator only)			

Saddle Tank Area and Front of Trailer	Phase 1	Phase 2	Phase 3
Checks to see if fuel tank is secure	Yes No	Yes No	Yes No
Checks to see if fuel lines come in contact with the exhaust and whether crossover lines are secured	Yes No	Yes No	Yes No
Looks for fuel leaks	Yes No	Yes No	Yes No
Looks for indications of exhaust leaks and carbon deposits	Yes No	Yes No	Yes No
Inspects frame and cross members for damage	Yes No	Yes No	Yes No
Checks to see if air and electrical lines come in contact with frame and cross members	Yes No	Yes No	Yes No
Inspects air and electrical lines by making sure they are suspending free of tangles, and have enough slack for the vehicle to make turns.	Yes No	Yes No	Yes No
Inspects air and electrical connections and listens for air leaks	Yes No	Yes No	Yes No
Score (for administrator only)			

Sides and Rear of Trailer	Phase 1	Phase 2	Phase 3
Inspects condition of the wheels, rims and tires	Yes No	Yes No	Yes No
Twists lugnuts to see if they are secured	Yes No	Yes No	Yes No
Checks for debris in between the dual wheels and whether they are spaced properly	Yes No	Yes No	Yes No
Inspects the upper, lower and sliding fifth wheel area to see if they are secured to the frame, locked, and seated properly	Yes No	Yes No	Yes No
Checks the sliding tandem to make sure the teeth are meshed properly and there are no worn or missing parts	Yes No	Yes No	Yes No
Inspects rear lamps for color, condition, and whether they are working properly	Yes No	Yes No	Yes No
Uses appropriate hand signals to communicate with the driver	Yes No	Yes No	Yes No
Correctly inspects cargo for securement and load limits	Yes No	Yes No	Yes No
Recognizes whether the color, condition, and number of side marker lamps are in compliance	Yes No	Yes No	Yes No
Score (for administrator only)			

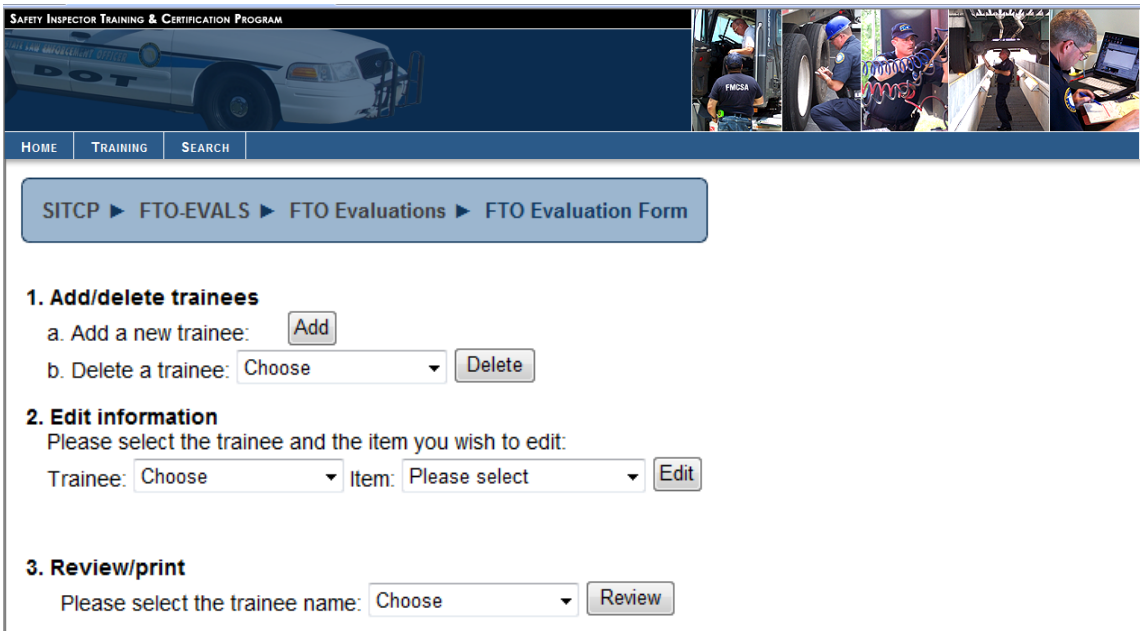
Under Trailer/Brake Adjustment	Phase 1	Phase 2	Phase 3
Inspects frame for cracks, welds, and other defects	Yes No	Yes No	Yes No
Inspects the steering system for defects	Yes No	Yes No	Yes No
Inspects condition of brakes	Yes No	Yes No	Yes No
Correctly notes the size and type of brake chamber and looks for mismatches	Yes No	Yes No	Yes No
Correctly marks and measures push rod travel	Yes No	Yes No	Yes No
Listens for signs of air loss	Yes No	Yes No	Yes No
Checks to see if the parts associated with the brake system are secure	Yes No	Yes No	Yes No
Inspects items that were not easily viewable from outside the truck (suspension, steering, etc)	Yes No	Yes No	Yes No
Score (for administrator only)			

Fifth Wheel Movement	Phase 1	Phase 2	Phase 3
Instructs the driver to put the vehicle in gear, release the service brakes, and apply the trailer brakes	Yes No	Yes No	Yes No
Removes chocks in order to effectively conduct the fifth wheel movement test	Yes No	Yes No	Yes No
Instructs the driver to gently rock the tractor and watches for fifth wheel movement	Yes No	Yes No	Yes No
Puts chocks back against the wheels upon completion of the test	Yes No	Yes No	Yes No
Only conducts fifth wheel movement check if there are visual signs of fifth wheel movement	Yes No	Yes No	Yes No
Score (for administrator only)			

Tractor Protection Valve	Phase 1	Phase 2	Phase 3
Explains testing procedure to driver	Yes No	Yes No	Yes No
Makes sure driver does all connecting and disconnecting of items on the vehicle	Yes No	Yes No	Yes No
Instructs the driver to release the emergency brakes by pushing in the dash valves.	Yes No	Yes No	Yes No
Ensures that the trailer emergency brakes engage when the supply line at the hose couplers is broken.	Yes No	Yes No	Yes No
Ensures that the air loss stops when pressure in tractor's systems drops to 20-35 psi	Yes No	Yes No	Yes No
Score (for administrator only)			

Completing the Inspection	Phase 1	Phase 2	Phase 3
Identifies the correct federal regulation(s) to use for a particular type of defect	Yes No	Yes No	Yes No
Correctly identifies any out-of-service violations by using the North American Standard Out-of-Service Criteria	Yes No	Yes No	Yes No
Correctly enters the data into the ASPEN System in an easy to understand manner and uploads	Yes No	Yes No	Yes No
Correctly determines whether or not a CVSA decal is to be placed on the vehicle	Yes No	Yes No	Yes No
Explains all the violations or warnings to the driver	Yes No	Yes No	Yes No
Takes appropriate enforcement action for all violations	Yes No	Yes No	Yes No
Records inspection in weekly report	Yes No	Yes No	Yes No
Score (for administrator only)			

Appendix B
FTO Safety Inspector ONLINE Evaluation Form



Add New Trainee

Trainee's Name:	
What was the safety inspector trainee's hiring date?	
Did the safety inspector trainee have any on-the-job training before attending the academy?(e.g. riding along with officers) If so, how long?	
Before being hired as a safety inspector, did he/she have any prior CMV experience such as driving a commercial motor vehicle or being a CMV mechanic?	Yes No
Does safety inspector have previous law enforcement experience?	Yes No

Evaluation Form

Trainee Name:sample Phase: 1

Section 1. Pre-Inspection (Please save each section before you leave the page.)

1). Logs into the ASPEN system correctly	Yes No
2). Correctly identifies the type of CMV being stopped(straight truck,semi,full,double,etc.)	Yes No
3). Stops the CMV in a "safe" area	Yes No
4). Approaches the CMV and the driver appropriately	Yes No
5). Shows awareness toward traffic as well as the driver's demeanor	Yes No

◄ Save ►

NOTE: This is just a sample of the form that is filled out. There are actually three phases and 12 sections. However, for the purpose of this appendix, a screen shot of Phase one section 1 was provided as a sample.

