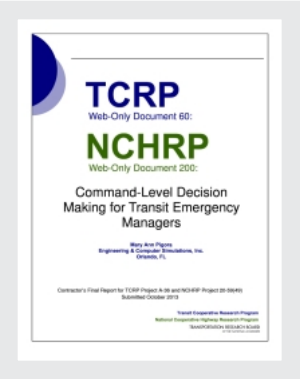

Command-Level Decision Making for Transit Emergency Managers

DETAILS

0 pages | 8.5 x 11 | PAPERBACK
ISBN 978-0-309-43382-2 | DOI 10.17226/22463

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ACKNOWLEDGMENT

This work was sponsored by the Federal Transit Administration (FTA) in cooperation with the Transit Development Corporation and the American Administration of State Highway and Transportation Officials (AASHTO), in cooperation with the Federal Highway Administration. It was conducted through the Transit Cooperative Research Program (TCRP) and the National Cooperative Highway Research Program (NCHRP), which is administered by the Transportation Research Board (TRB) of the National Academies.

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The work reported herein was performed under TCRP A-36 by Engineering and Computer Simulations, Inc. ECS is the contractor for this study, with the Faith Group, LLC serving as subject-matter experts.

Ms. Mary Ann Pigora is the Principal Investigator and the primary author of this report.

ABSTRACT

This report documents all phases of the “Command-Level Decision Making for Transit Emergency Managers” project. The goal of this project was to develop a Transit Emergency Response Application (TERA) that accurately trains transit command-level decision makers through simulation guided experiential learning. Simulated guided experiential learning provides gradual and consistent guidance while using a blend of instructional strategies to aid learners in achieving expert performance. TERA provides training and exercise for command-level roles in the transit agency emergency operations center in relation to mitigating transit-specific emergencies and supporting state and local emergency management authorities in natural or manmade disaster incidents.

CHAPTER 1: INTRODUCTION

1.1 Executive Summary

This report describes all phases of work for the "Command-Level Decision Making for Transit Emergency Managers" project, resulting in the implementation of the Transit Emergency Response Application (TERA). The work described in this document fulfills Tasks 1 to 15 as outlined in the TCRP project A-36 approved research plan. These tasks include a training needs analysis, development of terminal and enabling learning objectives, field testing of the prototype system, and implementation of the release system with six scenarios.

1.2 Background

Tragic events such as the terrorist attacks of 9/11 and Hurricane Katrina have shown that a critical element of a successful response is the ability for public and private transit agencies to work as coordinated teams with leading counterpart local, state, and federal emergency response organizations. The National Response Framework (U.S. Department of Homeland Security, rev. 2010, http://www.fema.gov/national-response-framework) provides a scalable, flexible, and adaptable framework for coordinating agencies such as transportation agencies to align key roles and responsibilities as they manage incidents from local events up to large-scale terrorist attacks or catastrophic natural disasters. The national framework calls for cooperation and understanding between local communities, tribes, states, the Federal Government, and the private sector as they strive to achieve shared goals. Moreover, outlined in the National Response Framework is the Incident Command System (ICS) which is a standardized, all-hazards incident management approach for integrating facilities, equipment, personnel, procedures, and communications operating within a common organizational structure, enabling coordinated response among various jurisdictions and functional agencies, both public and private, and establishing common processes for planning and managing resources. During an emergency, each responding agency is responsible for developing the capabilities needed for a timely and effective response by making assessments, and providing resources and information. In order for transit agencies to be prepared for unexpected incidents or emergencies, realistic and consistent training must be offered to personnel before and after an event. Effective response as described in this framework prefaces itself upon well-trained leaders and responders who have developed engaged partnerships and are able to achieve shared objectives. The aim of the "Command-Level Decision Making for Emergency Managers" project was to develop a Transit Emergency Response Application (TERA) to achieve the goals as outlined in the National Response Framework through simulation guided experiential learning. TERA provides training and exercise for command-level roles in the transit agency emergency operations center in relation to mitigating transit-specific emergencies and supporting state and local emergency management authorities in natural or manmade disaster incidents.

1.3 Research Objectives

During Phase I (Tasks 1 to 5), we achieved the following objectives:

- Wrote a Training Needs Analysis report that
  - identified the transit concentration areas (transit mode and/or mean)
  - identified primary transit agency command-level decision making roles
  - identified the primary functions of transit agencies (primary behavioral functions)
  - identified primary cognitive functions and associated processes of transit agency command-level decision makers
  - identified prerequisite knowledge and supplemental training individuals should receive prior to engaging in a TERA exercise
  - incorporated the TCRP review panel's feedback/guidance and data from follow-up interviews from Tier One transit cities

- Wrote role-based learning objective profiles that
  - identified and described the terminal and enabling outcomes
  - identified the tasks, conditions, standards, and expected actions
  - identified and applied instructional strategies and performance measures for each enabling outcome

- Wrote a scenario timeline that

  - identified and outlined the prototype structure of major events and time segments
  - identified and documented the progression and simulated content and injects that drive the storyline

- Wrote prioritized list of potential TERA scenarios that
  - identified and categorized story types as natural or manmade disasters with task functions
  - identified and discussed the scenario's applicability issues to transit emergency management

During Phase II (Tasks 7 to 9), we achieved the following objectives:

- Developed storyboards and facilitator/user guides
  - Developed draft facilitator and user guides. These guides were submitted for review and are also available at http://www.trb.org/Main/Blurbs/169839.aspx.
  - Wrote high-level outlines for all six scenarios as identified in Phase I (see Appendix A) that describe details such as plot summary, various service disruptions, and transit authority tasks.
  - Wrote storyboards for software engineers to translate and transfer instructional content such as inject type and content, time, incoming and outgoing recipients, response feedback, and consequences into TERA.

- Developed a prototype module
  - Identified and implemented artifacts such as video clips (e.g. TV news), email attachments, forms, and website news articles to support immersion in the prototype (flood with hazardous materials) scenario. The tasks exercised by this scenario are listed in Appendix E. All artifacts and injects are detailed in Appendix F.
  - Performed internal quality control checks which included scenario test runs and inject timing adjustments.
  - Released the prototype to the TERA portal at tera.train-emst.com.

- Performed field testing of the prototype module
  - Conducted field tests at three different transit agencies.
  - Evaluated and documented participant reactions concerning usability of the system, content realism and accuracy, and training effectiveness.

During Phase III (Tasks 12 to 15), we achieved the following objectives:

- Developed the scenario-based training system
  - Implemented the remaining five TERA scenarios on the latest baseline of the core platform including simulated multiple communications media such as phone, email, websites, television, fax, bulletins, forms, and face-to-face interactions.
  - Added any specialized user interface components necessary to simulate the work flow of a transit emergency operations center that is relevant to critical incident management.
  - Conducted a final field test to generate a Kirkpatrick Level 2 evaluation with pre- and post-testing that focuses on participants' ability to meet learning objectives.

- Executed Test Plan
  - Executed the Internal (Beta) Test Plan on the beta release candidate to include automated scenario runs, inject acceptance tests, component acceptance test, assessment acceptance test, and browser compatibility acceptance test.
  - Delivered the completed Internal Test Plan to the TCRP as part of our quality assurance process.

- Resolved Issues Identified through Tests

  - Addressed all software issues by documenting them in an external test document and verifying fixes through confirmation by test personnel.
  - Released the final software package for delivery when all issues were resolved.

- Prepared and Submitted Final Report
  - Wrote and submitted a final report that documents all three phases of the TERA project. The final report details the overall scope and goals for the project and research plan for each task including the background, objectives, research methods, results, and benefits of TERA.

CHAPTER 2: RESEARCH APPROACH

Phase I Research

2.1 Participants

ECS along with our partners at the Faith Group conducted several in-person and telephonic interviews with participants representing both Tier One and Two transit cities who have experience responding to multi-agency emergencies as a representative of local or regional transit authorities. We conducted 7 in-person interviews at privately owned transit agencies located in Orlando, FL and Washington, D.C. Additionally, we conducted five interviews by telephone with public transit agencies located in Orange and Sacramento counties, CA, Portland, OR, Washington D.C., and Chicago, IL. We also contacted California State and Washington County, OR Emergency Management officials to discuss their interaction with transit agencies during large scale events. Participants included two current Senior Directors of Safety and Security for Transit Operations, three transit Planning Managers, a Transportation Supervisor, a Maintenance Supervisor, and Director of Emergency Management.

2.2 Procedure

We conducted the Training Needs Analysis by interviewing incident management experts from the local and regional transit agencies focusing on the ability of public and private transportation authorities to work with local, state, and federal emergency response organizations when responding to crisis incidents. We used this information to identify concentration areas for transit and their associated command-level roles, primary transit agency functions, cognitive processes of transit agency command-level decision makers, and the prerequisite knowledge and supplemental training individuals should receive prior to engaging in a TERA exercise. We created interview guides using Cognitive and Behavioral Task Analysis methodologies with focus on the critical decisions and tasks present during emergencies. We interviewed subject-matter experts (SMEs) about specific multi-agency incidents in which they faced decision challenges and struggled to understand and/or resolve crises. Interviews also focused on identifying prerequisite training relevant to responding to emergencies. In addition to conducting interviews, we conducted a literature review of relevant emergency response doctrine such as the National Response Framework document (Feb. 2010), Incident Management Handbook (FEMA B-761), and training courses developed by FEMA's Emergency Management Institute.

2.3 Analysis

To begin analysis, we developed a list of transit areas and primary command-level transit emergency operations center roles revealed from the data (see Table 1 in Findings). We then compared the primary roles with existing ICS competencies. Next, we developed profiles for each command-level role in an IC fashion (see Appendix B) outlining the primary and alternate role titles, general duties, and general competencies required during each phase of an emergency incident; activation, operation, and demobilization phases. To examine the cognitive and behavioral tasks, we used spreadsheets to organize and categorize the data into each primary and secondary task categories with each row containing data from one interview. We then placed information that matched a category definition into the appropriate cell. Not only did this method provide real-world information and experiences that matched each role, it allowed us to gauge the amount of information in each category, by participant and by comment. We then expanded the categories with further information into decision requirements tables (DRTs). The DRT categories were task/decision, why difficult, cues/factors, strategies, and novice errors.

Phase II Research

2.4 Field Test Overview

During Phase II, ECS along with our partners at the Faith Group developed a prototype of the target system and conducted three field tests with participants from transit agencies who have experience responding to multi-agency emergency disasters. The intent of field testing was to elicit both written and verbal feedback on the system usability, realism and accuracy of the instructional content, and training effectiveness. The three field tests, each lasting 4 hours, were conducted at the following locations:

- Field Test 1 – Lynx Transportation, Orlando, FL. The field test was facilitated by Mary Ann Pigora, Jeff Sestokas, Matt Baker, and John Whitsell of Engineering & Computer Simulations. The TCRP panel observers were Dr. Yuko Nakanishi, Winslow Powell, and Anthony Tisdale. There were four field testers that participated with an average of 9.875 years of experience in emergency management and response operations.

- Field Test 2 –Tri-Met, Portland, OR. The field test was facilitated by Jeff Sestokas and Matt Baker of Engineering & Computer Simulations. The TCRP panel observer was Michael McGuire. There were four field testers that participated with an average of 4.6 years of experience in emergency management and response operations.

- Field Test 3 –Regional Transportation District (RTD), Denver, CO. The field test was facilitated by Jeff Sestokas and Matt Baker of Engineering & Computer Simulations and Heidi Benamen and Jeff Georgevich of Faith Group. The TCRP panel observers were Kevin Amberg and Allen Smith. There were four field testers that participated with an average of 18.75 years of experience in emergency management and response operations.

Weeks prior to each field test, an information sheet (see Appendix D of the contractor's final report) was provided to volunteer transit agencies that described test requirements including project background, purpose, schedule of activities, and support requirements including participant types and hardware and software specifications. Before conducting an exercise, facilitators arrived early at the site to perform hardware and software tests to ensure the TERA system was fully operational and to mitigate any potential risks and unforeseen needs. The day of the field test, introductions were given and then participants were instructed to run through a generic simulation tutorial to familiarize themselves with the interface functions and features before proceeding to the 2 hour full exercise. After the field test, a hot wash was conducted by facilitators asking participants questions related to the exercise and their experience using the system. Following the hot wash, participants completed evaluations which are summarized in the Findings section along with evaluation data reports shown in Appendix F of the contractor's final report.

Phase III Research

2.5 Implementation and Deployment

Phase III concentrated on implementation and deployment of the six release scenarios. Two of these scenarios were introduced to a national transit audience at the 2012 Transportation Hazards and Security Summit and Peer Exchange. TERA served as one of the primary training events during the exercise day on 22 August 2012.

To guide the Security Summit exercise operation, the following goals were established:

1. Establish and support an exhibit booth to explain TERA and its capabilities to all summit attendees.
2. Facilitate individual and collaborative exercises to capture training requests.
3. Provide extensive detail on TERA so users are able to elaborate upon the training tool with their respective organization following the summit.
4. Elaborate on the future of TERA to summit attendees to guide future expectations.

Two modifications were defined to expand TERA for training and exercise of additional Department of Transportation (DOT) personnel, and to support distribution and integration of TERA into local exercise plans. In Modification 1, we added a DOT role to two existing TERA scenarios and conducted one-on-one overview webinars, three on-site exercises, and a large scale exercise event at the 2012 Transportation Hazards and Security Summit and Peer Exchange.

The objective for Modification 2 is to provide training support for state departments of transportation wishing to utilize TERA, and a Train-the-Trainer session at the Transportation Hazards and Security Summit and Peer Exchange being held in 2013.

