A Guide to Emergency Management at State Transportation Agencies

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Preface

A Guide to Emergency Management at State Transportation Agencies, was developed for use by state transportation agencies as they plan and develop their organizational functions, roles, and responsibilities for emergency management within the all-hazards context of the National Incident Management System (NIMS). It is an update to NCHRP Report 525, Volume 16: A Guide to Emergency Response Planning at State Transportation Agencies, which provided an approach to all-hazards emergency management and documented existing practices in emergency response planning.

Similar to the 2010 Guide, this Guide is designed to support executive management and emergency response planners as they assess their emergency management programs and identify areas needing improvement. The Guide will help state transportation agency program level managers and their counterparts at other levels of government plan, organize, staff, train, exercise, manage, implement, and fund preparations to carry out their emergency management responsibilities. These include the primary and supporting agencies identified in each state’s Emergency Operations Plan (EOP) under Emergency Support Function ESF#1–Transportation. These responsibilities include all transportation modes that are under state control or influence and those functions agencies perform to support multi-state, state, and local emergencies.

Significant advances in emergency management, changing operational roles at State DOTs and other transportation organizations, along with federal guidance issued since 2010 have resulted in a need to re-examine requirements for state transportation agency emergency management functions, roles and responsibilities. The 2019 Guide incorporates current practices and guidance in emergency management, recognizing these advances and changing roles and guidance.

This Guide expands the focus from emergency response to all aspects of emergency management and reflects the evolving threats and hazards to transportation networks and systems. It also addresses emergency management in the broader context of community, regional, and national resilience and sustainability.

Similar to the previous edition, this Guide is

- **NIMS-compliant**, as it fully embraces the incident command, joint planning, standardization, and performance-based improvements in incident/emergency management (NIMS refresh, 2017).
- **All-hazards oriented**, which considers the full range of hazards and threats from minor traffic incidents to catastrophic events. It applies to all transportation agencies, at the state, local, tribal, and territorial levels, and to interregional coalitions.
- **Multimodal**, including all modes and sectors that use the highway system, including personal travel, transit, and commercial vehicle transport.
- **Oriented to the safe and efficient management** of incidents, for the safety of responders and victims alike, for preserving public and private infrastructure and socioeconomic activities, and for rapid restoration to normalcy.

The 2019 Guide is a light update to the 2010 Guide, and is not a major rewrite of the original. The update has consolidated the extensive material contained in both the 2010 Guide and the supplemental web only material and consolidated it into a more concise Guide with Appendices.
Consistent with the 2010 Guide, this Guide explores how transportation fits into the traditional emergency management community and what transportation offers. It is important to understand that a state transportation agency will always fulfill a role in the emergency management effort for all incidents from the routine traffic incident through major emergencies to catastrophic events. State agency plans and procedures are expected (indeed required if the agency seeks federal compensation) to be related to state and regional emergency structures and plans. This involves multi-agency, multi-jurisdictional cooperation in emergency planning and operations.

The Guide provides the legal/institutional perspective because it is imperative that a transportation agency understand what it must—or should—do and assess its capability to do it.

Similar to the 2010 Guide, the 2019 Guide does not directly address aviation, marine, heavy rail, or pipeline modes, although these modes and the threats against them can impact transportation infrastructure and operations. These modes should be considered, as appropriate, in the emergency management process (e.g., aviation and marine have a place in emergency evacuations).

Finally, as the 2010 Guide put it so well—this is a guide, not a standard.
Section 1: Introduction

Emergency management involves preparing for, responding to, and recovering from a disaster or emergency. It is a continuous process of managing threats and hazards to avoid or reduce the impact of incidents and events.

Transportation plays a critical and unique role in emergency management. Transportation’s unique role stems from the broad range of capabilities and responsibilities a transportation agency has: large and distributed workforces, easy access to heavy equipment, and a robust communications infrastructure. State transportation agencies have important resources that can be made available in the event of emergencies, such as transportation management centers, situation awareness, and field staff.

As the National Response Framework (NRF) states, “The ability to sustain transportation services, mitigate adverse economic impacts, meet societal needs, and move emergency relief personnel and commodities will hinge on effective transportation decisions at all levels.” To be ready for the agency’s role, a comprehensive emergency management program must be in place within the agency.