FTO evaluation form can be found at the following site. However, in order to have access and fill out the form, you must have "non-editing instructor" status.
http://fmcco.rapter.ist.ucf.edu/mod/ftoeval/view.php?id=790

Appendix C
FTO Evaluation Scoring Sheet

FTO Safety Inspector Evaluation Form: Level I Inspection Scoring System

5 = 100%
4 = 75% - 99%
3 = 50% - 74%
2 = 25% - 49%
1 = 24% or less

Pre-Inspection

Score	Criteria
5	5 of 5
4	4 of 5
3	3 of 5
2	2 of 5
1	0 or 1 of 5

Preparing the Driver and Vehicle

Score	Criteria
5	9 of 9
4	7 or 8 of 9
3	5 or 6 of 9
2	3 or 4 of 9
1	0, 1 and 2 of 9

Hazardous Materials

Score	Criteria
5	6 of 6
4	5 of 6
3	3 or 4 of 6
2	2 of 6
1	0 or 1 of 6

Inside Cab and Air Loss Rate

Score	Criteria
5	8 of 8
4	6 or 7 of 8
3	4 or 5 of 8
2	2 or 3 of 8
1	0 or 1 of 8

Front of Vehicle and Steering Axle

Score	Criteria
5	8 of 8
4	6 or 7 of 8
3	4 or 5 of 8
2	2 or 3 of 8
1	0 or 1 of 8

Sides of Tractor

Score	Criteria
5	7 of 7

4	6 of 7
3	4 or 5 of 7
2	2 or 3 of 7
1	0 or 1 of 7

Saddle Tank and Front of Trailer

Score	Criteria
5	8 of 8
4	6 or 7 of 8
3	4 or 5 of 8
2	2 or 3 of 8
1	0 or 1 of 8

Sides and Rear of Trailer

Score	Criteria
5	9 of 9
4	7 or 8 of 9
3	5 or 6 of 9
2	3 or 4 of 9
1	0, 1 and 2 of 9

Under Trailer and Brake Adjustment

Score	Criteria
5	8 of 8
4	6 or 7 of 8
3	4 or 5 of 8
2	2 or 3 of 8
1	0 or 1 of 8

Fifth Wheel Movement

Score	Criteria
5	5 of 5
4	4 of 5
3	3 of 5
2	2 of 5
1	0 or 1 of 5

Tractor Protection Valve

Score	Criteria
5	5 of 5
4	4 of 5
3	3 of 5
2	2 of 5
1	0 or 1 of 5

Completing the Inspection

Score	Criteria
5	7 of 7
4	6 of 7
3	4 or 5 of 7
2	2 or 3 of 7
1	0 or 1 of 7

Appendix D
Safety Inspector Results Summarization Form

FTO Safety Inspector Evaluation Form: Level I Inspection

Safety Inspector #1: Name
Division:
Hire Date:
Riding for OJT:
CMV Experience:
Law Enforcement Experience:

Category	Phase 1	Phase 2	Phase 3
Pre-Inspection			
Preparing the Driver and Vehicle			
Hazardous Materials			
Inside Cab and Air Loss Rate			
Front of Vehicle and Steering Axle			
Sides of Tractor			
Saddle Tank and Front of Trailer			
Sides and Rear of Trailer			
Under Trailer and Brake Adjustment			
Fifth Wheel Movement			
Tractor Protection Valve			
Completing the Inspection			

Appendix E
Average Scores of Safety Inspectors (Non-WBT Group A vs. Group B (n = sample size)

Safety Inspector Average Scores
Group A: No Web-Based Training
Sample Size: 7

Category	Phase 1 (n=7)	Phase 2 (n=7)	Phase 3 (n=7)
Pre-Inspection	3.29 (23)	4.71 (33)	4.43 (31)
Preparing the Driver and Vehicle	2.86 (20)	4.86 (34)	4.86 (34)
Hazardous Materials	1.00 (7)	1.71 (12)	2.00 (14)
Inside Cab and Air Loss Rate	3.00 (21)	4.29 (30)	4.29 (30)
Front of Vehicle and Steering Axle	2.86 (20)	4.71 (33)	4.86 (34)
Sides of Tractor	2.43 (17)	4.71 (33)	4.86 (34)
Saddle Tank and Front of Trailer	2.29 (16)	4.57 (32)	4.57 (32)
Sides and Rear of Trailer	2.71 (19)	4.86 (34)	4.86 (34)
Under Trailer and Brake Adjustment	2.86 (20)	5.00 (35)	5.00 (35)
Fifth Wheel Movement	1.00 (7)	3.14 (22)	3.29 (23)
Tractor Protection Valve	2.43 (17)	5.00 (35)	5.00 (35)
Completing the Inspection	3.43 (24)	4.86 (34)	5.00 (35)
Average:	**2.51**	**4.36**	**4.41**

Safety Inspector Average Scores
Group B: No Web=Based Training
Sample Size: 8 (varied)

Category	Phase 1 (n=8)	Phase 2 (n=4)	Phase 3 (n=3)
Pre-Inspection	2.38 (19)	4.75 (19)	5.00 (15)
Preparing the Driver and Vehicle	1.75 (14)	5.00 (20)	5.00 (15)
Hazardous Materials	1.00 (8)	1.50 (6)	1.67 (5)
Inside Cab and Air Loss Rate	2.25 (18)	4.00 (16)	5.00 (15)
Front of Vehicle and Steering Axle	2.63 (21)	5.00 (20)	5.00 (15)
Sides of Tractor	2.38 (19)	5.00 (20)	4.67 (14)
Saddle Tank and Front of Trailer	2.25 (18)	5.00 (20)	4.67 (14)
Sides and Rear of Trailer	2.13 (17)	5.00 (20)	4.67 (14)
Under Trailer and Brake Adjustment	2.38 (19)	5.00 (20)	5.00 (15)
Fifth Wheel Movement	1.38 (11)	3.75 (15)	4.33 (13)
Tractor Protection Valve	1.63 (13)	4.50 (18)	5.00 (15)
Completing the Inspection	1.75 (14)	4.00 (16)	3.67 (11)
Average:	**1.99**	**4.38**	**4.47**

Appendix F
Average Scores of Safety Inspectors (WBT Group A vs. Group B vs. Group C) (n = sample size)

Safety Inspector Average Scores (YEAR 3 WITH COMPUTER BASED TRAINING)
(Group A Only)
Sample Size: 13

Category	Phase 1 (n=13)	Phase 2 (n=13)	Phase 3 (n=13)
Pre-Inspection	5.00 (65)	5.00 (65)	5.00 (65)
Preparing the Driver and Vehicle	4.69 (61)	4.92 (64)	4.92 (64)
Hazardous Materials	4.17 (50) **(12)**	4.36 (48) **(11)**	4.83 (58) **(12)**
Inside Cab and Air Loss Rate	3.77 (49)	4.62 (60)	4.77 (62)
Front of Vehicle and Steering Axle	4.77 (62)	4.85 (63)	5.00 (65)
Sides of Tractor	4.23 (55)	5.00 (65)	4.92 (64)
Saddle Tank and Front of Trailer	4.38 (57)	4.77 (62)	4.92 (64)
Sides and Rear of Trailer	4.08 (53)	4.85 (63)	4.85 (63)
Under Trailer and Brake Adjustment	4.23 (55)	4.62 (60)	5.00 (65)
Fifth Wheel Movement	2.69 (35)	4.00 (48) **(12)**	3.77 (49)
Tractor Protection Valve	4.08 (53)	4.38 (57)	4.92 (64)
Completing the Inspection	3.92 (51)	4.85 (63)	4.92 (64)
Average:	**4.17 (50.01)**	**4.69 (56.22)**	**4.82 (57.82)**

Safety Inspector Average Scores (YEAR 3 WITH COMPUTER BASED TRAINING)
(Group B Only)
Sample Size: 6