Task M2.1: Customize scenario for DOT. At the start of this modification, TERA contained two scenarios with a DOT Representative role. To ensure relevant content for state DOT exercises, one of these scenarios, the Flood, was expanded to exercise roles within the DOT emergency operations center.

Task M2.2: Ten Onsite Exercises. ECS will conduct on-site facilitated exercises for ten state DOT organizations. ECS will provide one facilitator for 2 days of on-site support. The first day is setup and one-on-one train-the-trainer instruction. The second day is an on-site exercise, with up to ten participants. DOT personnel will practice the role of facilitator with ECS personnel in support.

Task M2.3: Three TERA Webinars. ECS will hold a series of webinars for DOT personnel who are interested in utilizing TERA. Each webinar will cover TERA functionality and how to run an exercise, and will provide personnel with links to further references and tutorials. To allow interaction and questions from the participants, each webinar will be capped at twenty DOT attendees.

Task M2.4: 2013 Transportation Hazards and Security Summit Train-the-Trainer Session. ECS conducted a full day Train-the-Trainer course at the Transportation Hazards and Security Summit and Peer Exchange on 1923 August in Irvine, CA.

CHAPTER 3: FINDINGS

Phase I Findings

3.1 Training Needs Analysis

The interview data and literature review revealed the individual knowledge and skills critical for effective transit command-level decision making in rapidly developing emergency incidents, and differentiated the critical tasks and skills required for each role. From the data collected, we identified five concentration areas in ground transit emergency response (see Table 1). Additionally, the data revealed four primary command-level roles relevant across all five transit concentration areas. These primary roles mirror ICS operations center roles and include the Transit Emergency Manager who is responsible for the overall strategic command of the emergency response effort, the Transit Operations Coordinator who is responsible for managing the tactical functions such as coordination with field operators, etc., the Transit Planning Coordinator who is responsible for the collection, evaluation, forecasting, dissemination, and use of the information about the emergency incident and status of resources, and finally the Transit Logistics Coordinator who is responsible for managing logistical support such as personnel, vehicles, equipment, and supplies. During an incident, these roles work within the transit emergency operations center and coordinate with Emergency Support Function (ESF) 1 (Transportation) based in a local or state emergency operations center. Detailed profiles for each of these roles can be found in Appendix B of this report.

Table 1: Transit Concentration Areas and Their Associated Command-Level Roles

Transit Concentration Area	Command-Level Role *(See Appendix B for Detailed Profiles)*
1. Buses (Public and Private)	▪ **Transit Emergency Manager** ▪ **Transit Operations Coordinator** ▪ **Transit Planning Coordinator** ▪ **Transit Logistics Coordinator**
2. Railways (Heavy, Light, Commuter Rails)	
3. Bridges, Roads and Highways	
4. Tunnels (Above and Below Ground)	
5. Maritime (Cruise Ships, Ferries, etc.)	

In addition to identifying the concentration areas and transit command-level roles, the data also revealed five primary functions that transit agencies often must achieve during an emergency. These emergency response functions were then categorized between regular and emergency services. Moreover, these functions will help inform and drive the design and development of the learning objectives (Task 3).

Table 2: Primary Task Functions of Transit Agencies with Associated Service Types

Transit Emergency Response Function	Regular Service	Emergency Service
1. Life Safety		X
2. Property Conservation		X
3. Evacuate or move people “quickly and efficiently”	X	X
4. Move responders into and out of the areas		X
5. Provide Resources (offering additional routes, increased service clearing roads, highway/roadway or waterway accessibility, etc.)	X	X

The data also revealed three high-level cognitive processes that transit agency decision makers must perform during emergencies. A cognitive process is a series of interdependent actions executed during multi-agency response to an emergency. These actions form an evolving response pattern aimed at resolving the crisis. Through these actions, it is possible to employ, maintain, and revise plans. These processes involve activities such as leveraging previously established relationships with other transportation authorities, establishing morale, and establishing internal communication and information flows that promote effective multi-agency (public and private) transit response. As described below, there are three main cognitive processes which include: Develop Situation Awareness, Synchronize Information and Resources, and Execute Actions and Decisions.

- **Develop Situation Awareness**
  - Identify, gather, and prioritize information to understand the situation: Effective transit agency command-level decision makers are able to determine quickly how and where to identify, gather, and prioritize information necessary to take action regardless of transportation mean or mode (buses, roads, bridges, boats, etc.).
  - Recognize context of the situation and predict future needs: Effective transit agency command-level decision makers are able to construct a coherent picture of unfolding events and see the overarching implications and potential public needs of possible actions.
- **Synchronize Information and Resources**
  - Coordinate and communicate internally and externally: Effective transit agency command-level decision makers are able to collaborate internally and with outside agencies to gain resources to achieve mission goals and objectives. For example, if the evacuation need calls for 10,000 people to be moved to a safe location and additional buses are required, then a public agency may coordinate with private transit agencies to acquired additional vehicles.
  - Acquire, prioritize and allocate available assets to meet the transit needs of the public: Effective transit agency command-level decision makers are able to assess and meet transit needs of the public. For instance, this function may entail calculating the number of people who need to be moved with the number of available resources.
- **Execute Actions and Decisions**
  - Recognize decision points: Effective transit agency command-level decision makers are able to recognize decision points during a crisis and take action quickly. For example, a Transit Emergency Manager and/or Transit Operations Coordinator can make a decision to stop or interrupt services if presented with a critical situation or if there is a significant public need.
  - Maintain mission priorities: Effective transit agency command-level decision makers are able to recognize their primary mission which is to protect human life by quickly and efficiently moving people and providing resources.

Finally, we also identified several prerequisite training courses that transit command-level decision makers should take prior to participating in a TERA exercise. These training courses include ICS 100, 200, 300, 400, 700, and IC-801 Transportation (see Appendix L for prerequisite online training outlines relating to each recommended course).

3.2 Learning Objectives

Based on findings revealed in the Training Needs Analysis (Tasks 1 and 2), terminal and enabling learning objectives were designed for each identified role, incident phase (red=activation phase, blue=operations phase, and black=demobilization phase), and performance tasks (see Appendices D1-4 of the Phase I report). The terminal learning objectives describe the major intended outcomes expected from learners while performing tasks within TERA. To clearly and concisely communicate how learners will achieve intended outcomes, we wrote enabling learning objectives that describe precisely how the terminal objectives would be achieved. The enabling learning objectives were then categorized by learning level in accordance to Bloom's Taxonomy (Bloom, B.S., M.D. Englehard, E.J. Furst, W.H. Hill, and D.R. Krathwhol, Taxonomy of education objectives: the classification of educational goals, Longmans, Green, New York, 1956) and then matched with an appropriate TERA system strategy or function (e.g. send an email or call using the address book). Finally, performance measures in the form of time increments were paired with the enabling learning objectives to indicate the duration learners would have to achieve a task. To adhere to sound Instructional Design practices, we also segmented the Tasks, Conditions, Standards, and Expected Actions.

- **Task(s)** are descriptions of action(s) learners will perform.
- **Condition(s)** are criteria for measuring how the tasks will be performed.
- **Standard(s)** are guidelines for how the tasks should be performed.
- **Expected Action(s)** are the anticipated task performance activity.

After writing the learning objectives, system strategies, and performance measures, we then compared them to the HSEEP Exercise and Evaluation Guidelines which specifies evaluation criteria and standards for the mirrored ICS capabilities. The comparative analysis helped us to verify the evaluation requirements needed to train and assess the learning objectives.

3.3 Scenario Timeline

After creating the learning objectives, we developed a prototype scenario timeline (see Appendix E) that outlines and represents the major events and time segments. The scenario timeline also formed the general situation by presenting background information and broad event descriptions that clarifies who, what, where, why, when, and how for each simulated inject or stimulus. Simulated injects or stimulus are the driving components of TERA and will assist learners while performing tasks. For each simulated inject, we applied and documented several instructional design requirements to include:

- ***Inject Type:*** What form of communication or information will the inject take? While operating in simulated environments, injects can take many communicative or information-based forms such as emails, phone calls, faxes, live conversations, video news reports, etc.
- ***Time:*** At what occurrence on the timeline will inject(s) appear?
- ***Inject Content:*** What information or material(s) make up the simulated inject or stimulus?
- ***Incoming and Outgoing Recipient(s):*** Who will the information be conveyed to and from?
- ***Response(s)/Feedback:*** What are the standards response(s) to the inject(s) and/or stimuli?
- ***Performance Standard:*** What are the approximate expected actions of the learner to the task in question?
- ***Consequences:*** What are the positive and negative outcomes for completing or not completing the task?

3.4 Scenario Recommendations

During Phase I, we surveyed a variety of sources to find candidate emergency management exercise scenarios to be developed for TERA. Surveyed sources include the TCRP panel-recommended scenarios for this project, the National Planning Scenarios (http://www.fema.gov/pdf/media/factsheets/2009/npd_natl_plan_scenario.pdf), transit emergency management doctrine, and existing exercise systems. We specifically included the list of scenarios implemented in the base Emergency Management Staff Trainer (EMST) system to determine if these scenarios could be expanded to include transit command-level training roles. Expanding these scenarios would provide increased value by providing both transit-specific exercises and collaborative training with other emergency agencies.

The scenarios from the survey were entered into a spreadsheet and duplicates, scenarios not widely applicable to transit, and entries that were consequences rather than scenarios were marked. Commonly, emergency management scenarios are divided into Chemical, Biological, Radiological, Nuclear, Explosive (CBRNE) and Natural Disaster categories. In surveying the candidate scenarios, there were very few applicable nuclear or radiological scenarios, and the normal all-hazards categories as defined by the National Planning Scenarios did not encompass all candidates. We decided, therefore, to modify the categories to be terrorism based (CBRNE, physical attacks, hostage situations), natural disaster, or accident.

For each scenario, we noted the primary task functions for each (drawn from the Training Needs Analysis), and any differentiators for those task's functions. For example, many scenarios required property conservation, but only some required large scale assessment of structural integrity of assets such as bridges or stations. Others required decontamination of assets. A summary of this differentiator data for each scenario is given in Table 3.

Table 3: Scenarios with Task Function Differentiators

Source/Scenario	Category	Task Function Differentiators/Notes
TRB A-36 RFP		
Cyber attack (loss of power)	Terrorist	Continuity of operations
Flooding	Natural Disaster	Provide resources, determine structural integrity of transit assets, coordination of clearing/repair to reach damaged regions
Regional evacuation	Duplicate	Consequence; must be combined with an incident such as Hurricane or Hazmat
Chemical or Biological release	Terrorist	Security, life safety, property conservation (decontamination), move responders in and out
Multiple explosions	Terrorist	Security, life safety, property conservation
Transit revenue vehicle collision	Accident	Move responders in and out, rerouting
Emergency Management Staff Trainer (EMST)		
Earthquake	Natural Disaster	Determine structural integrity of transit assets, coordination of clearing/repair to reach damaged regions, move responders in and out
Flood	Duplicate	
Hurricane Landfall	Natural Disaster	Regional evacuation
Pandemic Influenza	Natural Disaster	Continuity of operations, addressing public fear
Terrorist attack with multiple explosions	Duplicate	
Wildfire	Natural Disaster	Rerouting
Tornado outbreak	Natural Disaster	Rerouting
Severe weather at National Convention	Natural Disaster	Rerouting with high user capacity
Civil unrest at National Convention with attacks on transit assets	Terrorist	Security, life safety with high user capacity
National Planning Scenarios		
10 Kiloton Improvised Nuclear Device	Terrorist	Large scale evacuation, shelter in place in stations, loss of power and services
Aerosol Anthrax	Terrorist	Decontamination, addressing public fear

Source/Scenario	Category	Task Function Differentiators/Notes
Pandemic Influenza	Duplicate	
Plague	Terrorist	Continuity of operations, addressing public fear
Blister Agent	Terrorist	Security, life safety, crowd control, move responders in and out, decontamination
Toxic Industrial Chemicals	Terrorist	Evacuation, rerouting, decontamination
Nerve Agent	Terrorist	Security, life safety, crowd control, move responders in and out, decontamination
Chlorine Tank Explosion	Terrorist	Small scale evacuation in contaminated area
Major Earthquake	Duplicate	
Major Hurricane	Duplicate	
Radiological Dispersal Device	Terrorist	Rerouting, evacuation from contaminated zone, shelter in place in stations, decontamination
Bombing using Improvised Explosive Devices (IED)	Duplicate	
Food Contamination	Terrorist	Terrorist based scenario as specified by NPS summary, not highly applicable to transit
Foreign Animal Disease	Terrorist	Terrorist based scenario as specified by NPS summary, not highly applicable to transit
Cyber Attack	Duplicate	
SME Meetings		
Hurricane	Duplicate	
Terrorist attack with multiple explosions	Duplicate	
Blizzard	Natural Disaster	Shelter in place in station, inability for transit assets to operate
Terrorist attack with suicide transit operators	Terrorist	Internal security, life safety
Public Transportation System Security and Emergency Preparedness Planning Guide		
Bomb threat	Terrorist	Threat procedures
Unusual or out of place objects	Terrorist	Threat procedures
Chemical agent release	Duplicate	
Vehicle Born Improvised Explosive Device (VBIED)	Terrorist	Security, life safety. Subset of multiple explosions scenario.
Improvised explosive device in station/vehicle	Terrorist	Security, life safety, continuity of operations. Subset of multiple explosions scenario.