Overall DOT efforts have improved emergency response planning and training since the publication of the 2010 Guide. When an emergency occurs, routine day-to-day operations give way to a focused, practiced, and resilient crisis management approach that requires professional skills throughout the breadth and depth of the organization. Traffic Incident Management (TIM) provides processes and procedures for responders (firefighters, emergency medical services (EMS), law enforcement, towing and recovery, safety patrols, transportation and maintenance crews, and 9-1-1 professionals) to work together as a team to clear incidents safely and quickly. The National Incident Management System (NIMS) integrates best practices into a comprehensive framework for use by emergency management personnel at the local, state, and federal levels. The Incident Command System (ICS) provides the integration of facilities, equipment, personnel, procedures, and communications for emergencies.

As a part of their emergency management function, state DOTs are responsible for creating all-hazards plans and ensuring that employees have the ability to implement them. These all-hazards plans must conform with and complement the planning activities of the rest of the state’s operations and agencies as well as those of regional authorities. DOTs may coordinate planning efforts with other state agencies, including the state’s Emergency Management Agency; county highway departments; with various agencies of the U.S. Department of Transportation; and with DOTs from other states to ensure activities can be easily integrated when necessary. DOTs also need to plan to receive and use resources provided by other states and the federal government during operations. In conducting these activities, DOTs should consider applicable standards and best practices for incorporating risk and resilience into functions and systems.

Challenges Facing State Transportation Agencies
Planning for emergency management relates to the following important challenges for transportation agencies:

- Today there are higher expectations for system performance and reliability and lower tolerance for delays. Small events pose threats of great consequences since the impact of any incident is magnified when a transportation network is operating at or past its capacity – as is the case in portions of many states as travel demand on their transportation networks grows.
• Hazards and threats to the system continue to evolve. Transportation agencies are at increasingly greater risk from system-disrupting events due to natural causes, accidents, unintentional human intervention, or intentional interventions such as insider threats and criminal acts. In addition, the risk of natural and man-made events is growing due to numerous factors including aging infrastructure.
• Because today’s transportation systems integrate cyber and physical components, cyber risks are increasing, and include the risk of a cyber incident impacting not only data but the control systems of the physical infrastructure operated by transportation agencies (e.g., tunnel ventilation systems and traffic control systems).
• State transportation agencies have important resources that can be made available in the event of emergencies (transportation management centers, situation awareness, field staff, and heavy equipment).
• Effective emergency response is increasingly multimodal, including all modes and sectors that use the highway system—personal travel, transit, and commercial vehicle transport.
• There has been, and continues to be, significant deployment of new resources and rapidly developing technologies to support DOT activities such as ShakeCast, FloodCast and remote, in-situ, or portable monitoring/damage detection techniques and sensors such as sonar, radar, satellite imagery, and unmanned aerial vehicles.
• Traffic Incident Management (TIM) provides processes and procedures for responders (firefighters, EMS, law enforcement, towing and recovery, safety patrols, transportation and maintenance crews, and 9-1-1 professionals) to work together as a team to clear incidents safely and quickly. The National Incident Management System (NIMS) integrates best practices into a comprehensive framework for use by emergency management personnel at the local, state, and federal levels. The Incident Command System (ICS) provides the integration of facilities, equipment, personnel, procedures, and communications for emergencies.
• Transportation agencies play a key role in evacuating people out of harm’s way. Recognizing the unique challenges posed by the disaster environment on mobility and the safe and secure movement of people and goods, the Federal Highway Administration (FHWA) produced a primer series titled ROUTES TO EFFECTIVE EVACUATIONS to improve evacuation planning and implementation by bringing to the emergency management community new ways of better using the transportation network before and during evacuations.

Overview of Sections
Section 1 provides an introduction to emergency management. Overall DOT efforts have improved emergency response planning and training since the First Edition of the Guide to Emergency Management was published in 2010. There have been significant advances in emergency management and transportation response planning and recent guidance at the national level reshaping the focus and long-term directions of transportation agencies. It includes information to assist transportation agencies in understanding the impact of shift in focus from protection of assets to resilience of systems.