Category	Phase 1 (n=6)	Phase 2 (n=6)	Phase 3 (n=6)
Pre-Inspection	4.17 (25)	5.00 (30)	5.00 (30)
Preparing the Driver and Vehicle	4.33 (26)	5.00 (30)	5.00 (30)
Hazardous Materials	3.00 (18)	5.00 (30)	5.00 (30)
Inside Cab and Air Loss Rate	3.67 (22)	5.00 (30)	5.00 (30)
Front of Vehicle and Steering Axle	5.00 (30)	5.00 (30)	5.00 (30)
Sides of Tractor	4.50 (27)	5.00 (30)	5.00 (30)
Saddle Tank and Front of Trailer	4.67 (28)	5.00 (30)	5.00 (30)
Sides and Rear of Trailer	4.33 (26)	5.00 (30)	5.00 (30)
Under Trailer and Brake Adjustment	4.50 (27)	5.00 (30)	5.00 (30)
Fifth Wheel Movement	2.33 (14)	4.83 (29)	5.00 (30)
Tractor Protection Valve	4.67 (28)	5.00 (30)	5.00 (30)
Completing the Inspection	4.83 (29)	5.00 (30)	5.00 (30)
Average:	**4.17 (50.00)**	**4.99 (59.83)**	**5.00 (60.00)**

Safety Inspector Average Scores (YEAR 3 WITH COMPUTER BASED TRAINING)

(Group C Only)
Sample Size: 16

Category	Phase 1 (n=16)	Phase 2 (n=16)	Phase 3 (n=16)
Pre-Inspection	4.50 (72)	4.94 (79)	5.00 (80)
Preparing the Driver and Vehicle	4.56 (73)	4.88 (78)	4.88 (78)
Hazardous Materials	4.38 (70)	4.44 (71)	4.94 (79)
Inside Cab and Air Loss Rate	4.06 (65)	4.75 (76)	4.81 (77)
Front of Vehicle and Steering Axle	4.81 (77)	5.00 (80)	5.00 (80)
Sides of Tractor	4.31 (69)	4.69 (75)	4.94 (79)
Saddle Tank and Front of Trailer	4.75 (76)	4.63 (74)	4.94 (79)
Sides and Rear of Trailer	4.31 (69)	4.88 (78)	5.00 (80)
Under Trailer and Brake Adjustment	4.88 (78)	4.88 (78)	5.00 (80)
Fifth Wheel Movement	3.81 (61)	4.69 (75)	4.88 (78)
Tractor Protection Valve	4.69 (75)	4.94 (79)	4.94 (79)
Completing the Inspection	4.69 (75)	4.56 (73)	5.00 (80)
Average:	**4.48 (53.75)**	**4.77 (57.28)**	**4.94 (59.33)**

Safety Inspector Average Scores (YEAR 3 WITH COMPUTER BASED TRAINING)
(Includes BOTH Group A, Group B, and Group C)
Sample Size: 35

Category	Phase 1 (n=35)	Phase 2 (n=35)	Phase 3 (n=35)
Pre-Inspection	4.63 (162)	4.97 (174)	5.00 (175)
Preparing the Driver and Vehicle	4.57 (160)	4.91 (172)	4.91 (172)
Hazardous Materials	4.06 (138) **(34)**	4.52 (149) **(33)**	4.91 (167) **(34)**
Inside Cab and Air Loss Rate	3.89 (136)	4.74 (166)	4.83 (169)
Front of Vehicle and Steering Axle	4.83 (169)	4.94 (173)	5.00 (175)
Sides of Tractor	4.31 (151)	4.86 (170)	4.94 (173)
Saddle Tank and Front of Trailer	4.60 (161)	4.74 (166)	4.94 (173)
Sides and Rear of Trailer	4.23 (148)	4.89 (171)	4.94 (173)
Under Trailer and Brake Adjustment	4.57 (160)	4.80 (168)	5.00 (175)
Fifth Wheel Movement	3.14 (110)	4.47 (152) **(34)**	4.49 (157)
Tractor Protection Valve	4.46 (156)	4.74 (166)	4.94 (173)
Completing the Inspection	4.43 (155)	4.74 (166)	4.97 (174)
Average:	**4.31 (51.72)**	**4.78 (57.32)**	**4.91 (58.87)**

Appendix E
Safety Inspector Results Full Form (Sample of actual results)

SITCP ► FTO-EVALS ► FTO Evaluations ► FTO Evaluation Form

FTO Safety Inspector Evaluation Form: Level I Inspection Criteria

Section A: Background **Safety Inspector Name: Kelie Matthews**

What was the safety inspector trainee's hiring date?	2009-07-01
Did the safety inspector trainee have any on-the-job training before attending the academy?(e.g. riding along with officers) If so, how long?	0
Before being hired as a safety inspector, did he/she have any prior CMV experience such as driving a commercial motor vehicle or being a CMV mechanic?	No
Does safety inspector have previous law enforcement experience?	No

Section B: Level I Inspection

Pre-Inspection	Phase 1	Phase 2	Phase 3
1). Logs into the ASPEN system correctly	✓	✓	✓
2). Correctly identifies the type of CMV being stopped(straight truck,semi,full,double,etc.)	✓	✓	✓
3). Stops the CMV in a "safe" area	✗	✓	✓
4). Approaches the CMV and the driver appropriately	✓	✓	✓
5). Shows awareness toward traffic as well as the driver's demeanor	✗	✓	✓
Score	3	5	5

Preparing the Driver and Vehicle	Phase 1	Phase 2	Phase 3
1). Places chock blocks at the driver side drive axle correctly	✓	✓	✓
2). Greets the driver in a professional manner	✓	✓	✓
3). Explains to the driver why the vehicle was stopped	✓	✓	✓
4). Asks driver for drivers license, registration, medical card and bills of lading (if required)	✓	✓	✓
5). Identifies whether vehicle is being driven legally based on drivers license, registration, and medical card	✓	✓	✓
6). Asks for trailer registration	✓	✓	✓
7). Secures driver's information/documents prior to inspection	✓	✓	✓
8). Explains the inspection procedure to the driver	✓	✓	✓
9). Explains hand signals used during the inspection	✓	✓	✓
Score	5	5	5

Hazardous Materials	Phase 1	Phase 2	Phase 3
1). Determines whether vehicle is transporting hazardous materials	✓	✓	✓
2). Correctly identifies the type of hazardous material being transported	✓	✓	✓
3). Checks for the presence of placards	✓	✓	✓
4). Looks for visible leaks, spills, and unsecured cargo	✓	✓	✓
5). If the vehicle has cargo or portable tanks, looks for I.D. numbers that are displayed on the placard if required	✓	✓	✓
6). Determines how to calculate volumes of tanks and cylinders	✗	✓	✓
Score	4	5	5

Inside Cab and Air Loss Rate	Phase 1	Phase 2	Phase 3
1). Checks to see if the driver is wearing his or her seat belt	✓	✓	✓
2). Checks to see that there are no indications of alcohol and/or drug use	✓	✓	✓
3). Checks to see if driver is carrying proper safety equipment	✓	✓	✓
4). Asks driver if he or she was properly trained on the use of safety equipment	✗	✓	✓
5). Checks physical condition of cab(speedometer, floors, securement of seats, windshield wipers, mirrors, etc.)	✓	✓	✓
6). Checks steering wheel lash and condition of steering column	✓	✓	✓
7). Checks air loss rate	✗	✓	✓
8). Checks for operation of low air pressure warning device	✓	✓	✓
Score	4	5	5

Front of Vehicle and Steering Axle	Phase 1	Phase 2	Phase 3
1). Checks operation of lamps	✓	✓	✓
2). Checks operation of horn	✓	✓	✓
3). Checks windshield condition and proper operation of windshield wipers	✓	✓	✓
4). Demonstrates proper use of hand signals	✓	✓	✓
5). Demonstrates left and right based on direction driver is faced	✓	✓	✓
6). Asks driver to open up hood of truck	✓	✓	✓
7). Checks whether critical parts associated with the engine are secure and in good condition	✓	✓	✓
8). If viewable, checks condition of suspension, steering mechanisms, and frame	✓	✓	✓
Score	5	5	5

Sides of Tractor	Phase 1	Phase 2	Phase 3
1). Correctly identifies type of rims on vehicle	✗	✓	✓
2). Checks condition of rims and lugs	✓	✓	✓
3). Twists lugnuts to see if they are secured	✓	✓	✓
4). Checks condition and groove depth of tires	✓	✓	✓
5). Visually identifies whether tires are inflated properly	✓	✓	✓
6). Recognizes whether the color, condition, and number of side marker lamps are in compliance	✓	✓	✓
7). Identifies all required lamps versus additional lamps	✓	✓	✓
Score	4	5	5