Source/Scenario	Category	Task Function Differentiators/Notes
Armed hijacking, hostage, or barricade situation in station/vehicle	Terrorist	Security, life safety, continuity of operations
Chemical, biological, or nuclear release in station/vehicle	Terrorist	Security, Life safety, decontamination.
Secondary explosive device directed at emergency responders	Terrorist	Security, must be combined with another scenario
Physical or information attack on control system	Terrorist	Internal security, continuity of operations
Physical or information attack on dispatch system	Terrorist	Internal security, continuity of operations
Improvised Explosive Device detonated near fuel facility	Terrorist	Internal security, continuity of operations
Airport Emergency Response Operations Simulation (AEROS)		
Aircraft incident	Accident	Not applicable across transit agencies
Bomb incident	Duplicate	
Crowd control	Duplicate	Consequence; must be combined with an incident such as Blizzard or Hazmat
Hazmat incident	Duplicate	
Severe storm	Duplicate	
Power failure	Accident	Continuity of operations
Sabotage	Duplicate	
Structural fire	Accident	Continuity of operations
Water rescue	Natural Disaster	Primarily on-scene activities
Fuel farm fire	Accident	Continuity of operations

To determine scenario priority, we considered the following criteria:

1. Each scenario's applicability to transit emergency management.
2. Each scenario's applicability to transit emergency operations center (command and control level) mitigation activities as opposed to primarily on-scene activities.
3. Each scenario's applicability to Tier One and Tier Two transit cities.
4. Each scenario's applicability for all specified exercise participant roles.
5. Each scenario's likelihood of occurring.
6. Ability to develop engaging storyline with multimedia injects.

Two additional criteria describe diversification considerations that were taken into account when group scenario topics.

7. Ability to exercise a diverse set of Command and Control (C2) mitigation activities across recommended scenarios.
8. Ability to provide all-hazards scenario set.

The following scenarios were approved by the panel:

1. Riverine flooding with hazmat (prototype)
2. Active shooter terrorist attack with multiple explosives
3. Hurricane with regional evacuation
4. Hazardous materials release
5. Cyber attack (loss of power)
6. Earthquake

Outlines for the recommend scenarios are found in Appendix A.

Phase II Findings

3.5 Field Test Evaluation Summary

Three field tests utilizing the prototype system were executed in Phase II.

The primary questions considered in the evaluation were:

- What are the participant's feelings and attitudes towards achievement of critical learning objectives during the TERA exercise?
- Did TERA present realistic content and an environment for participants to accurately perform their assigned role?
- Did TERA help participants gain a better understanding of how to make decisions during an emergency event?
- Should TERA be incorporated into training or education courses for transit agencies?

The first set of questions measured participant reaction responses on intended learning objectives for TERA. Additionally, the second set of questions measured participant reaction responses on realism of TERA scenario content, their user experience, and decision-making ability while playing the simulation. Finally, the third set of questions measured participant reaction responses to general expectations for the simulation tool, whether or not TERA should be incorporated for use in transit professional development, and areas users like best and least about using the tool. The evaluation form is included as Appendix E.

3.6 Field Test 1 Evaluation Results

At the conclusion of the first field test, participants were asked to rate their progress on five learning objectives intended for the simulation exercise using a one-to-five Likert scale to measure their improvement on critical emergency knowledge and skills (1 = no improvement, 5 = exceptional improvement). The learning objectives included the ability of participants to manage information and communication during a flood disaster, maintain focus on incident priorities and objectives, assess the situation and select the best course(s) of action, reflect upon the simulated experience and discuss the reasons for the decision, and identify and use transit assets and resources as needed. Overall, participants felt they made slightly above average progress on understanding the intended learning objectives (combined mean = 3.3, SD = 0.209). Moreover, participants evaluated not only intended learning objectives for the simulation exercise, but also provided both written and numeric feedback rating and summarizing their feelings and attitudes on the general use and presentation of TERA. Participants indicated they felt strongly that TERA presented realistic content (mean = 4.25, SD = 0.5), was an excellent tool for providing simulated learning experiences (mean = 4.5, SD = 0.577), they would participate in a future exercises (mean=4), and finally the tool should be incorporated into professional development training and education courses for their transit agency (mean = 4.25, SD = 0.957).

3.7 Field Test 2 Evaluation Results

At the conclusion of the second field test, participants felt they made above average progress on understanding the intended learning objectives (combined mean = 3.65, SD = 0.223). Additionally, participants indicated they felt strongly that TERA presented realistic content (mean=4), was an excellent tool for providing simulated learning experiences (mean=4.5, SD=0.577), they would participate in a future exercises (mean=4.75, SD=0.5), and finally the tool should be incorporated into professional development training and education courses for their transit agency (mean=4.25, SD=0.957).

3.8 Field Test 3 Evaluation Results

At the conclusion of the third and final field test, participants felt they made above average progress on understanding the intended learning objectives (combined mean = 3.75, SD = 0.306). Also, participants indicated they felt strongly that TERA presented realistic content (mean = 4.5, SD = 0.577), was an excellent tool for providing simulated learning experiences (mean = 4.25, SD = 0.5), they would participate in a future exercises (mean = 5), and finally the tool should be incorporated into professional development training and education courses for their transit agency (mean = 4).

3.9 Combined Evaluation Results

Overall, participants felt they made above average progress on understanding the intended learning objectives (combined mean for all field tests = 3.56, SD = 0.5995). Moreover, participants evaluated not only intended learning objectives for the simulation exercise, but also provided both written and numeric feedback rating and summarizing their feelings and attitudes on the general use and presentation of TERA. Participants indicated they felt strongly that TERA presented realistic content (combined mean = 4.25, SD = 0.5), was an excellent tool for providing simulated learning experiences (combined mean = 4.41, SD = 0.577), they would participate in a future exercises (combined mean = 4.58, SD = 0.519), and finally the tool should be incorporated into professional development training and education courses for their transit agency (combined mean = 4.16, SD = 0.957).

3.10 Field Test Comments and Lessons Learned

In the first field test, while all participants were involved in transit emergency management, not all provided participants had experience in their assigned exercise role. Only one of the participants performed his assigned exercise role as part of his job function. Senior agency emergency management personnel were on hand to give advice and guidance, which ensured the exercise went smoothly despite having some inexperienced participants. For the subsequent tests, we requested that participants have experience in their assigned exercise role in order to provide more relevant data for the training effectiveness evaluation.

Also in the first field test, we conducted a short “Learn the Interface” exercise which had generic tasks such as “Send an email.” At the end of this exercise, some of the participants were still a bit hesitant with the interface. Once they started working the flood scenario however, they were engaged by the storyline and reported that the experience was “fun” and “enjoyable.” (In one case, it was truly a remarkable change in attitude and body language from “I should have called in sick today” to “Once I got into it, I really enjoyed it.”) In response to this, we developed a new “Learn the Interface” exercise which frames the tasks in a realistic context, namely a severe storm scenario, in an attempt to engage the participants earlier. This short scenario is not meant as a full exercise, but as a familiarization tool. We utilized this contextual “Learn the Interface” scenario in the second and third field tests.

Following are some participant comments from the field tests:

- “TERA is easy to use and friendly to the non-techie.”
- “TERA kept all participants engaged at a higher level than most other exercises I have participated in.”
- “TERA is a tool that can be used in a group or individual setting, so it could be used more often than other training products I have seen.”
- “TERA is potentially more effective than a paper and pencil table top exercises.”
- “TERA made me aware of what I needed to learn and practice.”
- “TERA kept me engaged and on my toes with additional injects.”
- “TERA was very realistic.”
- “TERA was highly interactive and the training was beneficial.”

Phase III Findings

3.11 Deployment

The 2012 Transportation Hazards and Security Summit and Peer Exchange was utilized as a platform to evaluate the final system with two scenarios. The training event was deemed a success as each of the exercise goals was met. Constructive feedback, which is outlined in detail in Appendix G, was generated to enhance future exercises. The following captures highlights from the feedback:

- TERA is a valuable system that will drastically benefit the transportation industry as the industry is focused on collaboration.
- It is incredibly beneficial to be able to log-in to a training event from multiple locations as gathering personnel is often a struggle when conducting exercises.
- The system has tremendous potential and opportunity to broaden the scope of training. The transportation industry is looking forward to the upgrades and updates that will expand upon the system.

Recommendations for the road ahead are as follows:

- Expand upon TERA with more scenarios and robust roles.
- Develop a transportation-centric version of the training platform. In doing so, consider joining all exercise platforms under one name.
- Expand upon existing relationships to incorporate additional audiences into TERA.

To properly prepare for the event, three lead state exercises were facilitated at the following locations: Washington, California, and West Virginia. Each state received complete and all-inclusive training on TERA in order to develop “peer assistant trainers” for the Security Summit. An After Action Review (AAR) for each exercise is featured in Appendix G.

TERA trainers also led ten first-look state exercises. The first look state exercise consisted of an introduction briefing, a demonstration and/or a staff training event via a teleconference. The first-look exercises were conducted to create awareness and acquire TERA access prior to the Security Summit. The following states participated in the training: New Jersey, Minnesota, New Hampshire, Alaska, Mississippi, Wisconsin, Ohio, Wyoming, Massachusetts and Maryland.

At the Security Summit, states were arranged by the four AASHTO regions and one non-AASHTO region. Each entity was assigned a training room, a TERA facilitator, and a lead state exercise participant to assist with the exercise.

The exercise day (22 August 2012) began with an introduction briefing for all participating personnel. This briefing explained the history of TERA and its relationship to the National Guard product known as the Emergency Management Staff Trainer (EMST). It also addressed how to acquire a password, the different functions within the interface and a “Learn the Interface” training session. The morning session closed out with an individual training session where users were able to rehearse the flood and active shooter scenarios within TERA.

The afternoon session launched the staff training component of the exercise. Each respective room was able to lead a staff training exercise on the flood scenario within TERA. The exercises were either a group effort (i.e. led by an AASHTO region representative) or an individual state effort that linked the participant with their state colleagues operating from a remote location. Regardless of the format, each participant was able to play one of the following roles: Operations Coordinator, DOT Representative, Planning Coordinator, Logistics Coordinator, Emergency Manager, Finance/Administration, Law Enforcement, or Public Information Officer within a scenario of their choice.

Following the staff training component of the exercise, participants gathered for a working AAR. The first portion of the AAR was devoted to organizational development. Participants expressed how TERA assisted their organization in handling the scenario mission. The second portion was dedicated to a TERA analysis. This portion allowed participants to identify TERA upgrades and adjustments. Additionally, all participants were able to fill out a written feedback form to communicate their opinions.

The final portion of the exercise day was devoted to TERA enhancements. TERA facilitators led the discussion on the near-term goals for interface enhancements.

The six release scenarios were finalized based on this feedback. The scenario scripts are found in Appendix H of the contractor's final report, and the TERA scenario tasking broken out by role in Appendix I of the contractor's final report.

All issues and recommendations from field testing, the summit training event, and beta testing are summarized in Appendix J of the contractor's final report. Final status is provided for each item.

A follow-on exercise and train-the-trainer event was subsequently planned and executed in conjunction with the 2013 Transportation Hazards and Security Summit and Peer Exchange in August 2013, under Modification 2 of the contract.

Overall Accomplishments under NCHRP-funded Modification 2

- We expanded TERA into the DOT domain as a part of this project. We also added an airport EOC scenario (Fuel Farm Fire) and a rail incident scenario (Crossing Incident), both of which were developed outside the scope of this project but which we felt would enhance TERA's capabilities.
- As a result of adding the DOT, airport, and rail scenarios, and in response to suggestions received at the 2013 Summit, we renamed TERA, replacing Transit with Transportation, to be the Transportation Emergency Response Application. We updated the logo to reflect this change:

TERA
TRANSPORTATION EMERGENCY RESPONSE APPLICATION

- We created an informational website to promote the webinars and on-site exercises at www.about.tera.train-emst.com. The website includes an updated informational video and brochure.

Customize scenario for DOT

- We conducted teleconference meetings with DOT Subject Matter Experts (SMEs) from West Virginia DOT and Caltrans. During these meetings, we discussed the available scenarios and chose the Flood for expansion into the DOT domain.
- We worked with the SMEs to determine the set of roles to be exercised in the DOT emergency operations domain. While there are many DOT support roles that are supported by the simulation, these are the roles that can be executed by a live player in an exercise. The roles are
  - Department of Transportation Emergency Manager
  - Department of Transportation Logistics
  - Department of Transportation Finance/Administration
  - Department of Transportation Operations
  - Department of Transportation Plans
  - Department of Transportation Public Information Officer
  - Department of Transportation Safety Officer

  These roles conform to the guidance given by the National Response Framework and Incident Command System.
- We worked with the SMEs to develop a spreadsheet of all injects to be delivered to the live roles during the Flood scenario. We implemented the DOT flood scenario with the same timeline and collective injects (e.g., TV reports, web news articles) as the existing Transit TERA flood scenario, so DOT and transit agencies can work together in a collaborative exercise if desired.
- We executed the TERA test plan for the scenario, and deployed the completed scenario to the TERA server.

CHAPTER 4: RECOMMENDATIONS

The following are topics and recommendations for implementing TERA to the transit community

4.1 Organizational Acceptance

For transit agencies to incorporate TERA into practice, the tool must first be accepted by the transportation community as an applicable tool for exercising decision making during emergency situations. A mechanism for encouraging organizational buy-in is to inform and obtain upper-level management support at both public and private transit agencies by demonstrating the capabilities and benefits of TERA to save time and training costs, improve personnel performance, and provide realistic simulated training experiences. In addition, endorsements from associations such as the American Public Transportation Association (APTA) and Community Transportation Association (CTAA) and the American Association of State Highway and Transportation Officials (AASHTO) would provide credibility to TERA, and help accomplish their mission for providing smart software solutions to state departments of transportation (i.e., AASHTOware). We propose a three-step approach for obtaining organizational buy-in and implementing TERA. Table 4 illustrates this approach by listing the steps, associated action(s), reasons for gaining organization acceptance, and suggested resources.