Section 2 provides an overview of the current state of emergency management and the institutional context for emergency management. It includes a summary of what emergency management is and places it in the context of preparedness and the objectives of the National Preparedness Framework. It summarizes the emergency management legal authorities and the current national frameworks, strategies and guidance related to emergency management.
Section 3 discusses all-hazards emergency management and provides a summary of the hazards and threats that affect transportation systems and the typical impact of each hazard. Hazards include space weather and cyber threats.

Section 4 discusses the components of an emergency management program including cross-cutting capabilities – planning, staffing, communication, and collaboration – along with the mission areas of the National Preparedness Framework – protection, preparation, mitigation, response, and recovery.

Section 5 provides an overview of the significant role transportation agencies have in emergency management and identifies functions, roles, and responsibilities of all stakeholders, including MPOs, required over the continuum of emergencies (i.e., planned activities, minor incident, major incident, hazardous materials incident, natural disaster, and terrorist incident).

Section 6 contains information on developing and maintaining an effective emergency management transportation agency workforce. It also provides an overview of training available, methods of training delivery for employees, and information on full-scale exercises and drills.

Appendix A is a resource guide with resources and tools for transportation agencies to use in supporting their emergency management responsibilities.

Appendix B contains case studies from state DOT organizations.

Appendix C contains acronyms, abbreviations, and initialisms.

Appendix D is a glossary of key terms used in emergency management.

Appendix E consists of an Annotated Bibliography of information sources.

Section 2: Institutional Context for Emergency Management

What is Emergency Management

The discipline known today as Emergency Management has evolved over time. FEMA Course IS-0230.d: Fundamentals of Emergency Management adopts the International Association of Emergency Managers (IAEM) definition for emergency management: “The managerial function charged with creating the framework within which communities reduce vulnerability to threats/hazards and cope with disasters.”

Emergency management has been contextualized in many forms. Frequently Emergency or Disaster Preparedness and Emergency Management have been considered to be interchangeable terms; however, in the strictest sense “preparedness” describes a process designed to ensure that the response to an incident or emergency is effectively coordinated. FEMA defines Preparedness as “a continuous cycle of planning, organizing, training, equipping, exercising, evaluating, and taking corrective action in an effort to ensure effective coordination during incident response.” In contrast, Emergency Management is a programmatic activity that encompasses a comprehensive approach to building and sustaining capabilities focused towards a pre-designated set of risk-based EM categories – “prevent, protect against, mitigate, respond to, and recover from”, threats and hazards.

In the transportation industry, maintaining an effective emergency management function is both a daily business requirement and a strategic enterprise-wide risk management responsibility. Emergency management is needed in all modes of transportation – highway, rail, public transit, pipeline, aviation and maritime. Typically, the robustness of a transportation agency’s emergency management program is determined by the interrelatedness of the established framework, both to other modes, as well as to other interdependent functions that comprise the whole of community services – such as public health, public works, and communications.

Emergency Management has also been impacted by its interface with security. Terms such as critical infrastructure protection, threats vs. hazards, “all-hazards”, and now “resilience” have transcended the field of emergency preparedness and the discipline of emergency management, creating differing sets of accountabilities for various kinds of incidents or emergencies.

Maintaining the focus on the full set of emergency management categories – prevent, protect against, mitigate, respond to, and recover from, – resolves the process-oriented confusion over these terms. Emergency management’s programmatic approach addresses the outcomes, impacts or consequences of events, therefore it is irrelevant whether the incident or emergency was caused by the intentional act of an individual (threat based) or by an act of nature or by an accident (hazard based). Similarly, both an all-hazards and a resilient approach to emergency management is accomplished by managing across the full set of emergency management categories.
Emergency Management Principles
The FEMA Emergency Management Institute's Higher Education Project working group identified the following eight principles:

1. **Comprehensive** – Emergency managers consider and take into account all threats/hazards, all phases, all stakeholders, and all impacts relevant to disasters.
2. **Progressive** – Emergency managers anticipate future disasters and take protective, preventive, and preparatory measures to build disaster-resistant and disaster-resilient communities.
3. **Risk-Driven** – Emergency managers use sound risk management principles (threat/hazard identification, risk analysis, and impact analysis) in assigning priorities and resources.
4. **Integrated** – Emergency managers ensure unity of effort among all levels of government and all elements of a community.
5. **Collaborative** – Emergency managers create and sustain broad and sincere relationships among individuals and organizations to encourage trust, advocate a team atmosphere, build consensus, and facilitate communication.
6. **Coordinated** – Emergency managers synchronize the activities of all relevant stakeholders to achieve a common purpose.
7. **Flexible** – Emergency managers use creative and innovative approaches in solving disaster challenges.
8. **Professional** – Emergency managers value a science- and knowledge-based approach based on education, training, experience, ethical practice, public stewardship, and continuous improvement.