Saddle Tank Area and Front of Trailer	Phase 1	Phase 2	Phase 3
1). Checks to see if fuel tank is secure	✓	✓	✓
2). Checks to see if fuel lines come in contact with the exhaust and whether crossover lines are secured	✓	✓	✓
3). Looks for fuel leaks	✓	✓	✓
4). Looks for indications of exhaust leaks and carbon deposits	✓	✓	✓
5). Inspects frames and cross memebers for damage	✓	✓	✓
6). Checks to see if air and electrical lines come in contact with frame and cross members	✓	✓	✓
7). Inspects air and electrical lines by making sure they are suspending free of tangles, and have enough slack for the vehicle to make turns	✓	✓	✓
8). Inspects air and electrical connections and listens for air leaks	✓	✓	✓
Score	5	5	5

Sides and Rear of Trailer	Phase 1	Phase 2	Phase 3
1). Inpects condition of the wheels, rims and tires	✓	✓	✓
2). Twists lugnuts to see if they are secured	✓	✓	✓
3). Checks for debris in between the dual wheels and whether they are spaced properly	✓	✓	✓
4). Inspects the upper, lower and sliding fifth wheel area to see if they are secured to the frame, locked, and seated properly	✓	✓	✓
5). Checks the sliding tandem to make sure the teeth are meshed properly and there are no worn or missing parts	✓	✓	✓
6). Inspects rear lamps for color, condition, and whether they are working properly	✓	✓	✓
7). Uses appropriate hand signals to communicate with the driver	✓	✓	✓
8). Correctly inspects cargo for securement and load limits	✓	✓	✓
9). Recognizes whether the color, condition, and number of side marker lamps are in compliance	✓	✓	✓
Score	5	5	5

Under Trailer/Brake Adjustment	Phase 1	Phase 2	Phase 3
1). Inspects frame for cracks, welds, and other defects	✓	✓	✓
2). Inspects the steering system for defects	✓	✓	✓
3). Inspects condition of brakes	✓	✓	✓
4). Correctly notes the size and type of brake chamber and looks for mismatches	✓	✓	✓
5). Correctly marks and measures push rod travel	✓	✓	✓
6). Listens for signs of air loss	✓	✓	✓
7). Checks to see if the parts associated with the brake system are secure	✓	✓	✓
8). Inspects items that were not easily viewable from outside the truck (suspension, steering, etc)	✓	✓	✓
Score	5	5	5

Fifth Wheel Movement	Phase 1	Phase 2	Phase 3
1). Instucts the driver to put the vehicle in gear, release the service brakes, and apply the trailer brakes	✓	✓	✓
2). Removes chocks in order to effectively conduct the fifth wheel movement test	✓	✓	✓
3). Instructs the driver to gently rock the tractor and watches for fifty wheel movement	✓	✓	✓
4). Puts chocks back against the wheels upon completion of the test	✓	✓	✓
5). Only conducts fifth wheel movement check if there are visual signs of fifth wheel movement	✓	✓	✓
Score	5	5	5

Tractor Protection Valve	Phase 1	Phase 2	Phase 3
1). Explains testing procedure to driver	✓	✓	✓
2). Makes sure driver does all connecting and disconnecting of items on the vehicle	✓	✓	✓
3). Instructs the driver to release the mergency brakes by pushing in the dash valves	✓	✓	✓
4). Ensures that the trailer emergency brakes engage when the supply line at the hose couplers is broken	✓	✓	✓
5). Ensures that the air loss stops when pressure in tractor's systems drops to 20-35 psi	✓	✓	✓
Score	5	5	5

Completing the Inspection	Phase 1	Phase 2	Phase 3
1). Identifies the correct federal regulation(s) to use for a particular type of defect	✓	✓	✓
2). Correctly identifies any out-of-service violations by using the North American Standard Out-of-Service Criteria	✓	✓	✓
3). Correctly enters the data into the ASPEN System in an easy to understand manner and uploads	✓	✓	✓
4). Correctly determines whether or not a CVSA decal is to be placed on the vehicle	✓	✓	✓
5). Explains all the violations or warnings to the driver	✓	✓	✓
6). Takes appropriate enforcement action for all violations	✓	✓	✓
7). Records inspection in weekly report	✓	✓	✓
Score	5	5	5

Print

Appendix E
Survey and Questionnaire

Computer-based Safety Inspector Training and Certification Program
Survey and Questionnaire

Before we begin the survey and questionnaire, please answer these questions so we can get a better understanding about your background and experiences.

What is your job background (what did you do prior to becoming a safety inspector)?

Do you have prior experience in dealing with commercial motor vehicles? Yes No

Do you have prior experience in the law enforcement industry? Yes No

Listed below are several statements about the Computer-based Safety Inspector Training and Certification Program you reviewed. Please fill out the survey and questionnaire, and add any additional comments you might have. Thank you again for taking the time to review our program.

5 – Strongly Agree
4 – Agree
3 – Undecided
2 – Disagree
1 – Strongly Disagree

1.	This program would be useful to me as an addition to the instructor led portion to the Part B class	5	4	3	2	1
2.	The content in this program was accurate.	5	4	3	2	1
3.	The content in this program was easy to read and understand.	5	4	3	2	1
4. `	The use of diagrams and images was helpful in understanding how to apply the regulations during an inspection.	5	4	3	2	1
5.	The quick quizzes were useful and provided me with good feedback.	5	4	3	2	1
6.	The reference library in this program will be useful on the job during a roadside inspection.	5	4	3	2	1
7.	This program will be useful to me during the FTO program.	5	4	3	2	1
8.	This program will be useful in helping me to refresh my knowledge in areas where I might be weak.	5	4	3	2	1
9.	The inspection scenarios (test) tested me on information I need to know during an inspection.	5	4	3	2	1
10.	The navigational features in this course such as the drop	5	4	3	2	1

down menus make this program easy to navigate through.

11	The program provided me with the right amount of detail in each lesson.	5	4	3	2	1

Please answer the following questions.

1. What did you like the most about this Computer-based Safety Inspector Training and Certification Program?

2. What did you like the least about this program?

4. What could be added to this program to make it better?

Appendix G
Adult Learning Guide

Adult Learning Module

1. Objectives:
    a. Explain why Adult Learning is Different.
    b. Name the key elements of Adult learning that need to be employed in FTO.
    c. Describe the key elements of Adult Learning with examples for FTO.
    d. Explain Performance Oriented Training as it relates to FMCCO FTO.
    e. Explain how to Objectively Evaluate Candidates performance.
    f. Describe how Coaching/Mentoring should be used in FTO.
    g. Explain how to integrate the on line Safety Inspector Training with FTO
    h. Describe how to motivate a Candidate to learn and improve performance.
2. Instructional Strategy/Outline
    a. Begin with a case study of Good and Bad FTO practices (Scott can help with this from our field studies.)

"Tell me and I'll forget. Show me and I may remember. Involve me and I'll understand."

-- Confucius

    b. Lecture on Adult Learning, *androgogy* per Knowles and how it applies to FTOs

Knowles' theory of andragogy

ADULTS LEARN DIFFERENTLY than young people. But more importantly, their reasons for learning are very different. Andragogy (Knowles, 1984), the theory of adult learning, attempts to explain why adults learn differently than other types of learners.

In an attempt to formulate a comprehensive adult learning theory, Malcolm Knowles, in 1973, published the book The Adult Learner: A Neglected Species. Building on the earlier work of Lindeman, Knowles asserted that adults require certain conditions to learn. He borrowed the term andragogy (and-rè-go´jê) to define and explain the conditions.

Knowles' theory of andragogy is an attempt to develop a theory specifically for adult learning. Knowles emphasizes that adults are self-directed and expect to take responsibility for decisions. Adult learning programs must accommodate this fundamental aspect.

Andragogy makes the following assumptions about the design of learning: (1) Adults need to know why they need to learn something (2) Adults need to learn experientially, (3) Adults approach learning as problem-solving, and (4) Adults learn best when the topic is of immediate value.

In practical terms, andragogy means that instruction for adults needs to focus more on the process and less on the content being taught. Strategies such as case studies, role playing, simulations, and self-evaluation are most useful. Instructors adopt a role of facilitator or resource rather than lecturer or grader.