Table 4: Three-Phased Approach for Obtaining Organizational Acceptance

STEP	ACTION(S)	RATIONALE	SUGGESTED RESOURCES
Phase 1. Orient	➢ Set-up meetings and demonstrate TERA with state departments of transportation, transit associations, and other public and private transportation agencies	• Obtain acceptance and endorsements • Familiarize agencies with tool's capabilities • Begin to identify implementation requirements or best fit possibilities for where the tool could be incorporated into transit agencies (*e.g., augment existing course curriculum*)	o *State Transportation Research Centers (e.g., Louisiana Transportation Research Center)* o *American Public Transportation Association (APTA)* o *Community Transportation Association (CTAA)* o *American Association of State Highway and Transportation Officials Technology Implementation Group* o *World Conference on Transport Research Society*
Phase 2. Implement	➢ Create and implement outreach activities such as online or in-person peer exchanges, workshops, and stakeholder meetings.	• Maintain awareness of TERA with transit agencies • Provide training support for users and facilitators • Implement and evaluate best practices for using the tool	o *TRB Annual Conference* o *Transportation Hazards and Security Summit and Peer Exchange* o *Annual AASHTO National Transportation Management Conference*

Phase 3. Inform	➢ Document and write-up research results, best practices, and use cases for implementing the tool.	• Continue to maintain awareness of TERA with transit agencies • Validate the implementation approach • Market the tool to a wider audience and outside organizations with similar challenges	o *TRB Report* o *AASHTO Journal* o *Journal of Public Transportation* o *Journal of Transport Policy*

4.2 Financial and Technical Assistance Options

Besides organizational acceptance, monetary assistance or technical assistance from government organizations and private associations with similar or complementary missions would create a diversified support stream for long-term sustainment of TERA. Table 5 depicts some potential organizations that may be able to provide short or long-term support.

Table 5: Potential Organizations for Providing Financial or Technical Assistance

ORGANIZATION	EXAMPLES
Government Organizations	➢ Department of Transportation ➢ USDA's Emergency Management Division ➢ FEMA ➢ State Transit Administrations ➢ County Departments of Public Works and Transportation ➢ Metropolitan Area Transit Authorities
University Institutions	➢ University Transportation Research Centers ➢ National Transit Institute (NTI) ➢ Mineta Transportation Institute (MTI) ➢ University Transportation Centers (UTC)

4.3 Technical Support (Software)

Another area for consideration when implementing TERA is to provide technical support to assist users in problems or challenges that may arise when operating the software. In general, technical support services will attempt to help users solve specific problems with TERA rather than providing training, customization, or other support services (see Section 4.4 Training Support). Technical support may be delivered over the telephone or online by e-mail, website portal or directly through TERA where users can report an incident and the call can be logged by the support representative. Annual users guides that illustrate best practices and new features of the tool can also be issued to end user community as a form of technical support. Unlike facilitation guides that offer training support guidance, user guides are more technical in nature that provide information on how to use the primary functions of a system, troubleshooting tips when encountering problems or errors, and knowledge on where to locate further help and contact support details.

4.4 Training Support

The purpose of training support is to reinforce, maximize, and sustain the capability, capacity, and performance of TERA for the end user community (i.e., local, state, and federal transit agencies). Training support can be made available through in-person training systems such as train-the-trainer workshops or through independent references such as coaching or facilitation guides. Facilitation guides can be used to assist transit agencies in running an exercise by providing instruction that specifically concentrates on presenting teaching strategies and expert tips for understanding the scenario content and learning objective achievement.

TERA contains a Scenario Builder tool that allows users to tailor existing scenarios to their needs or develop new scenarios. Creating a scenario with multiple roles and assessment criteria is a complex task. Three day to one

week training courses can familiarize users with use of the Scenario Builder tool and best practices for developing customized scenarios.

4.5 System Sustainment

For local, state, and regional transit agencies to access and use TERA over the next 5 to 10 years, hardware and software updating needs should be considered. A key element to continued use of the system is providing a logistical tail to allow implementation of new features and incorporation of user feedback. Upgrades that address user feedback and evolving needs provide a sense of "ownership" for the user, while a system that doesn't change over time to meet the most frequent user requests will frustrate and eventually alienate the user community. Input for these upgrades and new features come via direct user feedback to the website, after action reviews following training events, and help desk requests.

Table 6 presents system sustainment needs along with strategies for fulfilling those needs.

Table 6: System Needs and Strategies for Need Fulfillment

System Sustainment Needs	Strategies for Need Fulfillment
Hardware o Hosting o Server maintenance	o Support and sustainment contract from sponsoring organization(s) (e.g., AASHTO) o Revenue stream from providing turnkey exercise facilitation.
Software o New features o Addressing user feedback	o Support and sustainment contract from sponsoring organization(s) (e.g., AASHTO) o Revenue stream from providing customization services

4.6 Follow-Up Research

To successfully implement TERA, follow-up research should be conducted to document and report the effectiveness and usage of the tool for teaching expert decision making strategies during rapidly evolving transit related emergency incidents. This phase of implementation will allow us to determine whether there is a consensus within a large cross-section of transportation professionals from small, midsize, and large transit agencies, thus further validating the identified critical tasks sequence, actions, and system requirements showing in each of the TERA scenarios. If discrepancies exist between the findings initially identified in the Phase II field testing, we will examine these discrepancies and make design adjustments to the existing simulation scenarios. The output of the follow-up research will be requirements used to enhance the existing scenarios, guide new scenarios, document best practices for using the tool, and present learning effectiveness results. All findings will be written in a report and other transit publications (see Table 4 – Organizational Acceptance; Inform Phase).

CHAPTER 5: CONCLUSION

Lessons learned from implementing TERA showed that a significant impediment to successful adoption of the tool was a reluctance to utilize a new technology-based method for conducting training exercises. A factor that should be considered for overcoming this reluctance is by providing real-time coaching and facilitation support within the user community. Our experience has shown that teaching learners how to properly use the tool provides the necessary guidance and experience needed for long-term effective use and promotion of the simulation exercise system. For this reason, ECS offers both onsite and webinar facilitation support services to as many transit agencies who wish to participate.

Similarly, another impediment we noticed during field testing is the reluctance for people who are “simulation-challenged”, meaning persons who do not engage in computer “game” or simulation play on a regular basis. We have found that along with the real-time facilitation and coaching, we encourage users to work in teams which can help remedy this issue and offer added benefits. For example, an inexperienced person who trains alongside an experienced transportation professional will be exposed to how to best make decisions in the simulation interface and directly being given mentoring. Mentoring involves the passing of wisdom, knowledge, and experience from the mentor to the learner. A primary goal of TERA is to foster mentoring relationships over a period of time and usage of the tool to adjust learner’s skill levels and needs. Mentoring teaches the learner how to think, rather than what to think, and mentors are usually people who have vast experience in a given domain. Mentoring can be an impactful teaching mechanism by providing one-on-one guidance, encouraging self-learning and reflection, and giving concise feedback after learners struggle through exercises.

APPENDIX A:
SCENARIO OUTLINES

Flood with Hazardous Material Spill (*Prototype*)

Casualties	50 fatalities, 100 injured, 30 require hospitalization
Infrastructure Damage	Thousands of residential homes, a chemical plant, a nursing home
Evacuations / Displaced Persons	75,000 people
Contamination	Various hazardous materials including ammonia, synthesis gas, potassium amide, hexane, and potassium metal.
Economic Impact	Hundreds of millions of dollars
Potential for Multiple Events	Hazardous Contamination
Recovery Time	Months to years

DETAILS

A winter with heavy snowfalls has begun to melt and heavy rains are predicted for the next several days which have the potential to cause major flooding. Minor flooding has already been occurring in the region. Twenty-four hours after the initial flooding concerns, a levee is breached upstream releasing millions of gallons of water. A few hours after the levee breech, a chemical plant downstream is flooded releasing various hazardous materials including ammonia, synthesis gas, potassium amide, hexane, and potassium metal into the water. To complicate matters, the contaminated flood waters begin to approach a senior citizens home a mile away. Emergency responders call the location transit authority for additional resources to evacuate.

TRANSIT AUTHORITY TASKS

- Preservation of the lives of employees and passengers
- Asset preservation
- Sorting through confusing and conflicting reports
- Assessing damage to facilities
- Providing higher levels of security
- Preparing a long-term plan for replacing subway service during repairs
- Providing psychological support to employees

Subway Bombing/Active Shooter Outline

Casualties	6 fatalities, 150 injured, 20 require hospitalization
Infrastructure Damage	1 subway line and 2 subway stations damaged
Evacuations / Displaced Persons	None
Contamination	None
Economic Impact	Minor
Potential for Multiple Events	None
Recovery Time	1 to 2 Months

DETAILS

A man enters a central subway station, boards a train, and exits at the next station. He leaves explosives on the train, which detonates within 10 minutes of his exiting the subway system. The man fires upon emergency responders when they attempt to enter the second station until he is eliminated 30 minutes later. Local law enforcement initially closes the area within a mile of the bombed stations to all street traffic.

SERVICE DISRUPTION

Transportation: All subway service must be shut down. Bus service will also cease until the following day. The decision of how soon to offer subway service remains open. Downtown streets are closed to all traffic for the first day. Most streets reopen on the second day, except those within a block of the damaged stations (in central locations).

Emergency Medical Services: Emergency responders are unable to reach the people injured by the bomb at the second station until protective shielding arrives, delaying response by 10 to 15 minutes. This affects thirty people.

TRANSIT AUTHORITY TASKS

- Preservation of the lives of employees and passengers
- Asset preservation
- Sorting through confusing and conflicting reports
- Initiating a system-wide shutdown
- Assessing damage to facilities
- Providing higher levels of security
- Preparing a long-term plan for replacing subway service during repairs
- Providing psychological support to employees

Hurricane

Casualties	62 fatalities, 10,000 injured (1,500 requiring hospitalization)
Infrastructure Damage	600 buildings destroyed (many by associated flooding), 10,000 buildings damaged, two bridges destroyed, airport runway temporarily unusable, almost no electrical power without generators
Evacuations/Displaced Persons	100,000 people evacuate before landfall
Contamination	No potable water for 7 days
Economic Impact	Estimated $10 billion
Potential for Multiple Events	Public unrest, waterborne illness, lack of hospital bed availability
Recovery Time	Months to years

DETAILS

A hurricane is expected to hit the city. It is predicted to be of Category 4 strength. There is widespread flooding and wind damage.

SERVICE DISRUPTION

Medical Services: One hospital unusable, other hospitals running on generators.

Fire and Emergency Medical Services: Most stations are operational with at least 50 percent of staff, but roads are frequently impassable. Response times are greatly increased.

Transportation: Two bridges have been destroyed. Train tracks withstand the hurricane but need to be inspected before they can be used. Flooding restricts travel through some areas, and there is widespread debris on the streets. Traffic lights and street lights are not operational.

Energy: Almost all buildings without generators are without power. Power is expected to be restored to 80% of buildings within 7 days after landfall.

Water: Residents are advised to avoid using any tap water, and to boil it if it is absolutely necessary to use some. Water treatment facilities are essentially non-operational.

Homelessness: 30,000 people need shelter pre-landfall and for the first few days after. One thousand people need long-term shelter.

Communication: Cellular phones do not work for the most part until power is restored. Local television and radio stations cease operations, but national television news is highly effective.

TRANSIT AUTHORITY TASKS

- Help in evacuation
- Asset preservation
- Providing transit routes to and from shelters
- Possibly providing temporary shelter to employees so that they are available to work
- Restoring service as much as possible under the conditions
- Preparing a long-term plan for offering transit service during recovery efforts
- Facility restoration
- Keeping track of expenditures

Earthquake

Casualties	650 fatalities, 15,000 injuries (4,000 requiring hospitalization)
Infrastructure Damage	35,000 buildings destroyed, 180,000 damaged, widespread power outage, breaks in water and gas lines, bridges collapse, airport runway unusable, many streets impassable
Evacuations/Displaced Persons	215,000 people
Contamination	Various hazardous materials
Economic Impact	Hundreds of millions of dollars
Potential for Multiple Events	Aftershocks, fires, people trapped
Recovery Time	Months to years

DETAILS

An earthquake of magnitude 7.4 hits suddenly, with its epicenter very near the city. Damage is most severe within a five-mile radius. A bus yard and a fuel yard become inaccessible. Relief shift workers are unable to reach the new transit EOC location for 2 days. A significant aftershock occurs early on the second day.

SERVICE DISRUPTIONS

Medical Services: Only two hospitals remain open; one at less than 50% capacity. Both are running on generators, and there is a desperate need for more hospital beds.

Fire and Emergency Medial Services: Only 16% of the stations are operating at greater than 50%. Dozens of trucks were damaged to the point of no longer being functional.

Transportation: Bridges have collapsed and there are significant obstructions on major highways. Damages to several major freeways are hampering incoming assistance. Railways and airport runways have buckled and sustained moderate to severe damage. All airports in the region are closed due to the communication disruptions, damaged runways, and instrument landing system failures.

Energy: Large scale power outages. There are numerous ruptures to underground fuel lines, oil lines, and natural gas lines.

Water: Most people are without water due to ruptured water mains and power outages. Wastewater primary interceptors were broken in the vicinity of the epicenter.

Homelessness: 150,000 people need temporary housing. Half of the existing pre-designed shelters have been damaged and cannot be used.

Communication: Damage to microwave dishes and other vital parts of the communications infrastructure have resulted in limited communications capabilities. Cellular towers have also been damage and the high cellular traffic after the earthquake has saturated the system.