Types of Incidents and Events
An emergency may consist of a short duration, simple, static and singular incident; or it may be prolonged, complex, and dynamic, impacting multiple fronts and requiring deployment of extensive assets and resources. An incident is an occurrence, regardless of cause, that requires response actions to prevent or minimize loss of life, or damage to property and/or the environment. A traffic incident is an emergency road user occurrence, a natural disaster, or other unplanned event that affects or impedes the normal flow of traffic.

The term “all hazards” includes a broad range of incidents and events that have the potential to impact transportation systems. Table 1 provides an overview of various incidents ranging from minor to catastrophic and planned events. The more severe categories of incidents are those more commonly associated with emergencies.
<table>
<thead>
<tr>
<th>Level</th>
<th>Definition</th>
<th>Typical Cause</th>
<th>Typical Duration</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planned Activities</td>
<td>Planned special events, recurring or nonrecurring</td>
<td>Entertainment, sports, social, political</td>
<td>Hours to weeks</td>
<td>Generally a controlled event, serious incidents may be a by-product becoming one of the next levels.</td>
</tr>
<tr>
<td>Minor Incident</td>
<td>An incident generally resolved by local agencies</td>
<td>Minor-moderate traffic, minor flooding or fires</td>
<td>Minutes to several hours</td>
<td>ICS should be followed, albeit in these cases generally on a small-scale basis. This would include traffic incidents at the 1–2 levels.</td>
</tr>
<tr>
<td>Major Incident</td>
<td>An incident requiring multiple jurisdictions/agencies</td>
<td>Major traffic, suicide attempt, major non-HAZMAT spill</td>
<td>Hours to days</td>
<td>This would likely warrant a scaled-up response, including the formal creation of a command post and strict ICS/UC. This would include traffic incidents at levels 2–3.</td>
</tr>
<tr>
<td>HAZMAT Incident</td>
<td>Any incident involving a HAZMAT-qualified response</td>
<td>HAZMAT spill</td>
<td>Hours to days</td>
<td>This is a special category and may have long-term effects if contamination is involved.</td>
</tr>
<tr>
<td>Natural Disaster</td>
<td>Any naturally occurring major emergency</td>
<td>Weather, agricultural, earthquake, pandemic, wildfires</td>
<td>Days to months</td>
<td>These will generally require the full implementation of ICS with activation of EOC(s), perhaps even State EOC(s).</td>
</tr>
<tr>
<td>Terrorist Incident</td>
<td>A human-perpetrated major emergency</td>
<td>CBRNE</td>
<td>Days to months</td>
<td>Same as above.</td>
</tr>
<tr>
<td>Catastrophic</td>
<td>Extraordinary levels of mass casualties, damage, or disruption severely affecting the population, infrastructure, environment, economy, national morale, and/or government functions</td>
<td>Any of the foregoing on a massively destructive or threatening scale</td>
<td>Months to years</td>
<td>These may have any of the previous levels as the genesis. Multiple state EOC activations are probable as well as a highly populated ICS.</td>
</tr>
</tbody>
</table>
As the degree of complexity of an incident increases, so does the coordination required for the typical response. Figure 1 illustrates typical patterns of response for different scales of incidents.

![Figure 1: Agency Involvement by Incident Level for State Transportation Agencies (STAs) and agencies. Source: NCHRP 525 Vol. 6, Security Guide for Emergency Transportation Operations](image)

**Emergency Management Authorities**

**Federal and State Emergency Management Requirements**

The federal government requires State DOTs to incorporate principles and concepts of national initiatives that provide common approaches to incident management and response in emergency response plans and operations. New federal guidance issued since 2010 has resulted in a need to re-examine requirements for state transportation agency planning and response functions, role and responsibilities. For example, the Fixing America’s Surface Transportation (FAST) Act, enacted in 2015, amends Section 5303 of the United States Code to include the word “resilient” in the guidance for Metropolitan and Statewide Transportation Planning.