Andragogy applies to any form of adult learning and has been used extensively in the design of organizational training programs (especially for "soft skill" domains such as management development).

Example: Knowles (1984, Appendix D)

Knowles provides an example of applying andragogy principles to the design of personal computer training:

1. There is a need to explain why specific things are being taught (e.g., certain commands, functions, operations, etc.)

2. Instruction should be task-oriented instead of memorization -- learning activities should be in the context of common tasks to be performed.

3. Instruction should take into account the wide range of different backgrounds of learners; learning materials and activities should allow for different levels/types of previous experience with computers.

4. Since adults are self-directed, instruction should allow learners to discover things for themselves, providing guidance and help when mistakes are made.

What are the differences between andragogy and pedagogy?

	Andragogy	**Pedagogy**
Demands of learning	Learner must balance life responsibilities with the demands of learning.	Learner can devote more time to the demands of learning because responsibilities are minimal.
Role of instructor	Learners are autonomous and self directed. Teachers guide the learners to their own knowledge rather than supplying them with facts.	Learners rely on the instructor to direct the learning. Fact based lecturing is often the mode of knowledge transmission.
Life experiences	Learners have a tremendous	Learners are building a

	Andragogy	Pedagogy
	amount of life experiences. They need to connect the learning to their knowledge base. They must recognize the value of the learning.	knowledge base and must be shown how their life experiences connect with the present learning.
Purpose for learning	Learners are goal oriented and know for what purpose they are learning new information	Learners often see no reason for taking a particular course. They just know they have to learn the information.
Permanence of learning	Learning is self-initiated and tends to last a long time.	Learning is compulsory and tends to disappear shortly after instruction.

Four keys to adult learning

- Let adults direct themselves in the instructional process
- Integrate new information with previous experiences
- Make sure the information is relevant
- Make sure the information is readily useable for the learner

Tips and Techniques for Teaching Adults

- Use problem oriented instruction. Case studies, simulations problem solving groups make the instruction relevant to their situation.
- Instruction should be about tasks not memorization of content.
- Instructors need to put their egos aside and not be afraid to have ideas and instruction challenged. Do not be afraid to give up control.
- Make the environment comfortable and leave time for breaks (every 45- 60 minutes).
- Instructors should use open ended questions to bring out the vast experiences of the adult learners.

"Our academic system has grown in reverse order. Subjects and teachers constitute the starting point, [learners] are secondary. In conventional education the [learner] is required to adjust himself to an established curriculum....Too much of learning consists of vicarious substitution of someone else's experience and

knowledge. Psychology teaches us that we learn what we do....Experience is the adult learner's living textbook."

- ***The Meaning of Adult Education*** by Eduard C. Lindeman

- **Feedback.** Effective feedback – from mentors, peers, or self – enhances achievement and learning. Actively seeking and giving feedback enables people who communicate to understand each other better and to engage in more meaningful interactions.
- Items of Feedback.
    - "How can we do better training our candidates?"
    - "How can we better understand what our candidates need?"
    - "How can our candidates better understand what we are asking of them?"
- "How can our candidates understand each other better when they work together in teams?"
- Elements of feedback:
    - How can you make feedback more effective?
    - How can feedback be utilized to improve the processes of training, learning, and communication;
    - How can feedback guide the use of equipment and technological tools.
- Keeping a feedback channel open in both directions. For candidate, feedback can originate from instructors/FTOs, other experienced officers and mentors, peers (other candidates), and of course one's self (e.g., self-reflection, intuition, physiological feedback). For instructors/FTOs, feedback can originate from students, peers (other officers), supervisors, self, as well as historical data from other FTO sessions. Depending on the situation, the list of sources can further expand to include truckers, civilian drivers, truck company representatives, legislatures or Federal agency representatives as part of a review process.

What Constitutes Effective Feedback? An important question related to that tradeoff is how to maximize the effectiveness of feedback while keeping its costs within reasonable limits. Below is a list of qualities that contribute to the effectiveness of feedback.

- *Allowed, welcomed by candidate*
- *Sensible, grounded, situated*.
- *Personalized*.
- *Perceptible, accommodating*.
- *Efficient, easy to access, sustainable*.
- *Robust.*
- *Open, inclusive*.
- *Unambiguous, clear, straightforward*.
- *Serious, non-distracting*
- *Unbiased, representative*
- *Palatable*.
- *Frequent.*

- *Well timed, just-in-time*
- *Measured, moderated*
- *Well intentioned, respectful*
- *Encouraging, positive*
- *Iterative*.

- Situational leadership [Blanchard et al. 1985] is an approach to people management which advocates training people by providing them with a type of feedback that depends on their latest competence and commitment levels for the work they do.
- Measuring each of the two qualities on a 'low/high' scale yields four possible groups of trainees and suggests four corresponding types of feedback: directing, coaching, supporting, and delegating. Each subsequent stage implies an increasing level of involvement on the part of a trainee in making decisions, and a decreasing dose of detailed suggestions and close scrutiny on the part of trainers.

- **Performance Improvement**

- One element seems to be at the core of successful leaders: they all work to add measurable value to associates, family, and our shared society. And this is a vital element in successful human performance improvement.
- Successful leaders, and those who would recover leadership status, all add societal value. And they do it formally, rigorously, and measurably.

- Leadership is about creating the future, and management is about making today operate. Success depends on making useful decisions.
- Do not assume that what worked in the past will work now. Get out of your comfort zone and be open to change. Ever been in a work or home relationship where you or others kept doing the same things over and over again? If you are not changing and adding measurable value to all, you are failing.
- Differentiate between ends (what) and means (how) and prepare all objectives to rigorously measure accomplishment. To be a leader, clearly define where you want to head and why? Be very clear, precise, and rigorous in defining the results you want.
-

Supervisory education

FTO training like any supervisory education encompasses a broad range of philosophies, techniques, and topics concerned with helping supervisors become more effective in their job. Supervisor education sometimes focuses on specific skills (e.g., inspections, apprehending a suspect), general abilities (e.g., communication, planning), or personal development (e.g., leadership, handling stress).

Theories of adult learning (e.g., Cross, Knowles, Rogers) that emphasize the importance of building upon the learner's experience are also very relevant to supervisory education. The experiential theory of Kolb (1984) suggests that the learning cycle consists of four

primary stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation. According to Kolb, individual differences in these stages give rise to learning styles.

The theoretical framework of action learning (Revans, 1980) has been widely applied to supervisory education. Action learning involves structured projects in organizations rather than traditional classroom instruction. The key elements of action learning are: commitment to learning, social interaction, action plans, and assessing the results of actions.

Creativity, and problem-solving are usually considered important topics in supervisory education (e.g., Roth, 1985). A major focus of is to teach supervisors how to be more flexible in solving problems. Decision-making is also a critical skill domain for supervisors.

Decision-making

From a practical point-of-view, one of the most important human skills is **decision-making** (judgement and choice). Both at a personal level, and in the context of organizations, decision-making skill strongly affects the quality of life and success. It is not surprising that the topic has received considerable study and is the subject of many different theoretical frameworks (e.g., Hammond, McClelland & Mumpower, 1980; Kaplan & Schwartz, 1975). Decision-making skill is fundamental to management education (see Bazerman, 1986; Huber, 1980).

A major focus of research on decision-making is the frequent departure from purely rational choices (e.g., Dawes, 1988; Kahneman, Slovic & Tversky, 1982). Indeed, Simon (1976) has made the case that "satisficing" (i.e., making a choice that is good enough) is the most common decision strategy. On the other hand, social psychologists look at decision-making as a matter of conflict resolution and avoidance behaviors due to situational factors (e.g., Janis & Mann, 1977). Rappoport & Summers (1973) discuss the role of probability and the limits to processing capacity in human judgement.

Most theories accept the idea that decision-making consists of a number of steps or stages such as: recognition, formulation, generation of alternatives, information search, selection, and action. Furthermore, it is well recognized that routine cognitive processes such as memory, reasoning, and concept formation play a primary role in decision-making. The study of attitudes, creativity, and problem-solving is closely associated with decision-making. In addition, decision-making behavior is affected (usually adversely) by anxiety and stress.

Adult learning theories (e.g., Cross , Knowles , Rogers) are relevant to decision-making because they emphasize the role of experience and personal strategies in learning. The double loop learning theory of Argyris is especially relevant to decision-making skills since it focuses on analysis of the assumptions and implicit rules underlying the learning process.