TRANSIT AUTHORITY TASKS

- Preservation of the lives of employees and passengers
- Preservation of assets
- Evacuating people to shelters and temporary medical facilities
- Cleaning and certifying any vehicles used for transporting the injured afterwards
- Credentialing employees for activity past curfew
- Informing employees of the need to return to work
- Restoring service as far as possible
- Establishing long-term routes to and from shelters
- Provide psychological support to employees
- Securing fuel for buses and generators

Cyber Attack on the Power Grid

Casualties	No direct casualties, eight injuries from a secondary emergency
Infrastructure Damage	Minor
Evacuations/Displaced Persons	10,000 special needs persons require cooling centers
Contamination	None relevant to this scenario
Economic Impact	None relevant to this scenario
Potential for Multiple Events	Traffic problems (no lights), oppressive heat
Recovery Time	30 hours for power restoration, variable for secondary damage

DETAILS

A denial-of-service attack overloads and shuts down the power grid, affecting a large region including all adjacent states. The lack of functional traffic lights brings street traffic to a crawl. Exceptionally hot weather has descended upon the region, and only locations with generators have functional air conditioning. The demand for fuel for generators over the whole region makes it incredibly difficult to acquire.

SERVICE DISRUPTION

Medical Services: All hospitals are functioning on generator power, but all of them will need more fuel soon.

Fire and Emergency Medical Services: Response times are highly increased due to the street traffic during the first several hours.

Transportation: Street traffic becomes very congested and slow-moving within cities, though highway traffic is mostly unaffected. Law enforcement officials direct traffic at some intersections, private citizens take it upon themselves to direct traffic at others, and many other intersections have no direction.

Energy: Electrical power is cut off for 30 hours.

Water: Treatment plants are either shut down or running at minimal operational levels, but a shortage of clean drinking water is not anticipated during the short term.

Communication: Cellular phones and Internet communications are shaky at best. Local television and radio stations are able to produce limited broadcasts as long as their generators are operational, but most televisions and radios are without the power to receive these broadcasts, so they are ineffective for large-scale communication. The majority of the population attempts to receive information via their car radios.

TRANSIT AUTHORITY TASKS

- Transporting people to shelters
- Providing buses as cooling centers
- Responding to confusing and relatively uncontrolled street traffic
- Keeping track of buses which can not be safely returned to bus yards
- Notifying employees of operational status

.

Hazmat

Casualties	Zero deaths, one injury
Infrastructure Damage	Bus Station windows broken, fire damage
Evacuations/Displaced Persons	600 people evacuated from nearby office buildings
Contamination	Ammonia spill, Bleach Spill
Economic Impact	Minimal
Potential for Multiple Events	None
Recovery Time	Hours for the initial danger to pass, 1 to 2 days for cleanup

DETAILS

A bus station employee accidentally knocks over a barrel of hazardous materials in an attempt to remove the barrels from a storage closet after a small fire breaks out. HAZMAT Teams are immediately dispatched and develop a Hot, Warm, and Cold Zone. Nearby buildings and residences must be evacuated, and all persons who were located in the Bus Station when the evacuation was ordered must be checked for contamination.

SERVICE DISRUPTIONS

Train Service: Not effected.

Air Travel: Not effected.

Roads: The call for residents of nearby buildings to evacuate and the shutdown of the city streets cause traffic delays, which make it more difficult for emergency responders to reach their destinations during the first hour.

TRANSIT AUTHORITY TASKS

- Preservation of the lives of drivers and passengers who may be exposed
- Decontamination of people and station
- Certification of decontamination of station
- Help in evacuation of the residential area
- Help in relocation of bus station commuters
- Planning temporary routes during the cleanup effort

APPENDIX B:
PRIMARY COMMAND-LEVEL TRANSIT AGENCY ROLE PROFILES

Transit Emergency Manager

GENERAL DUTIES:

1. Serves as Manager in charge of strategic management of the emergency
2. Establishes the appropriate Emergency Operations Center (EOC) staffing level
3. Ensures that EOC is properly set-up and functional
4. Makes executive decisions, rules, regulations, and orders.
5. Coordinates regional transit decisions with other agencies

YOUR RESPONSIBILITY: Overall strategic command of the Emergency Response effort.

TASKS

Activation Phase:

- Determine appropriate level of activation based on situation as known.
- Mobilize appropriate personnel for the initial activation of the EOC.
- Respond immediately to EOC site and determine operational status.
- Obtain briefing from whatever sources are available.
- Ensure that the EOC is properly set up and ready for operations.
- Ensure that an EOC check-in procedure is established immediately.
- Ensure that an EOC organization and staffing chart is posted and completed.
- Determine which sections are needed, assign Section Chiefs as appropriate, and ensure they are staffing their sections as required.
- Determine which Management Staff positions are required and ensure they are filled as soon as possible.
- Ensure that telephone and/or radio communications with other EOCs are established and functioning.
- Schedule the initial Incident Action Plan meeting.
- Confer with the General Staff to determine what representation is needed at the EOC from other emergency response agencies.
- Assign a liaison officer to coordinate outside agency response to the EOC, and to assist as necessary in establishing an Inter-agency Coordination Group.
- Open and maintain an individual log to track your activities, time, and expenses to support the After Action Report and to support reimbursement claims

Operational Phase:

- Confer with the Transit Operations Coordinator and Transit Planning Coordinator to establish the severity of the emergency.
- Based on current status reports, establish initial strategic objectives for the EOC.
- In coordination with Management Staff, prepare EOC objectives for the initial Incident Action Plan Meeting.
- Convene the initial Incident Action Plan meeting. Ensure that all Section Chiefs, Management Staff, and other key agency representatives are in attendance.

- Once the Incident Action Plan is completed, determine the number of employees that will be needed to support the emergency response duties, and ensure notifications are made for employees to report.
- Ensure periodic damage assessments are being performed and that status reports are being developed.
- Conduct regular briefings until no longer warranted, and develop EOC Incident Action Plans for each EOC operational period.
- Consistent with the operational status of the system, provide mutual aid in the form of transportation services to other regional agencies. Coordinate regional transit decisions with the appropriate agencies.
- Monitor general staff activities to ensure that all appropriate actions are being taken.
- Brief your relief at shift change, ensuring that ongoing activities are identified and follow-on requirements are known.

Demobilization Phase:

- Authorize demobilization of sections, branches and units when they are no longer required.
- Notify higher level EOCs and other appropriate organizations of the planned demobilization, as appropriate.
- Ensure that any open actions not yet completed will be handled after demobilization.
- Ensure that all required forms or reports are completed prior to demobilization.
- Be prepared to provide input to the after action report.
- Turn in all time and expense claims to the Finance Section.
- Deactivate the EOC at the designated time, as appropriate.

Transit Operations Coordinator

PRIMARY: Transit Operations Coordinator

SUPERVISOR: Transit Emergency Manager

GENERAL DUTIES:

1. Implements the EOC Incident Action Plan (IAP).
2. Manages the Operations Section information from the field.
3. Receives information from the field and evaluates all facts from an overall strategic viewpoint.
4. Evaluates and acts on operational information.
5. Establishes a priority of actions that must be taken.

YOUR RESPONSIBILITY: Manage emergency operations functions in coordination with Maintenance, Dispatch Center, and Field Operations.

TASKS

Activation Phase:

- Automatically report to the EOC on notification of a major emergency affecting the agency.
- Open and maintain an individual log to track your activities, time, and expenses to support the After Action Report and to support for reimbursement claims.

Operational Phase:

- Identify yourself as the Transit Operations Coordinator to the Transit Emergency Manager.
- Obtain a briefing from the Command Staff.
- Evaluate the field conditions and determine the status of the resources.
- Establish and maintain field communications with affected areas.
- Brief operations personnel and assign specific work tasks to various units for implementation of the EOC Incident Action Plan.
- Receive, evaluate, and disseminate emergency operational information.
- Coordinate resource requests and field activities as needed.
- Determine personnel needs for field personnel, such as food and water, and coordinate with the Logistics Section.
- Provide relative emergency information to the Public Information Officer.

Demobilization Phase:

- Be prepared to provide input to the after-action report.
- Turn in all time and expense claims to the Finance Section.

Transit Planning Coordinator

PRIMARY: Transit Planning Coordinator

SUPERVISOR: Transit Emergency Manager

GENERAL DUTIES:

1. Manage the Planning Section in the EOC.
2. Manage information about the emergency and predict effects of the emergency event.
3. Brief and update the Command Staff on the impact of the emergency, including Damage Assessment.

YOUR RESPONSIBILITIES: Collection, evaluation, forecasting, formulation, dissemination, and use of information about the emergency and the status of resources.

TASKS

Activation Phase:

- Automatically report to the EOC on notification of a major emergency affecting the agency.
- Open and maintain an individual log to track your activities, time, and expenses to support the After Action Report and to support for reimbursement claims.

Operational Phase:

- Identify yourself as the Transit Planning Coordinator and obtain a briefing on the extent of the emergency.
- Call-in required staff members necessary to deal with the emergency.
- Determine information needs and implement methods to acquire additional data and facts for analysis, from sources such as aerial surveys and from Damage Assessment.
- Develop situational analysis information on the impact of the emergency.
- Keep in contact with the Chief Engineer for damage assessment results.
- Prepare priorities and objectives for the EOC Incident Action Plan, and prepare the IAP under the direction of the Transit Emergency Manager with input from the other Emergency Coordinators.
- Review intelligence information, determine the credibility, and predict the influence of the emergency.
- Assemble alternative strategies for dealing with the emergency.
- Identify the need for special resources.
- Prepare and distribute Transit Emergency Manager and Command Staff orders for additional resources.
- Display resource status, emergency status, and summary information within the EOC.
- Prepare Situational Summary Reports under the direction of the Transit Emergency Manager for transmission to the County EOCs.
- Begin the process of planning for Recovery.
- Maintain required records associated with the emergency: messages received, actions taken, requests filled, EOC personnel on duty.

Demobilization Phase:

- Be prepared to provide input to the after-action report.
- Turn in all time and expense claims to the Finance Section.

Transit Logistics Coordinator

PRIMARY: Transit Logistics Coordinator

SUPERVISOR: Transit Emergency Manager

GENERAL DUTIES:

1. Procure and provide personnel, materials, and facilities.
2. Brief and update the Transit Emergency Manager.
3. Manage the Logistics Section.

YOUR RESPONSIBILITIES: Manage logistical support such as Personnel, Vehicles/Equipment, Supply, Staging, Care and Shelter, and EOC Facilities.

TASKS

Activation Phase:

- Automatically report to the EOC on notification of a major emergency affecting the agency.
- Open and maintain an individual log to track your activities, time, and expenses to support the After Action Report and to support for reimbursement claims.

Operational Phase:

- Identify yourself as the Transit Logistics Coordinator and obtain a briefing on the extent of the emergency.
- Call in appropriate Logistics Section staff.
- Assign Logistics staff to cover the Logistics Section functions or units.
- Review the EOC Incident Action Plan and estimate resource needs for the next operational period.
- Estimate future service and support requirements.
- Coordinate and process all requests for resources.
- Advise on current resources, services, and support capabilities.
- Coordinate with the Transit Operations Coordinator to provide personnel, facilities, services, and materials in support of the Operations Section.
- Coordinate with the Transit Emergency Manager and Sections Chiefs to ensure that the EOC is set up properly and all supply needs are being addressed.
- Brief and update the Transit Emergency Manager on the status of resources and support requests, and any support concerns. Include priority status and proposed delivery plans.
- Maintain pertinent records and documents associated with the emergency.

Demobilization Phase:

- Be prepared to provide input to the after-action report.
- Turn in all time and expense claims to the Finance Section.

APPENDIX C:
TRAINING OBJECTIVES

Transit Emergency Manager

TERMINAL LEARNING OBJECTIVE:

1. Given an incident that requires a response from the Transit Emergency Manager (TEM), the learner will immediately gather information to gain situation awareness.

TASK:

Gain situation awareness by collecting and sharing relevant information.

CONDITION:

Coordinate and communicate with emergency personnel through email, phone, or person to person or another communicative means.

STANDARD:

Given the emergency, the learner will (1) activate the Transit EOC, (2) communicate with emergency agencies, and (3) seek and research all possible information sources regarding the incident.

EXPECTED ACTIONS:

Effectively collect and research information from all sources to gain accurate picture of unfolding events.

ENABLING LEARNING OBJECTIVES:

1.1. When presented with the task of gaining situation awareness, the learner will examine the Incident Briefing to determine activation level.
1.2. When presented with the task of gaining situation awareness, the learner will meet or call the Incident Commander to confirm and communicate transit needs.
1.3. When presented with the task of gaining situation awareness, the learner will examine websites and other information sources to become informed about the incident.

MEASUREMENT METHODS

ELO	Learning Level	Instructional System Strategy	Performance Measure
1.1.	Cognitive Domain 4-Analysis	Go to the EMST Library and locate the Incident Briefing	The learner will examine the Incident Briefing to determine the level of activation 15 minutes following the notification of the incident.
1.2.	Cognitive Domain 3-Application	Send an email or call using the address book	The learner will confirm the operational status by meeting with or calling the Incident Commander within 15 minutes of activating the Transit EOC.
1.3.	Cognitive Domain 4-Analysis	Go to the website and locate articles	The learner will research websites and other documents supporting the incident to gain situation awareness 30 minutes from the notification of the emergency event.

TERMINAL LEARNING OBJECTIVE:

2. Given an incident that requires a response from the Transit Emergency Manager, the learner will activate and staff the Transit EOC.

TASK:

Identify and notify all personnel who will be involved in the emergency response.

CONDITION:

Inform each section and member assigned to respond to the emergency incident.

STANDARD:

Given the emergency, the learner will (1) notify the Transit Coordinator assigned for responding to emergency incidents, (2) request staffing lists, (3) design a check-in process for each EOC department

EXPECTED ACTIONS:

Call, email or meet with each Transit EOC member working on the response effort.