Also, because other local, state and federal agencies may be involved along with a transportation agency in emergency response, there is a need to review and understand the specific requirements, procedures and protocols that have been established for managing emergencies and coordinating between different roles and responsibilities amongst different agencies, including the coordination role of Metropolitan Planning Organizations (MPOs). As an example, the FAST Act encourages MPOs to consult with State agencies that plan...
for natural disaster risk reduction to produce plans that include strategies to reduce the vulnerability to natural events.

At the federal level, public laws are the governing authorities for other directives, policies, and guidance. Figure 2 illustrates this relationship.

Figure 2: National Emergency Management Policies and Guidelines
Public Laws Governing Emergency Management

The key federal laws implementing Emergency Management policy are:

Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5122)¹

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 100-707) created the system in place today by which a Presidential disaster declaration triggers financial and physical assistance through FEMA. The Stafford Act:

- Covers all hazards, including natural disasters and terrorist events.
- Provides primary authority for the Federal Government to respond to disasters and emergencies.
- Gives FEMA responsibility for coordinating Government response efforts. The President’s authority is delegated to FEMA through separate mechanisms.
- Describes the programs and processes by which the Federal Government provides disaster and emergency assistance to State and local governments, tribal nations, eligible private nonprofit organizations, and individuals affected by a declared major disaster or emergency.

Under the Stafford Act, the President can designate an incident as an “Emergency” or “Major Disaster”. The President may declare an “emergency” unilaterally, but may only declare a “major disaster” at the request of a Governor or tribal Chief Executive who certifies that the State or tribal government and affected local governments are overwhelmed.

The Federal assistance available for emergencies is more limited than that which is available for a major disaster. Emergencies are “Any natural catastrophe (including any hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought), or, regardless of cause, any fire, flood, or explosion, in any part of the United States, which in the determination of the President causes damage of sufficient severity and magnitude to warrant major disaster assistance to supplement the efforts and available resources of States, tribal governments, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering”.

Major disasters may be caused by such natural events as floods, hurricanes, and earthquakes. Disasters may include fires, floods, or explosions that the President feels are of sufficient magnitude to warrant Federal assistance.

Emergency Management Assistance Compact (EMAC) (PL-104-321, 1996)²

EMAC is a national interstate mutual aid agreement that enables states to share resources during times of disaster. Since the 104th Congress ratified the compact, EMAC has grown to become the nation’s system for providing mutual aid through operational procedures and protocols that have been validated through experience. EMAC is administered by NEMA, the National Emergency Management Association, headquartered in Lexington, KY.

EMAC acts as a complement to the federal disaster response system, providing timely and cost-effective relief to states requesting assistance from assisting member states who understand the needs of jurisdictions that

are struggling to preserve life, the economy, and the environment. EMAC can be used either in lieu of federal assistance or in conjunction with federal assistance, thus providing a "seamless" flow of needed goods and services to an impacted state. EMAC further provides another venue for mitigating resource deficiencies by ensuring maximum use of all available resources within member states' inventories.

The thirteen (13) articles of the Compact sets the foundation for sharing resources from state to state that has been adopted by all 50 states, the District of Columbia, the U.S. Virgin Islands, and Puerto Rico.

**Post-Katrina Emergency Management Reform Act of 2006 (PKEMRA)**

Hurricane Katrina in August 2005 was the most devastating natural disaster in U.S. history. Gaps that became apparent in the response to that disaster led to the Post-Katrina Emergency Management Reform Act of 2006 (PKEMRA). PKEMRA significantly reorganized FEMA, provided it substantial new authority to remedy gaps in response, and included a more robust preparedness mission for FEMA. This act:

- Establishes a Disability Coordinator and develops guidelines to accommodate individuals with disabilities.
- Establishes the National Emergency Family Registry and Locator System to reunify separated family members.
- Coordinates and supports precautionary evacuations and recovery efforts.
- Provides transportation assistance for relocating and returning individuals displaced from their residences in a major disaster.
- Provides case management assistance to identify and address unmet needs of survivors of major disasters.