What is a Team?

A team is a group of people coming together to collaborate. This collaboration is to reach a shared goal or task for which they hold themselves mutually accountable. A group of people is not necessarily a team. A team is a group of people with a high degree of interdependence geared towards the achievement of a common goal or completion of a task rather than just a group for administrative convenience. A group, by definition, is a number of individuals having some unifying relationship.

Team members are deeply committed to each other's personal growth and success. That commitment usually transcends the team. A team outperforms a group and outperforms all reasonable expectations given to its individual members. That is, a team has a synergistic effect -- one plus one equals a lot more than two.

Team members not only cooperate in all aspects of their tasks and goals, they share in what are traditionally thought of as management functions, such as planning, organizing, setting performance goals, assessing the team's performance, developing their own strategies to manage change, and securing their own resources.

Team members need to believe the team has an urgent and worthwhile purpose. Establishing a sense of urgency and direction will help them know what their expectations are. The more urgent and meaningful the need to reach a goal, the more likely it is that a real team will start to emerge. The best teams define their performance expectations, but are flexible enough to allow changes to shape their own purpose, goals, and approach.

Leadership shows itself in the inspired action of team members. Traditionally, organizations have assessed leaders by their actions and behaviors. But, the best way to assess leadership is by the degree to which people surrounding leaders are inspired. It is this inspiration that leads organizations on to excellent performance, rather than mediocre performance.

Common Team Elements for a Leader

A team goal - Although your team might have a number of goals, one of them must stand out. For example, "To produce 10% more widgets than last year without hiring additional personnel." A supporting goal might be, "To provide 40 hours of yearly training for each member." Everyone must know, agree upon, and be committed to accomplishing the team goal.

Productive participation of all members - This has four levels:

1. Contributing data and knowledge
2. Sharing in the decision making process and reaching consensus
3. Making the decision
4. Making an imposed decision work

Communication - Open, honest, and effective exchange of information between members.

Trust - Openness in critiquing and trusting others.

A sense of belonging - Cohesiveness by being committed to an understood mandate and team identity.

Diversity - This must be valued as an asset. It is a vital ingredient that provides the synergistic effect of a team.

Creativity and risk taking - If no one individual fails, then risk taking becomes a lot easier.

Evaluation - The ability to self correct.

Change compatibility - Being flexible and assimilating change.

Participatory leadership - Everyone must help lead to one degree or another.

Socratic questions

Socrates was one of the greatest educators who taught by asking questions and thus drawing out (as 'ex duco', meaning to 'lead out', which is the root of 'education') answers from his pupils. Here are the six types of questions that Socrates asked his pupils. Probably often to their initial annoyance but more often to their ultimate delight. He was a man of remarkable integrity and his story makes for marvelous reading.

The overall purpose, by the way, is to challenge accuracy and completeness of thinking in a way that acts to move people towards their ultimate goal. Do not waste time by doing it for your own gratification. Get your kicks vicariously, from the movement you create.

Conceptual clarification questions

Get them to think more about what exactly they are asking or thinking about. Prove the concepts behind their argument. Basic 'tell me more' questions that get them to go deeper.

- *Why are you saying that?*
- *What exactly does this mean?*
- *How does this relate to what we have been talking about?*
- *What is the nature of ...?*
- *What do we already know about this?*
- *Can you give me an example?*
- *Are you saying ... or ... ?*
- *Can you rephrase that, please?*

Probing assumptions

Probing of assumptions makes them think about the presuppositions and unquestioned beliefs on which they are founding their argument. This is shaking the bedrock and should get them really going!

- *What else could we assume?*
- *You seem to be assuming ... ?*
- *How did you choose those assumptions?*
- *Please explain why/how ... ?*
- *How can you verify or disprove that assumption?*
- *What would happen if ... ?*
- *Do you agree or disagree with ... ?*

Probing rationale, reasons and evidence

When they give a rationale for their arguments, dig into that reasoning rather than assuming it is a given. People often use un-thought-through or weakly understood supports for their arguments.

- *Why is that happening?*
- *How do you know this?*
- *Show me ... ?*
- *Can you give me an example of that?*
- *What do you think causes ... ?*
- *What is the nature of this?*
- *Are these reasons good enough?*
- *Would it stand up in court?*
- *How might it be refuted?*
- *How can I be sure of what you are saying?*
- *Why is ... happening?*
- *Why? (keep asking it -- you'll never get past a few times)*
- *What evidence is there to support what you are saying?*
- *On what authority are you basing your argument?*

Probe implications and consequences

The argument that they give may have logical implications that can be forecast. Do these make sense? Are they desirable?

- *Then what would happen?*
- *What are the consequences of that assumption?*
- *How could ... be used to ... ?*
- *What are the implications of ... ?*
- *How does ... affect ... ?*
- *How does ... fit with what we learned before?*

- *Why is ... important?*
- *What is the best ... ? Why?*
-

Rubrics

In general a rubric is a scoring guide used in subjective assessments. A rubric implies that a rule defining the criteria of an assessment system is followed in evaluation. A rubric can be an explicit description of performance characteristics corresponding to a point on a rating scale. A scoring rubric makes explicit expected qualities of performance on a rating scale or the definition of a single scoring point on a scale

Rubrics are explicit schemes for classifying products or behaviors into categories that vary along a continuum. They can be used to classify virtually any product or behavior, such as essays, research reports, portfolios, works of art, recitals, oral presentations, performances, and group activities. Judgments can be self-assessments by students; or judgments can be made by others, such as faculty, other students, or field-work supervisors. Rubrics can be used to provide formative feedback to students, to grade students, and/or to assess programs.

Rubrics have many strengths:

- Complex products or behaviors can be examined efficiently.
- Developing a rubric helps to precisely define faculty expectations.
- Well-trained reviewers apply the same criteria and standards, so rubrics are useful for assessments involving multiple reviewers.
- Summaries of results can reveal patterns of student strengths and areas of concern.
- Rubrics are criterion-referenced, rather than norm-referenced. Raters ask, "Did the student meet the criteria for level 5 of the rubric?" rather than "How well did this student do compared to other students?" This is more compatible with cooperative and collaborative learning environments than competitive grading schemes and is essential when using rubrics for program assessment because you want to learn how well students have met your standards.
- Ratings can be done by students to assess their own work, or they can be done by others, such as peers, fieldwork supervisions, or faculty.

Developing a Rubric

It is often easier to adapt a rubric that someone else has created, but if you are starting from scratch, here are some steps that might make the task easier:

- Identify what you are assessing (e.g., critical thinking).
- Identify the characteristics of what you are assessing (e.g., appropriate use of evidence, recognition of logical fallacies).

- Describe the best work you could expect using these characteristics. This describes the top category.
- Describe the worst acceptable product using these characteristics. This describes the lowest acceptable category.
- Describe an unacceptable product. This describes the lowest category.
- Develop descriptions of intermediate-level products and assign them to intermediate categories. You might develop a scale that runs from 1 to 5 (unacceptable, marginal, acceptable, good, outstanding), 1 to 3 (novice, competent, exemplary), or any other set that is meaningful.
- Ask colleagues who were not involved in the rubric's development to apply it to some products or behaviors and revise as needed to eliminate ambiguities.

Telling Ain't Teaching

- Learning is unlike a transfusion of digested knowledge from instructor to students, and more like an actual digestion and construction of new knowledge inside the learner's brain [Piaget 1950, Bransford et al. 2000].
- While learning involves memorization – one of the lower level skills in Bloom's taxonomy [Bloom and Krathwohl 1984] – it is by far not limited to that. Other important outcomes of learning include the ability to apply the newly acquired knowledge, to transfer it from one domain to another, to organize the new ideas and connect them with previously known concepts, as well as to assess their value for a given purpose.
- The famous Learning Pyramid diagram [NTL 2005] illustrates the significant improvements in knowledge retention rates when students become actively engaged in the process of their learning: by teaching others / immediate use, by doing, or by group discussions, in contrast to the conventional practices of listening (to lectures in class) or reading.
- In some cases, the retention rates that result from applying active learning techniques are estimated to reach 90%, up from a mere 5%-10% in the case of employing the more passive traditional practices!
- *Experiential learning* rests on an appreciation of the crucial role of experience and experimentation in fostering learning. It is a two-step technique that starts with creating situations in which students discover (through reflection) that their current skills are insufficient and their existing mental models prevent them from accomplishing what they desire. Once this is achieved, the second step involves guiding the students by introducing new models that may allow them, with practice, to attain their goals [Socha et al. 2003a].
- A central theme in the works of many authors on the subject of learning (Kolb 1984, Chickering and Gamson 1987, Leonard 1992, Felder et al. 2000] is the idea that there are three essential components of learning: *doing* (practice, experience), *feedback* (consequences, responses, emotions), and *reflection* (thinking, analyzing), iteratively following one another albeit not always in this order of appearance.