ENABLING LEARNING OBJECTIVES:

2.1. When presented with the task of activating and staffing the Transit EOC, the learner will notify Coordinators who are responding to the incident.

2.2. When presented with the task of activating and staffing the Transit EOC, the learner will design a check-in procedure and distribute it to each department.

MEASUREMENT METHODS

ELO	Learning Level	Instructional System Strategy	Performance Measure
2.1.	Cognitive Domain 3-Application	Send an email or call using the address book	The learner will notify Coordinators responding to the incident within 10 minutes of activation of the Transit EOC.
2.2.	Cognitive Domain 3- Application	Email, EMST Library	The learner will design and implement a check-in procedure for each department 30 minutes after notifying each coordinator.

TERMINAL LEARNING OBJECTIVE:

3. Given an incident that requires a response from the Transit Emergency Manager, the learner will schedule the Initial Incident Action Plan meeting.

TASK:

Schedule an Initial Incident Action Plan meeting

CONDITION:

Inform appropriate personnel about the location and time of the IAP meeting

STANDARD:

Given the emergency, the learner will (1) confirm location and time of the meeting, (2) request organization charts, (3) examine response objectives for each department on slides for the IAP meeting.

EXPECTED ACTIONS:

Inform coordinators of the details of the IAP meeting such as the time, location, and materials needed.

ENABLING LEARNING OBJECTIVES:

3.1. When presented with the task of organizing the Initial Incident Action Plan Meeting, the learner will confirm the location and time for the IAP meeting with appropriate staff members.
3.2. When presented with the task of organizing the Initial Incident Action Plan Meeting, the learner will request each coordinator to provide an organizational chart at the IAP meeting.
3.3. When presented with the task of organizing the Initial Incident Action Plan Meeting, the learner will examine response objectives for each department on slides for the IAP meeting.

MEASUREMENT METHODS

ELO	Learning Level	Instructional System Strategy	Performance Measure
3.1.	Cognitive Domain 1-Knowledge	Send an email or call using the address book	The learner will confirm the location and time for the IAP meeting with appropriate staff members 20 minutes after activating the Transit EOC.
3.2.	Cognitive Domain 1-Knowledge	Send an email or call using the address book	The learner will request each coordinator to provide an organizational chart at the IAP meeting 30 minutes prior to the IAP meeting.
3.3.	Cognitive Domain 2-Comprehension	Meeting or conference call using address book	The learner will discuss response objectives for each department to be presented at the IAP meeting 15 minutes prior to the IAP meeting.

TERMINAL LEARNING OBJECTIVE:

4. Given an incident that requires a response from the Transit Emergency Manager, the learner will establish communication between the Transit EOC and other emergency agencies.

TASK:

Identify personnel to coordinate with additional emergency agencies.

CONDITION:

Inform personnel to establish communication procedures and inter-agency coordination efforts.

STANDARD:

Given the emergency, the learner will (1) identify and inform a staff member to setup communication procedures, (2) coordinate outside agency efforts with the Transit EOC.

EXPECTED ACTIONS:

Identify personnel through email or phone calls to establish communication procedures and outside agency coordination capability.

ENABLING LEARNING OBJECTIVES:

4.1. When presented with the task of establishing communication procedures, the learner will identify the staff member responsible for communicating with ESF #1.

4.2. When presented with the task of coordinating with outside agencies, the learner will identify personnel responsible for coordinating with outside agencies.

MEASUREMENT METHODS

ELO	Learning Level	Instructional System Strategy	Performance Measure
4.1.	Cognitive Domain 1-Knowledge	Send an email or call using the address book	The learner will identify the staff member responsible for communication procedures with ESF #1 within 15 minutes of EOC activation.
4.2.	Cognitive Domain 1-Knowledge	Send an email or call using the address book	The learner will identify personnel responsible for coordinating with outside agencies within 15 minutes of the EOC activation.

TERMINAL LEARNING OBJECTIVE:

5. Given an incident that requires a response from the Transit Emergency Manager, the learner will maintain appropriate documentation during all phases of the response.

TASK:

Record and maintain all documents.

CONDITION:

Organize and submit documentation during and after the incident.

STANDARD:

Given the incident, the learner will (1) record all activities, time, and expenses used throughout the incident, (2) oversee the use of official documentation, (3) turn in documentation by the end of the incident, and (4) review all documentation.

EXPECTED ACTIONS:

Collect and organize documentation throughout the incident and create a personal log of details throughout the emergency response.

ENABLING LEARNING OBJECTIVES:

5.1. When presented with the task of maintaining appropriate documentation throughout the incident, the learner will record all activities, time, and expenses using the appropriate form(s).
5.2. When presented with the task of maintaining appropriate documentation throughout the incident, the learner will review the accuracy and completeness of the documentation.
5.3. When presented with the task of maintaining appropriate documentation throughout the incident, the learner will submit all forms on-time to Finance.
5.4. When presented with the task of maintaining appropriate documentation throughout the incident, the learner will review the tracking log and other documents for the hot wash following the incident.

MEASUREMENT METHODS

ELO	Learning Level	Instructional System Strategy	Performance Measure
5.1.	Cognitive Domain 3 - Application	Create a tracking log to store in the EMST Library	The learner will create and record all activities, time, and expenses used throughout the incident.
5.2.	Cognitive Domain 2-Comprehend	Look in email box for documentation from the coordinators	The learner will oversee the accuracy, appropriate use, and completeness of documentation throughout the incident.
5.3.	Cognitive Domain 1-Knowledge	Email from EMST library to Financial Section	The learner will submit all documentation on-time for the financial section.
5.4.	Cognitive Domain 3-Application	Create slides for After Action Report	The learner will review the tracking log and other documents to provide input for the After Action Report following the incident.

TERMINAL LEARNING OBJECTIVE:

6. Given an incident that requires a response from the Transit Emergency Manager, the learner will coordinate and communicate with Transit EOC personnel.

TASK:

Provide leadership in the Transit EOC with effective coordination and communication.

CONDITION:

Provide consistent and ongoing communication and support for all members of the Transit EOC.

STANDARD:

Given the emergency, the learner will (1) confer with the Transit Operations and Planning Coordinators to establish the severity of the emergency, (2) convene the IAP meeting and additional briefings, and (3) maintain ongoing communication with members of the Transit EOC.

EXPECTED ACTIONS:

Collect and organize documentation throughout the incident and create a personal log of details throughout the emergency response.

ENABLING LEARNING OBJECTIVES:

6.1. When presented with the task of leading the emergency response from the Transit EOC, the learner will coordinate efforts with section chiefs throughout the incident.
6.2. When presented with the task of leading the emergency response from the Transit EOC, the learner will organize and conduct planning briefings throughout the incident (IAP, Shift Changes, etc.).
6.3. When presented with the task of leading the emergency response from the Transit EOC, the learner will maintain ongoing communication with all members throughout the incident.

MEASUREMENT METHODS

ELO	Learning Level	Instructional System Strategy	Performance Measure
6.1.	Cognitive Domain 3-Application	Email, phone, meet with section chiefs regularly	The learner will coordinate efforts with section coordinators throughout the incident within 15 minutes of each scenario inject.
6.2.	Cognitive Domain 3-Application	Complete/post IAP documentation in the EMST Library.	The learner will organize and conduct planning briefings throughout the incident as needed and distribute completed documentation from meetings.
6.3.	Cognitive Domain 5-Synthesis	Meet all requests through email, phone, or meetings.	The learner will maintain ongoing communication with all members throughout the incident when prompted. (10 minute response time)

TERMINAL LEARNING OBJECTIVE:

7. Given an incident that requires a response from the Transit Emergency Manager, the learner will respond and collaborate with external agencies in supporting all emergency response efforts.

TASK:

Coordinate Transit EOC responses with outside agencies.

CONDITION:

Collaborate with other agencies and support all needs from the Transit EOC.

STANDARD:

Given the emergency, the learner will (1) create a list of needs from other agencies, and (2) coordinate action steps through section coordinators.

EXPECTED ACTIONS:

Communicate with other agencies to collect requests for support from the Transit EOC and coordinate action steps through the planning coordinator.

ENABLING LEARNING OBJECTIVES:

7.1. When presented with the task of supporting the needs from outside agencies, the learner will create and prioritize a list of requests gathered from outside agencies.

7.2. When presented with the task of supporting the needs from outside agencies, the learner will plan and execute actions to support external requests with support from the planning coordinator.

MEASUREMENT METHODS

ELO	Learning Level	Instructional System Strategy	Performance Measure
7.1.	Cognitive Domain 3-Application 4-Analysis	Create list of requests though EMST Library	The learner will create and prioritize a list of requests gathered from outside agencies within the first 45 minutes of activation and throughout the incident.
7.2.	Cognitive Domain 3-Application	Email, phone, communicate with Planning Coordinator	The learner will plan and execute action steps to support external requests within 15 minutes following each request.

TERMINAL LEARNING OBJECTIVE:

8. Given an incident that requires a response from the Transit Emergency Manager, the learner will maintain consistent communication with the press and media outlets.

TASK:

Communicate a controlled response to press and/or media.

CONDITION:

Structure a message that communicate the facts based on the public's need to know.

STANDARD:

Given the incident, the learner will (1) craft a press release, (2) review and revised all communications going to the media/press.

EXPECTED ACTIONS:

Support communications with media and/or press either written or verbally.

ENABLING LEARNING OBJECTIVES:

8.1. When presented with the task of maintaining consistent communication with the press and media outlets, the learner will write or support the writing of a press release.

8.2. When presented with the task of maintaining consistent communication with the press and media outlets, the learner will review all communications whether verbally or written to the media.

MEASUREMENT METHODS

ELO	**Learning Level**	**Instructional System Strategy**	**Performance Measure**
8.1.	Cognitive Domain 3 - Application	Use email	The learner will write or support the writing of a press release.
8.2.	Cognitive Domain 3-Application	Use email, documentation tools	The learner will review all communications whether verbally or written to the media.

TERMINAL LEARNING OBJECTIVE:

9. Given an incident that requires a response from the Transit Emergency Manager, the learner will coordinate and support demobilization phase activities.

TASK:

Support demobilizing activities relevant to the Transit EOC's response.

CONDITION:

Confirm that all tasks have been completed, and communicate with on-scene officials to determine support for demobilizing.

STANDARD:

Given the incident, the learner will (1) confirm with all coordinators that tasks are carried out and completed, (2) notify appropriate personnel and/or agencies of the Transit EOC's demobilization process, and (3) notify all appropriate personnel that the Transit EOC has been deactivated.

EXPECTED ACTIONS:

Communicate with section coordinators to determine the status of open actions and notify all appropriate personnel of the demobilization process.

ENABLING LEARNING OBJECTIVES:

9.1. When presented with the task of coordinating the demobilization phase, the learner will confirm with section coordinators that all tasks have been successfully completed.
9.2. When presented with the task of coordinating the demobilization phase, the learner will notify all appropriate personnel of the demobilization process.
9.3. When presented with the task of coordinating the demobilization phase, the learner will notify all appropriate personnel that the Transit EOC has been deactivated.

MEASUREMENT METHODS

ELO	Learning Level	Instructional System Strategy	Performance Measure
9.1.	Cognitive Domain 3-Application	Email, phone using address book	The learner will confirm with section coordinators that all tasks have been successfully completed throughout the incident until all actions are completed.
9.2.	Cognitive Domain 3-Application	Email, phone using address book	The learner will notify all appropriate personnel of the demobilization process within 20 minutes of confirming all open actions have been completed.
9.3.	Cognitive Domain 3-Application	Email, phone using address book	The learner will notify all appropriate personnel within 15 minutes that the Transit EOC has been deactivated following the completion of the demobilization process.

Transit Operations Coordinator

TERMINAL LEARNING OBJECTIVE:

1. Given an incident that requires a response from the Transit Operations Coordinator (TOC), the learner will coordinate with the Transit Emergency Manager (TEM) to activate the Transit EOC.

TASK:

Organize the Transit Operations Section to support the activation of the Transit EOC.

CONDITION:

Respond to the TEM and determine the activation level.

STANDARD:

Given the incident, the learner will (1) respond to the TEM on notification of a major emergency, (2) examine the Incident Briefing to gain situational awareness, and (3) notify Transit Operations Section staff.

EXPECTED ACTIONS:

Communicate with the TEM to determine activation level and gain situational awareness.

ENABLING LEARNING OBJECTIVES:

1.1. When presented with the task of supporting the activation of the Transit EOC, the learner will contact the TEM in response to the emergency notification.

1.2 When presented with the task of supporting the activation of the Transit EOC, the learner will examine the Incident Briefing to gain situational awareness.

1.3 When presented with the task of supporting the activation of the Transit EOC, the learner will contact appropriate personnel needed to activate and support the Transit Operations Section.

MEASUREMENT METHODS

ELO	Learning Level	Instructional System Strategy	Performance Measure
1.1.	Cognitive Domain 3-Application	Email, phone using address book	The learner will contact the TEM in response to the notification of a major emergency within 10 minutes of the activation notification.
1.2.	Cognitive Domain 4-Analysis	Go to the EMST Library and locate the Incident Briefing	The learner will examine the Incident Briefing to gain situation awareness 10 minutes following the response to the TEM.
1.3.	Cognitive Domain 3-Application	Email, phone using address book	The learner will notify all personnel needed to support the Transit Operations Section within 10 minutes of gaining situation awareness.

TERMINAL LEARNING OBJECTIVE:

2. Given an incident that requires a response from the Transit Operations Coordinator, the learner will maintain appropriate documentation throughout all response phases.

TASK:

Record and maintain all documents throughout the emergency response

CONDITION:

Organize documentation for briefings during and after the incident.