**Sandy Recovery Improvement Act of 2013 (P.L. 113-2)**

The Sandy Recovery Improvement Act of 2013 (P.L. 113-2) authorizes several significant changes to the way FEMA may deliver disaster assistance under a variety of programs. Key changes relate to the following:

- Authorizing alternative procedures for the Public Assistance (PA) Program.
- Reviewing and evaluating the Public Assistance small project threshold.
- Establishing a nationwide dispute resolution pilot program for Public Assistance projects.
- Streamlining the Hazard Mitigation Grant Program (HMGP).
- Developing a national strategy to reduce costs from future disasters
- Revising the factors considered when evaluating the need for the Individual Assistance Program in a major disaster or emergency.
- Authorizing the lease and repair of rental units for use as direct temporary housing.
- Establishing a unified and expedited interagency environmental and historic preservation process for disaster recovery projects.
- Authorizing changes in the way certain government employees are reimbursed for performing emergency protective measures.
- Amending the Stafford Act to allow the Chief Executive of a federally recognized Indian tribe to make a direct request to the President for a major disaster or emergency declaration. Tribes may elect to receive assistance under a State’s declaration, provided that the President does not make a declaration for the tribe for the same incident.

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The Act also:

- Authorizes the President to establish criteria to adjust the non-federal cost share for an Indian tribal government consistent to the extent allowed by current authorities.
- Requires FEMA to consider the unique circumstances of tribes when it develops regulations to implement the provision.
- Amends the Stafford Act to include federally recognized Indian tribal governments in numerous references to State and local governments within the Stafford Act.

Other key transportation industry federal laws that impact emergency management requirements include:

1. The *Fixing America’s Surface Transportation (FAST) Act*, the current transportation reauthorization legislation, which expands the focus on the resiliency of the transportation system. “It is in the national interest to encourage and promote the safe and efficient management, operation, and development of resilient surface transportation systems that will serve the mobility needs of people and freight and foster economic growth and development within and between States and urbanized areas through metropolitan and statewide transportation planning processes.” It requires strategies to reduce the vulnerability of existing transportation infrastructure to natural disasters and expands the scope of consideration of the metropolitan planning process to include improving transportation system resiliency and reliability.

2. The *Moving Ahead for Progress in the 21st Century Act (MAP–21)*, the previous transportation reauthorization legislation, which focused on performance management and established a series of national performance goals. The goals related to safety, congestion reduction, freight movement and economic vitality and environmental sustainability are of particular relevance to emergency management. MAP-21 also required incorporating performance goals, measures, and targets into transportation planning.

**Presidential Directives**

The Homeland Security Presidential Directives (HSPDs), Presidential Policy Directives (PPDs) and Executive Orders are directive in nature and must be implemented in other formats, generally policy documents and/or guidelines. The requirements of these directives and implementing mechanisms are voluntary to state, territorial, tribal, and local governments (but note that typically the entity must comply to qualify for federal disaster relief compensation). Indeed, the HSPDs provide specific schedules for incremental compliance. The relevant presidential directives are as follows:

1. HSPD-5, Management of Domestic Incidents—created the National Incident Management System and the National Response Plan (the latter was later replaced by the National Response Framework), as shown in Figure 2.
2. HSPD-7, Infrastructure Identification, Prioritization, and Protection—led to the National Infrastructure Protection Plan (NIPP).
3. HSPD-8, National Preparedness—led to creation of a National Preparedness Goal, which was implemented in the form of the National Preparedness Guidelines (NPG) document and several other guidelines. PPD-8 links together national preparedness efforts using the following key elements:

4. PPD-21, Critical Infrastructure Security and Resilience—focuses on the need for secure critical infrastructure that can withstand and rapidly recover (resilient) from all hazards.

5. Executive Order 13636: Improving Critical Infrastructure Cybersecurity—provides a technology-neutral cybersecurity framework and means to promote the adoption of cybersecurity practices.

6. Executive Order 13653, Preparing the United States For The Impacts Of Climate Change— requires federal agencies to integrate considerations of the challenges posed by climate change effects into their programs, policies, rules and operations to ensure they continue to be effective, even as the climate changes.