- Another principle is that of a *learning community* [Mazur 1997, Bransford et al. 2000]. It encourages peer instruction and peer feedback, increases student motivation to succeed (in comparison to individual learning), and offers students a chance to practice their interpersonal skills. This also relates to the benefits of *collaborative learning*. Collaboration has been found to improve the learning outcomes relative to individual work [Johnson et al. 1998, Michaelsen et al. 2004]. Furthermore, collaboration reduces attrition and promotes positive attitudes, the effect of which increases with the frequency of students working together [Prince 2004].
- Often misunderstood in military and police training is *cooperative learning which* helps students to develop team skills, promotes interpersonal relationships, and fosters self-esteem. The underlying premise is that cooperation is more effective than competition in improving student learning. Key aspects that enable this positive effect are the "buddy system", individual accountability, and normal self-assessment of the way teams function [Prince 2004]. Many of these principles have direct equivalents in a other professional setting, such as surgical teams, Special Forces teams, business teams.

THE TRADITIONAL CLASSROOM AND THE CONTEMPORARY WORK ENVIRONMENT

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Office of the Chancellor for Community Colleges, University of Hawaii
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Traditional Classroom	Contemporary Work Environment
Instructor provides information and direction.	Employees need to solicit information and resources from supervisors and peers.
Students follow instructions and do only as they are instructed.	Projects are self initiated and managed.
Individual students follow procedures/processes to arrive at the "one" correct answer or solution.	Employees work in groups to solve problems.
There is one recognized way to do things -- the instructor's way.	Rational justifications for method(s) are acceptable.
Students use books as their primary source for information.	Co-workers and managers are primary resources.

Students complete assignments as instructed with timelines determined by the instructor.	Timelines are negotiated and set by employees and managers together.
Grades are determined by the instructor.	Assessments are qualitative and include input from individual employees, peers, supervisors, and work products.
Students are expected to listen and take notes in class. Questions are acceptable only to clarify what has been said.	Personal interest, participation, experimentation, and active questioning are major job components.
Group work is considered to be unfair.	Cooperative group skills are essential to getting things done.

Appendix H
Draft FTO Guide

Draft FTO Guide:

Introduction

As a Field Training Officer (FTO), you finalize the education of new FMCCO safety inspectors by providing the hands-on training so critical to their success on the job. In order to create successful safety inspectors, you must demonstrate thorough and accurate inspection procedures, procedure such as dealing with angry or frightened drivers, checking logbooks and vehicles, filling out forms, and completing reports. In addition, you must model excellent professional and interpersonal skills and provide encouragement and feedback to ensure your new recruits gain the skills, confidence and ability to perform as outstanding safety inspectors. Your role in training is vital. If you have not opened your Field Training Officer manual in a while, you may want to review it. It describes FTO duties and responsibilities, provides useful training information, and lays out not only your tasks but also those of the FTO Sergeant, the Field Office Commander, and the FTO Program Coordinator.

Note: Although this guide does NOT replace the Field Training Officer manual, it changes the emphasis to your role as a "trainer" rather than a teacher.

Purpose

The purpose of this guide is to assist you, the Field Training Officer, in improving the training of new recruits so that they become excellent safety inspectors who possess the skills, behaviors, and information they need to perform their jobs.

Background

Many experienced safety inspectors are reaching retirement age and FMCCO must replace them with recruits who are well trained and ready to work. This has caused FMCCO to review its teaching and training practices to ensure that classroom and field training are both effective and efficient and that all training is provided in an environment that encourages questions and cultivates confidence.

This background section discusses:

- FMCCO's need to improve training
- New online course
- Affect on field training

Need for Improved Training

Unfortunately, many new hires struggle with the classroom training due to the overwhelming number of rules and regulations they must understand. It does not help that exceptions exist for many regulations or that the writing style in the regulation handbook is complex. The failure rate, due to these obstacles, is unacceptable. Now that many seasoned FMCCO safety inspectors are retiring, the need to improve classroom training so that more recruits are successful has become a major goal. FMCCO requested an online training vehicle to support the new recruits and to supplement the classroom portion of training. It should also prove useful in field training and on the job.

New Online Course

Fortunately, the FMCCO Safety Inspector course now includes an online portion that is available to all safety inspectors. It was designed and developed for FMCCO's new hires (and anyone who wants to refresh knowledge) by a group at the University of Central Florida's Institute for Simulation and Training (IST). The online class includes charts, animations, examples and safety checks so trainees can check their understanding or review information any time they want.

To build this online course, IST gathered input and support from Safety Inspector Subject Matter Experts who worked long hours to find or take photographs, provide feedback, point out errors, or add content. Extensive planning and review meetings took place to design and then develop the online training. After two evaluative pilots of the course, statistics indicate significantly higher test scores during the first four weeks of classroom training and a significantly higher success rate overall.

No one has yet measured the impact of the online course on field training. If you notice that your new recruits are better prepared than were past recruits, be sure to let FMCCO know because this indicates the changes to the training schedule and the new online course have also helped with field training.

Field Training

To summarize the duties listed in the Field Training Officer manual, pages 12-16, you have 19 functions to perform that help prepare successful Safety Inspectors. In addition to training, supervising, and counseling, you must keep up your own set of skills. You must create a working environment for your recruits that is efficient, respectful, and supportive. You will provide opportunities for job shadowing, demonstrate what to do at a court appearance, how to talk to drivers, cues and clues to watch for as you scrutinize trucks on the highway, and so much else. If you have a list that helped you when you first joined the department, share it with the recruits or recommend they make their own lists.

After you review the Field Training Officer manual, try to remember what you knew and how you felt when you began your own field training. Also, remember to rely on or develop a sense of humor and lots of patience.

Your recruits are learning more from you than you realize. They will develop their inspection style, behavior, and even feelings about the organization from you. Make sure to communicate fully with recruits. As you make decisions about the trucks you choose to inspect or the questions you ask drivers, tell the recruit what you are looking for, what you think you saw, and what you hope to accomplish.

Note: Do not forget to remind the recruit of all the helpful items created to assist them. Look at Appendix A for a thorough list.

Objectives

Once you have reviewed the Field Training Officer manual and this FTO guide, you should be able to:

1. Enumerate a list of key training principles and apply them as you train
2. Evaluate the trainee's performance using a new evaluation form

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Key Training Principles

Page 20 in your Field Training Officer manual lists some common sense guidelines to follow when you begin training; pages 12-16 discuss your responsibilities as a training officer. You will supervise and counsel, model attitudes and behaviors, demonstrate courteousness, and so forth. In addition, field training must incorporate:

- Principles of adult learning
- Performance-based training practices
- Excellent interpersonal skills
- Methods to resolve conflict

Principles of Adult Learning

Adult learning (andragogy) is a field that studies how adults learn. In 1973, Malcolm Knowles (eminent scholar in the field of adult learning) published his findings. (M. Knowles, 1973). Knowles pointed out that adults learn differently than children do. Adults are *self-directed* about how and what they learn and, in addition, they *take responsibility* for learning decisions they make. Adult training materials that ignore these facts will not be useful to learners and may actually offend them.

Keep the above two issues in mind when designing learning materials for adults. Also understand that adults:

1. Prefer learning when the topic is of immediate value
2. Demand to know why they need to learn something—how is this relevant
3. Learn through experience—how does this new task connect to other tasks or information learners already perform or know
4. Approach learning as problem-solving

Immediate Value

The circumstances of field training with a person poised to become a Safety Inspector more than meets the immediacy requirement. The recruits understand that the information and skills you pass on to them and model for them are of immediate value.