STANDARD:

Given the emergency, the learner will (1) record all activities, time, and expenses used throughout the incident, (2) oversee the use of official documentation throughout the incident, and (3) turn in documentation by the end of the incident.

EXPECTED ACTIONS:

Collect and organize documentation throughout the incident and create a personal log of details throughout the emergency response.

ENABLING LEARNING OBJECTIVES:

2.1 When presented with the task of maintaining appropriate documentation throughout the incident, using the appropriate forms the learner will record all activities, time, and expenses used throughout the incident.

2.2 When presented with the task of maintaining appropriate documentation throughout the incident, the learner will forward documentation to TEM for approval of official documentation throughout the incident.

2.3 When presented with the task of maintaining appropriate documentation throughout the incident, the learner will submit all documentation on-time to finance.

MEASUREMENT METHODS

ELO	Learning Level	Instructional System Strategy	Performance Measure
2.1.	Cognitive Domain 3-Application	Create a tracking log to store in the EMST Library	The learner will create and record all activities, time, and expenses used throughout the incident.
2.2.	Cognitive Domain 3-Application	Email documentation to TEM	The learner will forward documentation to TEM for approval prior to action.
2.3.	Cognitive Domain 3-Application	Email from EMST library to Finance	The learner will submit all documentation on-time for the financial section.

TERMINAL LEARNING OBJECTIVE:

3. Given an incident that requires a response from the Transit Operations Coordinator, the learner will oversee personnel performance of the Operations Section.

TASK:

Organize staff responsibilities and monitor competition of action steps throughout the incident.

CONDITION:

Communicate with staff to identify needs, responsibilities, and expectations.

STANDARD:

Given the incident, the learner will (1) create an organization chart for TEM and staff and (2) maintain communication with field personnel throughout the incident.

EXPECTED ACTIONS:

Inform staff members of responsibilities, identify personnel needs, and continue to communicate with personnel throughout the incident.

ENABLING LEARNING OBJECTIVES:

3.1 When presented with the task of overseeing the performance of the Operations Section, the learner will create and share an organization chart with all members of the Transit EOC.

3.2 When presented with the task of overseeing the performance of the Operations Section, the learner will share information and successfully respond to all members of the Transit EOC throughout the incident.

MEASUREMENT METHODS

ELO	Learning Level	Instructional System Strategy	Performance Measure
3.1.	Cognitive Domain 3-Application	Email and upload to EMST Library	The learner will create and share an organizational chart with all members of the Transit EOC prior to the IAP meeting.
3.2.	Cognitive Domain 3-Application	Email, phone using address book	The learner will share information and successfully respond to all members of the Transit EOC throughout the incident 10 to 20 minutes following each request.

TERMINAL LEARNING OBJECTIVE:

4. Given an incident that requires a response from the Transit Operations Coordinator, the learner will support in coordination of resource requests to the Transit EOC.

TASK:

Coordinate all requests for resources regarding field activities during the incident.

CONDITION:

Identify requests for resources, determine availability, and confirm delivery of resources.

STANDARD:

Given the emergency, the learner will (1) examine the need for resources from the IAP report, (2) determine the availability of resources, and (3) confirm the delivery of all resources for field activities.

EXPECTED ACTIONS:

Communicate with the planning section to successfully provide all resources needed regarding the emergency incident.

ENABLING LEARNING OBJECTIVES:

4.1 When presented with the task of supporting the coordination of resource requests to the Transit EOC, the learner will examine and help prioritize resources needed while working with the Transit Planning Coordinator.

4.2 When presented with the task of monitoring delivery of on-scene resources, the learner will coordinate with the Transit Logistics Coordinator to provide essential resources to on-scene personnel.

4.3 When presented with the task of monitoring the delivery of all resources for field activities, the learner will confirm the delivery of all resources for field activities.

MEASUREMENT METHODS

ELO	Learning Level	Instructional System Strategy	Performance Measure
4.1.	Cognitive Domain 4-Analysis	IAP Report, Email	The learner will examine the resources needed from the Transit Planning Coordinator within 30 minutes following the IAP meeting.
4.2.	Cognitive Domain 3-Application	Email, phone using address book	The learner will coordinate with the logistics coordinator to provide essential resources to on-scene personnel within 20 minutes after the IAP meeting.
4.3.	Cognitive Domain 3-Application	Email, phone using address book	The learner will confirm the delivery of all resources for field activities 1 hour following the request for resources.

TERMINAL LEARNING OBJECTIVE:

5. Given an incident that requires a response from the Transit Operations Coordinator, the learner will support demobilization activities.

TASK:

Demobilize all resources used during the operational phase.

CONDITION:

Confirm all tasks assigned and field activities assigned from the TEM are completed.

STANDARD:

Given the emergency, the learner will (1) confirm field activities are completed, (2) demobilize all resources used in field activities, and (3) evaluate the performance of the Operations Section and prepare for the After Action Report.

EXPECTED ACTIONS:

Contact field personnel to confirm all tasks are completed and monitor the demobilization phase of the incident.

ENABLING LEARNING OBJECTIVES:

5.1 When presented with the task of supporting demobilization activities for the Operations Section, the learner will confirm with on-scene personnel that all tasks are completed.

5.2 When presented with the task of supporting demobilization activities for the Operations Section, the learner will notify personnel involved in demobilization of all resources used for on-scene activities.

5.3 When presented with the task of supporting demobilization activities for the Operations Section, the learner will examine the tracking log and provide slides for the hot wash.

MEASUREMENT METHODS

ELO	Learning Level	Instructional System Strategy	Performance Measure
5.1.	Cognitive Domain 3-Application	Email, phone using address book	The learner will confirm with field personnel that all tasks are completed.
5.2.	Cognitive Domain 3-Application	Email, phone using address book	The learner will notify personnel of the demobilization of all resources used for field activities.
5.3.	Cognitive Domain 4- Analysis	Tracking Log: EMST Library	The learner will examine the tracking log to provide slides for the hot wash.

Transit Planning Coordinator

TERMINAL LEARNING OBJECTIVE:

1. Given an incident that requires a response from the Transit Planning Coordinator (TPC), the learner will communicate and coordinate with the Transit Emergency Manager (TEM) in supporting the activation of the Transit EOC.

TASK:

Organize and staff the planning section to support the activation of the Transit EOC.

CONDITION:

Respond to the TEM and determine the activation level.

STANDARD:

Given the incident, the learner will (1) respond to the TEM upon notification, (2) examine the Incident Briefing to gain situation awareness, (3) notify planning section staff, and (4) retrieve information to prepare for the Initial Incident Action Plan meeting.

EXPECTED ACTIONS:

Communicate with the TEM to determine activation level and gain situation awareness.

ENABLING LEARNING OBJECTIVES:

1.1 When presented with the task of supporting the activation of the Transit EOC, the learner will contact the TEM in response to the notification of a major emergency.
1.2 When presented with the task of supporting the activation of the Transit EOC, the learner will examine the Incident Briefing to gain situation awareness.
1.3 When presented with the task of supporting the activation of the Transit EOC, the learner will contact all personnel needed to activate the Transit Planning Section.
1.4 When presented with the task of supporting the activation of the Transit EOC, the learner will create a list of information needed to prepare for the IAP meeting.

MEASUREMENT METHODS:

ELO	Learning Level	Instructional System Strategy	Performance Measure
1.1.	Cognitive Domain 3-Application	Email, phone using address book	The learner will contact the TEM in response to the notification of a major emergency within 10 minutes of the activation notification.
1.2.	Cognitive Domain 4-Analysis	Go to the EMST Library and locate the Incident Briefing	The learner will examine the Incident Briefing to gain situational awareness 10 minutes following the response to the TEM.
1.3.	Cognitive Domain 3-Application	Email, phone using address book	The learner will notify all personnel needed for the Transit Planning Section of the Transit EOC within 10 minutes of gaining situation awareness.
1.4.	Cognitive Domain 3-Application	Email, phone using address book	The learner will notify the Incident Commander of additional information needed for the IAP meeting within 15 minutes of reviewing the Incident Briefing.

TERMINAL LEARNING OBJECTIVE:

2. Given an incident that requires a response from the Transit Planning Coordinator, the learner will maintain appropriate documentation throughout all response phases.

TASK:

Record and maintain all documents

CONDITION:

Organize documentation for briefings and reports during and after the incident.

STANDARD:

Given the incident, the learner will (1) record all activities, time, and expenses used throughout the incident, (2) oversee the use of official documentation throughout the incident, and (3) turn in documentation by the end of the incident.

EXPECTED ACTIONS:

Collect and organize documentation throughout the incident and create a personal log of details throughout the emergency response.

ENABLING LEARNING OBJECTIVES:

2.1 When presented with the task of maintaining appropriate documentation, the learner will record all activities, time, and expenses.
2.2 When presented with the task of maintaining appropriate documentation, the learner will forward documentation to TEM for approval.
2.3 When presented with the task of maintaining appropriate documentation, the learner will submit all documents on-time to Finance.

MEASUREMENT METHODS:

ELO	Learning Level	Instructional System Strategy	Performance Measure
2.1.	Cognitive Domain 3-Application	Create a tracking log to store in the EMST Library	The learner will create and record all activities, time, and expenses used throughout the incident.
2.2.	Cognitive Domain 3-Application	Email documentation to TEM	The learner will forward documentation to TEM for approval throughout the incident.
2.3.	Cognitive Domain 3-Application	Email from EMST library to Financial Section	The learner will submit all documentation on-time to finance.

TERMINAL LEARNING OBJECTIVE:

3. Given an incident that requires a response from the Transit Planning Coordinator, the learner will support planning for Transit EOC's response.

TASK:

Determine infrastructure status to identify priorities and objectives for Transit EOC Incident Action Plan.

CONDITION:

Obtain impact assessments for planning purposes.

STANDARD:

Given the incident, the learner will (1) locate a damage assessment report, (2) develop situation analysis of the emergency to share with members of the Transit EOC, and (3) analyze all reports to determine priorities and objectives for the IAP.

EXPECTED ACTIONS:

Retrieve information regarding the emergency impact to plan action steps for the Transit EOC.

ENABLING LEARNING OBJECTIVES:

3.1 When presented with the task of planning for the Transit EOC, the learner will request a damage assessment report.
3.2 When presented with the task of planning for the Transit EOC, the learner will develop a situation analysis and distribute it to the entire Transit EOC.
3.3 When presented with the task of planning for the Transit EOC, the learner will analyze all reports to determine the objectives for the IAP.

MEASUREMENT METHODS:

ELO	Learning Level	Instructional System Strategy	Performance Measure
3.1.	Cognitive Domain 3-Application	Email and retrieve from EMST Library	The learner will contact the Chief Engineer and request a damage assessment.
3.2.	Cognitive Domain 3- Application	Email	The learner will develop a situation analysis and distribute it to the entire Transit EOC.
3.3.	Cognitive Domain 4- Analysis	IAP Slides EMST Library	The learner will analyze all reports to present the objectives for the IAP.

TERMINAL LEARNING OBJECTIVE:

4. Given an incident that requires a response from the Transit Planning Coordinator, the learner will identify resources and coordinate requests with the Transit Operations and Logistics Coordinators.

TASK:

Identify and inform the Transit Operations Coordinator

CONDITION:

Examine the IAP for resources needed to complete field activities.

STANDARD:

Given the emergency, the learner will (1) create a list of resources needed to complete action steps, and (2) request resources from the Transit Operations Coordinator, and (3) request additional resources from the appropriate agencies.

EXPECTED ACTIONS:

Communicate with the operations coordinator and logistics coordinator to provide all resources needed in regards to the emergency incident.

ENABLING LEARNING OBJECTIVES:

4.1 When presented with the task of identifying resources, the learner will complete appropriate documentation for requesting resources.
4.2 When presented with the task of identifying resources, the learner will coordinate the acquisition of resources needed to complete field activities.
4.3 When presented with the task of identifying the resources, the learner will request additional resources from the appropriate agencies.

MEASUREMENT METHODS:

ELO	Learning Level	Instructional System Strategy	Performance Measure
4.1.	Cognitive Domain 3-Application	Forms EMST Library	The learner will complete appropriate documentation for requesting resources within 30 minutes of completing the IAP meeting.
4.2.	Cognitive Domain 3-Application	Email, phone using address book	The learner will inform the TOC and TLC of requests for resources to complete field activities within 10 minutes of filling out documentation.
4.3.	Cognitive Domain 3-Application	Email, phone using address book	The learner will request additional resources (if needed) from the appropriate agencies within 10 minutes of response from coordinators.

TERMINAL LEARNING OBJECTIVE:

5. Given an incident that requires a response from the Transit Planning Coordinator, the learner will provide Transit EOC members with updated Incident Action Plans.

TASK:

Communicate with other EOCs and prepare situational reports for all Transit EOC members.

CONDITION:

Obtain additional briefings from outside agencies and determine further action required by the Transit EOC.

STANDARD:

Given the emergency, the learner will (1) communicate with other agencies to identify additional actions, and (2) prepare situation reports for Transit EOC members.

EXPECTED ACTIONS:

Request reports from outside agencies throughout the incident and share impact of EOC Incident Action Plan.

ENABLING LEARNING OBJECTIVES:

5.1 When presented with the task of updating the Incident Action Plan for the Transit EOC, the learner will contact and request situation reports from external agencies.

5.2 When presented with the task of updating the Incident Action Plan, the learner will prepare additional situation reports for the Transit EOC.