Relevance

The field training you provide has absolute relevance and the recruits know it. However, as an FTO, you realize you must show recruits “how” to do the job and that they will ask many interesting questions. “Why do you do it that way? Why do I need to know that?” If you identify parts of an air brake system or describe how air moves through the brake lines, be prepared to contextualize situations that will require recruits to use that information on the job.

Experiences

Adults try to attach new information and tasks to prior knowledge and experiences to help them learn. As an FTO, you need to discover these experiences, successes, achievements and weaknesses to determine the way you present training. For example, if you have a recruit that used to be a police officer, you may not need to spend much time discussing how to interview drivers or how to take safety precautions if you pull a driver over on the highway.

Some recruits, of course, will not have this background but they may have been truck drivers or mechanics and will understand other concepts. Some may be fresh out of college, having only the academy training but may have clear thinking and

logic skills. It is your job to adapt your training style to each recruit's level of experience.

Problem Solving

Adult learners gain knowledge and retain it when they approach an area of learning as a problem that needs solving. In order to perform a brake inspection correctly, for example, recruits may lay out steps, such as remembering the regulation numbers that deal with brakes. Then, they may break up tasks into items to check in the dash, with driver assistance, and things to check under the truck. They may decide that solving the problem (does this vehicle deserve a certificate) might include building a "cheat sheet" with notes, regulation numbers, and the list of items that could be out-of-service or critical violation issues. They may list things to check first and note that they can stop once they have discovered 20% of brakes have problems.

In summary, when you begin to train a new recruit, make sure your style supports adult learners. Base training on performance and keep the following principles of adult learning (andragogy) in mind:

1. Adult learners want to direct their own learning and will take responsibility for it
2. Adult learners demand training that is relevant and immediately useful
3. Adult learners bring life experiences to new tasks and will try to connect new information and new tasks with these experiences
4. Adult learners apply problem-solving strategies to assist in learning.

Performance-based Training Practices

Field training is performance-based training. The recruits bring their academy training, which includes some hands-on demonstrations and access to a new online course, and you provide the opportunity and guidance they need to practice the tasks they will eventually perform.

With support, guidance, feedback, encouragement, and lots of practice, you lead them toward success in the tasks they undertake.

Research has shown that case studies, role-playing, simulations, and self-evaluation provide performance-based methods that also match adult learning styles. In order to work as a mentor, trainer and guide instead of a lecturer or teacher, you can round out performance-based training by trying some of the following adult learning strategies.

Case studies: In Appendix B, we have gathered a few case studies that you can assign to or discuss with your trainee. If you have strong memories of situations that you encountered that confounded you, be sure to describe them.

Role-playing: If you do not already do this during training, try it. Assume the role of an uncooperative driver to let your recruit practice conflict resolution skills. Argue about having your truck put out of service. Challenge the law or regulation.

Simulation: The fact that you are training in the field provides many opportunities to simulate an actual inspection or an on-the-road assignment.

Self-evaluation: At appropriate times, ask the recruit how he/she feels about an accomplishment. For example, did the recruit feel comfortable while inspecting the tires? Does he/she need to review a topic or re-watch an inspection? Recommend that recruits keep a "diary" to help them improve their skills. They may want to log errors, set goals, itemize problems and successes, and compose questions.

Interpersonal Skills

In discussing the 19 roles you play in training new recruits, your Field Training Officer manual reminds you to model professional behavior at all times, including grooming, communicating, listening, managing time, and assuming responsibility for your recruit. You are responsible for providing an environment for learning that is as stress free as possible, even during evaluation periods. You must determine recruits' learning gaps by asking good questions; you must notice clues about experiences so your training corresponds with experiences. You may want to find information to help recruits with some aspect of the job.

In addition to these skills, do not forget to help recruits develop decision-making and problem-solving skills. Find or simulate situations that are complex with no obvious right or wrong answer. Discuss these "gray" areas and offer some strategies to help recruits make an informed decision.

Refer to Appendix C for additional information about interpersonal and career skills and the behaviors associated with each skill.

Conflict Resolution

Being able to resolve conflicts in a professional and safe manner requires recruits to maintain a calm demeanor, speak respectfully, understand the potential for big problems, develop excellent leadership traits, "read" a driver, have a back-up plan when all else fails, and so forth. Your responsibility as the trainer is to provide situations that allow recruits to practice resolving conflicts until you feel that recruits can handle most situations and have a strategy for conflicts that escalate.

During an inspection, conflicts arise for a variety of reasons. Many arise due to attitudes or behaviors of both the driver and the safety inspector. In addition, delivery deadlines tied to a driver's pay may make it difficult for a driver to stay composed or the safety inspector may be disturbed due to witnessing a driver's erratic driving or obvious safety violations with the vehicle.

As the trainer, you may want to compose a list of situations that typically are stressful and run through the list with recruits, describing actual events, what happened, and how the conflict ended. Do some role-playing with recruits, switching roles. Seasoned safety inspectors have handled many distressed, frightened, exhausted, and angry drivers; new recruits must demonstrate they too can adapt their behavior to the situation.

Do not forget to describe the characteristics and traits possessed by safety inspectors that seem to work well to dissipate conflict as well as those whose behaviors make situations worse.

Evaluation Form

A new evaluation form (available online at fmcco.rapter.ist.ucf.edu) helps standardize the way you assess skill performance of new recruits. You will no longer rank performance on a scale; instead, you check yes or no to indicate if recruits performed the task. Obviously, some recruits will perform tasks efficiently and easily

whereas others may go about it in ways that seem illogical, running back and forth, scratching their heads and getting themselves all confused. In the end, however, if both successfully applied out-of-service regulations, check “Yes” but provide extremely helpful feedback to recruits who stumble. In cases that you know you directed too much of the performance, check “No”. Your goal is to ensure that recruits perform their jobs successfully. If you have doubts for a recruit, provide detailed feedback to and consider remediation tasks.

Appendix A:
FMCCO List of Training Material

1. Federal Regulations http://www.fmcsa.dot.gov/
2. Web-based Safety Inspector Training and Certification Program http://fmcco.rapter.ist.ucf.edu/
3. North American Standard Out-of-Service Criteria
4. FTO Evaluation Form

Appendix B:
Professional Skills

1. **Behavior Management**
   Meets deadlines, uses materials wisely, and controls behaviors to enhance productivity and improve interpersonal relations.
   - Uses time wisely so that tasks are completed in a timely way
   - Uses help materials wisely and knows where to look for assistance
   - Monitors behaviors so that performance is enhanced
   - Manages behaviors toward others to mitigate conflict and improve compliance
   - Demonstrates flexibility in dealing with change

2. **Communication**
   Comprehends spoken message and takes actions to demonstrate understanding; listens for understanding, asks for clarification; speaks appropriately to audience
   - Follows verbal directions accurately to accomplish tasks
   - Asks questions to clarify and confirm understanding
   - Analyzes situations and audience when speaking—choose appropriate tone, words, actions to bring about desired result

3. **Teamwork**
   Works cooperatively with others to achieve a mutual goal
   - Contributes ideas to help team/organization achieve goals or complete tasks
   - Shares and assists with work load

4. **Problem Solving and Decision Making**
   Recognizes problems, plans solutions, follows through, adjusts as necessary
   - Deliberates, investigates, and considers options and consequences to solve problems
   - Asks questions to help understand the problem
   - Adjusts thinking and behavior when encountering unforeseen problems
   - Works to find solutions, implements solutions, evaluates results of decisions and adjusts/corrects when necessary

5. **Leadership**
   Demonstrates commitment to a cause or a goal and motivates others so that they also commit to a cause or goal
   - Supports causes that benefit the organization, society and others
   - Comports self with personal dignity and integrity

- Motivates others by example or by directing actions

6. <u>Creative Thinking</u>
Generates new ideas or possible solutions to solve problems, improve performance, or broaden a view

- During discussions, provides a variety of innovative approaches or strategies that might improve job performance

7. <u>Work Ethics</u>
Demonstrates empathy for others; recognizes and does the right thing

- Performs tasks and actions according to the law
- Follows organization's rules and regulations
- Follows rules and procedures with and without supervision
- Demonstrates a positive attitude toward work
- Takes responsibility for errors and new learning
- Notices and helps if others have problems