MEASUREMENT METHODS:

ELO	Learning Level	Instructional System Strategy	Performance Measure
5.1.	Cognitive Domain 3-Application	Email, phone using address book	The learner will request situational reports from outside agencies within 30 minutes following the IAP.
5.2.	Cognitive Domain 3-Application	Email, phone using address book	The learner will prepare additional situation reports and distribute to Transit EOC coordinators

TERMINAL LEARNING OBJECTIVE:

6. Given an incident that requires a response from the Transit Planning Coordinator, the learner will coordinate with the TEM to support demobilization activities.

TASK:

Produce a demobilization plan.

CONDITION:

Confirm all objectives are completed to begin the demobilization phase.

STANDARD:

Given the incident, the learner will (1) confirm action objectives are completed, (2) construct and distribute the demobilization plan to other transit section coordinators, and (3) prepare a recovery plan based on performance of actions taken.

EXPECTED ACTIONS:

Confirm with other transit section coordinators the objectives are accomplished, demobilization has begun, and produce the After Action Report.

ENABLING LEARNING OBJECTIVES:

6.1 When presented with the task of providing a demobilization plan, the learner will coordinate and communicate with other transit section coordinators that all objectives are completed.

6.2 When presented with the task of providing a demobilization plan, the learner will distribute the plan to other transit section coordinators.

6.2 When presented with the task of providing a demobilization plan, the learner will conduct a hot wash to evaluate overall performance of the Transit EOC.

MEASUREMENT METHODS:

ELO	Learning Level	Instructional System Strategy	Performance Measure
6.1.	Cognitive Domain 3-Application	Email, phone using address book	The learner will confirm with transit coordinators that all objectives are completed and request actions needed to demobilize.
6.2.	Cognitive Domain 3-Application	Email, EMST Library	The learner will post the plan and inform coordinators within 30 minutes of notification from the TEM.
6.3.	Cognitive Domain 3-Application	Implement a hot wash	The learner will submit a request to section coordinators to prepare and attend a hot wash.

Transit Logistics Coordinator

TERMINAL LEARNING OBJECTIVE:

1. Given an incident that requires a response from the Transit Logistics Coordinator (TLC), the learner will coordinate with the Transit Emergency Manager (TEM) to activate the Transit EOC.

TASK:

Organize the Transit Logistics Section to support the activation of the Transit EOC.

CONDITION:

Respond to the TEM and determine the activation level.

STANDARD:

Given the emergency, the learner will (1) respond to the TEM upon notification, (2) examine the Incident Briefing to gain situation awareness, and (3) notify Transit Logistics Section staff.

EXPECTED ACTIONS:

Communicate with the TEM to determine activation level and gain situation awareness.

ENABLING LEARNING OBJECTIVES:

1.1 When presented with the task of supporting the activation of the Transit EOC, the learner will contact the TEM in response to the notification of a major emergency.

1.2 When presented with the task of supporting the activation of the Transit EOC, the learner will examine the Incident Briefing to gain situational awareness.

1.3 When presented with the task of supporting the activation of the Transit EOC, the learner will contact all personnel needed to activate the Transit Logistics Section.

MEASUREMENT METHODS:

ELO	Learning Level	Instructional System Strategy	Performance Measure
1.1.	Cognitive Domain 3-Application	Email, phone using address book	The learner will contact the TEM in response to the notification of a major emergency within 10 minutes of the activation notification.
1.2.	Cognitive Domain 4-Analysis	Go to the EMST Library and locate the Incident Briefing	The learner will examine the Incident Briefing to gain situation awareness 10 minutes following the response to the TEM.
1.3.	Cognitive Domain 3-Application	Email, phone using address book	The learner will notify all personnel needed for the Transit Planning Section of the Transit EOC within 10 minutes of gaining situation awareness.

TERMINAL LEARNING OBJECTIVE:

2. Given an incident that requires a response from the Transit Logistics Coordinator, the learner will maintain appropriate documentation throughout the emergency response.

TASK:

Record and maintain all documents throughout the emergency response

CONDITION:

Organize and complete documentation during and after the incident.

STANDARD:

Given the emergency, the learner will (1) record all activities, time, and expenses used throughout response phases, (2) oversee the use of official documentation, and (3) submit documentation to Finance.

EXPECTED ACTIONS:

Collect and organize documentation and create a personal log detailing actions.

ENABLING LEARNING OBJECTIVES:

2.1 When presented with the task of maintaining appropriate documentation, the learner will record all activities, time, and expenses used throughout the incident.
2.2 When presented with the task of maintaining appropriate documentation, the learner will forward documentation to TEM for approval of official documentation throughout the incident.
2.3 When presented with the task of maintaining appropriate documentation, the learner will submit all documentation on-time to Finance.

MEASUREMENT METHODS:

ELO	Learning Level	Instructional System Strategy	Performance Measure
2.1.	Cognitive Domain 3-Application	Create a tracking log to store in the EMST Library	The learner will create and record all activities, time, and expenses used throughout the incident.
2.2.	Cognitive Domain 3-Application	Email documentation to TEM	The learner will forward documentation to TEM for approval of official documentation throughout the incident.
2.3.	Cognitive Domain 3-Application	Email from EMST library to financial section	The learner will submit all documentation on-time for the financial section.

TERMINAL LEARNING OBJECTIVE:

3. Given an incident that requires a response from the Transit Logistics Coordinator, the learner will oversee the performance of logistics personnel.

TASK:

Communicate and monitor staff responsibilities.

CONDITION:

Communicate with staff to express needs, responsibilities, and expectations.

STANDARD:

Given the emergency, the learner will (1) create an organization chart for TEM and staff, (2) identify facilities and personnel needed to complete expected actions, and (3) maintain communication with Transit EOC throughout the incident.

EXPECTED ACTIONS:

Inform staff members of responsibilities, identify personnel needs, and continue communication with personnel throughout the incident.

ENABLING LEARNING OBJECTIVES:

3.1 When presented with the task of overseeing the performance of the logistics personnel, the learner will create and share an organization chart will all members of the Transit EOC.
3.2 When presented with the task of overseeing the performance of the logistics personnel, the learner will consistently monitor performance.
3.3 When presented with the task of overseeing the performance of the logistics personnel, the learner will produce an assignment chart depicting roles and responsibilities.
3.4 When presented with the task of overseeing the performance of the logistics personnel, the learner will communicate anticipated transit resources and needs with other transit section coordinators.

MEASUREMENT METHODS:

ELO	Learning Level	Instructional System Strategy	Performance Measure
3.1.	Cognitive Domain 3-Application	Email and upload to EMST Library	The learner will create and share an organization chart will all members of the Transit EOC prior to the IAP meeting.
3.2.	Cognitive Domain 3-Application	Email, phone using address book	The learner will communicate with TEM to determine what facilities and personnel are needed within 20 minutes of the IAP meeting.
3.3.	Cognitive Domain 3-Application	Email and update EMST Library	The learner will organize staff to operate facilities by emailing an assignment chart within 15 minutes of activating facilities.
3.4.	Cognitive Domain 3-Application	Email, phone using address book, EMST Library	The learner will contact transit coordinators to determine future needs and create a list within an hour of the first phase of activation.

TERMINAL LEARNING OBJECTIVE:

4. Given an incident that requires a response from the Transit Logistics Coordinator, the learner will maintain communication with transit coordinators regarding the status of resources throughout the incident.

TASK:

Update and share assignment chart indicating facilities, personnel, and allocated resources.

CONDITION:

Assess IAP report and confirm all logistic needs are met.

STANDARD:

Given the emergency, the learner will (1) maintain an up-to-date log of resource status, and (2) effectively communicate with Transit EOC members to confirm logistic objectives are met.

EXPECTED ACTIONS:

Communicate with the coordinators confirming status of resources for the emergency incident.

ENABLING LEARNING OBJECTIVES:

4.1 When presented with the task of monitoring allocated resources, the learner will maintain a resource log for the Transit EOC.

4.2 When presented with the task of monitoring allocated resources, the learner will communicate with coordinators confirming all logistic needs are met.

MEASUREMENT METHODS:

ELO	Learning Level	Instructional System Strategy	Performance Measure
4.1.	Cognitive Domain 3-Application	EMST Library	The learner will maintain tracking log of allocated resources and future estimates within 30 minutes of receiving responses from coordinators.
4.2.	Cognitive Domain 3-Application	Email, phone using address book	The learner will communicate with coordinators confirming if logistic needs have been met within 2 hours of activation.

TERMINAL LEARNING OBJECTIVE:

5. Given an incident that requires a response from the Transit Logistics Coordinator, the learner will support demobilization activities

TASK:

Demobilize all resources used during the operational phase.

CONDITION:

Confirm with coordinators additional resources are not needed.

STANDARD:

Given the emergency, the learner will (1) confirm on-scene activities are completed, and additional resources are not allocated and (2) evaluate the performance of the logistics section and prepare for the hot wash.

EXPECTED ACTIONS:

Contact field personnel to confirm all tasks are completed and monitor the demobilization phase of the incident.

ENABLING LEARNING OBJECTIVES:

5.1 When presented with the task of supporting demobilization, the learner will confirm with transit coordinators that resources are no longer needed.

5.3 When presented with the task of supporting demobilization, the learner will examine the tracking log and provide slides for the hot wash.

MEASUREMENT METHODS:

ELO	Learning Level	Instructional System Strategy	Performance Measure
5.1.	Cognitive Domain 3-Application	Email, phone using address book	The learner will confirm with coordinators that resources are no longer needed within 10 minutes of notification of demobilization phase from the TEM.
5.3.	Cognitive Domain 4- Analysis	Tracking Log: EMST Library	The learner will examine the tracking log to provide slides for the After Action Report.

APPENDICES D TO K

Appendices D through K from the contractor's final report are not published in this Web Document. They are available on request from the project's senior program officer at saparker@nas.edu.

APPENDIX D: FIELD TEST INFORMATION SHEET

APPENDIX E: FIELD TEST INFORMATION SURVEY

APPENDIX F: EVALUATION FORM REPORT: FIELD TESTS 1-3

APPENDIX G: 2012 TRANSPORTATION HAZARDS AND SECURITY SUMMIT AND PEER EXCHANGE TERA TRAINING EVENT FEEDBACK

5.1 Training
5.2 Roles
5.3 User Interface
5.4 Funding
5.5 Written Feedback

APPENDIX H: SCENARIO SCRIPTS

Riverine Flood
Active Shooter
Hurricane
Earthquake
Power Outage
Hazmat Incident

APPENDIX I: TASKS BY ROLE

Tasks by Role: Riverine Flood
Tasks by Role: Active Shooter
Tasks by Role: Hurricane
Tasks by Role: Earthquake
Tasks by Role: Power Outage
Tasks by Role: Hazmat Incident

APPENDIX J: TERA ISSUES AND RECOMMENDATIONS

APPENDIX K: INSTALLATION INSTRUCTIONS

APPENDIX L: PREREQUISITE ONLINE FAMILIARIZATION TRAINING OUTLINES

PREREQUISITE TRAINING

For Transit Command-Level Decision Makers

Below are several prerequisite training course outlines that transit command-level decision makers should take prior to participating in TERA exercises. These training courses include ICS 100, 200, 300, 400, 700, and IC-801 Transportation.

ICS 100

The overall course goal is to promote effective response by:

- Familiarizing you with how Incident Command System (ICS) principles are used to manage incidents.
- Preparing you to coordinate with response partners from all levels of government and the private sector.

At the completion of this course, participants should be familiar with:

- ICS applications.
- ICS organizational principles and elements.
- ICS positions and responsibilities.
- ICS facilities and functions.
- ICS planning.

ICS 200

This course is designed to enable personnel to operate efficiently during an incident or event within the Incident Command System (ICS). This course focuses on the management of single resources.

At the completion of this course, participants should be able to:

- Describe the ICS organization appropriate to the complexity of the incident or event.
- Use ICS to manage an incident.
- Leadership and Management.
- Delegation of Authority and Management by Objectives.
- Functional Areas and Positions.
- Briefings.
- Organizational Flexibility.
- Transfer of Command.

ICS 300

This course provides training on and resources for personnel who require advanced application of the Incident Command System (ICS). This course expands upon information covered in the ICS-100 and ICS-200 courses.

At the completion of this course, participants should be able to:

- Describe how the NIMS Command and Management component supports the management of expanding incidents.
- Describe the incident/event management process for supervisors and expanding incidents as prescribed by the Incident Command System (ICS).
- Implement the incident management process on a simulated Type 3 incident.
- Develop an Incident Action Plan for a simulated incident.

ICS 400

This course provides training on and resources for personnel who require advanced application of the Incident Command System (ICS). This course expands upon information covered in ICS-100 through ICS-300 courses. These earlier courses are prerequisites for ICS-400.

At the completion of this course, participants should be able to:

- Explain how major incidents engender special management challenges.
- Describe the circumstances in which an Area Command is established.
- Describe the circumstances in which multiagency coordination systems are established.

ICS 700

This course provides an introduction to the National Incident Management System (NIMS).

At the completion of this course, participants should be able to:

- Describe the intent of NIMS
- Describe the key concepts and principles underlying NIMS
- Describe the purpose of the NIMS Components, including Preparedness, Communications and Information Management, Resource Management, and Command and Management
- Describe the purpose of the National Integration Center.

IC-801

The National Response Framework (NRF) presents the guiding principles that enable all response partners to prepare for and provide a unified national response to disasters and emergencies from the smallest incident to the largest catastrophe. As part of the NRF, ESFs are primary mechanisms at the operational level used to organize and provide assistance. This series of courses is designed to overview each of the 15 ESFs. This course provides an introduction to ESF #1—Transportation.

At the completion of this course, participants should be able to:

- Describe the overall purpose and scope of ESF #1.
- Identify the supplemental assistance ESF #1 provides to State, local, and Tribal governments.
- Identify typical actions accomplished by ESF #1 resources and teams.
- Describe the types of partnerships formed between ESF #1 and other response agencies and organizations.