National Emergency Management Policies and Guidelines

National Incident Management System (NIMS)
NIMS created a national standard system for federal, state, tribal, and local governments to work together to prepare for, and respond to, incidents affecting lives and property. It presents and integrates accepted practices proven effective over the years into a comprehensive framework for use by incident management organizations in an all-hazards context. (NIMS, 2008). The following two NIMS companion documents are tailored to transportation professionals:

- FHWA’s Simplified Guide to the Incident Command System for Transportation Professionals (FHWA, 2006a) introduces the Incident Command System (ICS) to stakeholders who could be called upon to provide specific expertise, assistance, or material during highway incidents, but who may be largely unfamiliar with ICS organization and operations.
- I-95 Corridor Coalition’s Supplemental Resource Guide to the National Incident Management System (NIMS) for Transportation Management Center Professionals. (I-95CC, 2008)

National Infrastructure Protection Plan (NIPP)
National Infrastructure Protection Plan 2013 Partnering for Critical Infrastructure Security and Resilience emphasizes the importance of resilience, the need to reduce all-hazards vulnerabilities and mitigate potential consequences of incidents or events that do occur. The NIPP 2013 has six chapters, two appendices, and four supplements. After an Executive Summary, the Introduction (Chapter 1) gives an overview of the NIPP 2013 and its evolution from the 2009 NIPP. Chapter 2 defines the Vision, Mission, and Goals of the NIPP 2013, while Chapter 3 describes the Critical Infrastructure Environment in terms of key concepts, risk, policy, operations, and partnership. Core Tenets are established in Chapter 4. Ways to collaborate to manage risk are given in Chapter 5. The final chapter is a Call to Action (“Steps to Advance the National Effort”). The Sector-Specific Plans of the 16 critical infrastructure sectors are being updated to align with the NIPP 2013. The web page for NIPP 2013 also contains links to training courses, critical infrastructure partnership courses, security awareness courses, and the relevant authorities (i.e. laws, regulations, and guidance).

National Preparedness Framework
The National Preparedness Goal (2015) is a “A secure and resilient nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk.” The following changes were made to the National Preparedness Goal document:

- Language added to stress the importance of community preparedness and resilience.
• The Risk and the Core Capabilities were enhanced to include items on cybersecurity and climate change.
• A new core capability, Fire Management and Suppression, was added.
• Core capability titles were revised:
  • Threats and Hazard Identification (Mitigation) – revised to Threats and Hazards Identification;
  • Public and Private Services and Resources (Response) – revised to Logistics and Supply Chain Management;
  • On-scene Security and Protection (Response) – revised to On-scene Security, Protection, and Law Enforcement;
  • Public Health and Medical Services (Response) – revised to Public Health, Healthcare, and Emergency Medical Services.

National Preparedness Guidelines (NPG) implement the National Preparedness Goal called out in HSPD-8, National Preparedness (NPG, 2007). It introduces a number of capabilities based planning tools, including:
• National Planning Scenarios are a diverse set of 15 high-consequence threat scenarios for potential terrorist attacks and natural disasters that form the basis for coordinated federal planning, training, exercises, and grant investments needed to prepare for emergencies of all types. The scenarios include 12 chemical, biological, radiation, nuclear, and explosive weapons (CBRNE) threats; a cyber-attack; a Category 5 hurricane; and an earthquake.
• Target Capabilities List (TCL) defines 37 specific capabilities that communities, the private sector, nongovernment agencies, and all levels of government should collectively possess in order to respond effectively to disasters.
• Universal Task List (UTL) is a series of 1,600 unique tasks that can facilitate efforts to prevent, protect against, respond to, and recover from the events represented by the National Planning Scenarios. It presents a common vocabulary and identifies key tasks that support development of essential capabilities among organizations at all levels. No entity will perform every task.

The National Response Framework (NRF) replaced the earlier National Response Plan and was expanded in scope, audience, and breadth (NRF, 2008). The NRF is the definitive guide for Emergency Response and delineates the nation’s response doctrines, responsibilities, and structures. It embraces NIMS and updates the Emergency Support Function (ESF) descriptions. There are several important companion documents to the NRF:
• ESF Annexes define the stakeholders and their roles and responsibilities, purpose, capabilities, and concept of operations for the 15 ESFs. These are critical to effective ER planning; state/local versions adapted to state and local conditions are typically included in EOPs.
• Support Annexes are a separate set of annexes that describe how federal departments and agencies; state, territorial, tribal, and local entities; the private sector; volunteer organizations; and nongovernmental organizations (NGOs) coordinate and execute the common functional processes and administrative requirements for efficient and effective incident management. They may support several ESFs.
• Incident Annexes are a separate set of annexes that describe the concept of operations to address specific contingency or hazard situations or an element of an incident requiring specialized application of the Framework.
The National Disaster Recovery Framework describes “how the whole community works together to restore, redevelop, and revitalize the health, social, economic, natural, and environmental fabric of the community.” The new Framework incorporates the edits to the National Preparedness Goal and new lessons learned. Additional changes made to the Framework include:

- Increased focus on Recovery's relationship with the other four mission areas.
- Updated Recovery Support Functions (RSFs) to reflect changes in Primary Agencies and Supporting Organizations.
- Additional language on science and technology capabilities and investments for the rebuilding and recovery efforts.”

The National Mitigation Framework covers the capabilities necessary to reduce the loss of life and property by lessening the effects of disasters, and focuses on risk (understanding and reducing it), resilience (helping communities recover quickly and effectively after disasters), and a culture of preparedness. The new Framework incorporates the edits to the National Preparedness Goal and new lessons learned including a revised core capability title, Threats and Hazards Identification. Additional language was added on science and technology efforts to reduce risk and analyze vulnerabilities within the mitigation mission area. There were updates on the Mitigation Framework Leadership Group (MitFLG), which is now operational, and to the Community Resilience core capability definition “to promote preparedness activities among individuals, households and families.”

The National Protection Framework focuses on “actions to deter threats, reduce vulnerabilities, and minimize the consequences associated with an incident.” The new Framework incorporates the edits to the National Preparedness Goal and new lessons learned. In addition, the following changes have been made:

- Updated Cybersecurity Core Capability Critical Tasks to align with the Mitigation, Response, and Recovery Mission Areas.
- Additional language on science and technology investments to protect against emerging vulnerabilities is included within the protection mission area.
- Additional language on interagency coordination was added within the protection mission area to support the decision-making processes outlined within the framework.

The National Prevention Framework focuses on terrorism and addresses the capabilities necessary to avoid, prevent, or stop imminent threats or attacks. Some core capabilities overlap with the Protection mission area. The updates include edits to the Nation Preparedness Goal, and lessons learned. Other edits include:

- Updates to Coordinating Structure language on Joint Operations Centers and the Nationwide Suspicious Activity Reporting Initiative.
- Clarification on the relationship and differences between the Prevention and Protection mission areas.
- Updated language on the National Terrorism Advisory System (NTAS) as part of the Public Information and Warning core capability.
- Additional language on science and technology investments within the prevention mission area.
Section 3: Nature and Degree of Hazards/Threats

An all-hazards approach to emergency management includes a broad range of incidents and events that have potential to impact transportation agencies and/or transportation systems operations. States across the nation face different types of hazards. Coastal states can be at risk from hurricanes, tsunamis, storm surge and sea level rise. Wide corridors of the central part of the country are tornado alleys, with a far higher probability of these storms occurring. Southwestern states experience severe heat, flash floods and dust storms. Mountain states experience landslides and avalanches, and much of the country experiences snow and ice storms – with different degrees of severity and different levels of preparedness for such events. All rivers, large and small, are potential flooding disasters. Earthquakes are not restricted to the west coast. There are seismic faults in many states that are overdue and there are frequent seismic events in states such as Oklahoma that did not experience any in the past. States throughout the nation are prone to forest and grassland wildfires.

Along with natural hazards, technological hazards such as cyber incidents and those related to aging infrastructure need to be addressed as part of an all-hazards approach. Because today’s transportation systems are integrated cyber and physical systems, there are greater cyber risks than ever, including the risk of a cyber incident impacting not only data, but the control systems and physical infrastructure of transportation agencies.

Range of Hazards

The latest Strategic National Risk Assessment stated that the Nation continues to face a wide range of threats and hazards including the following:

- Natural hazards, including hurricanes, earthquakes, tornadoes, droughts, wildfires, winter storms, and floods, affect various parts of the Nation; climate change may increase the severity of their impacts.

- A virulent strain of pandemic influenza or human and animal infectious diseases could cause significant loss of life and economic loss.

- Technological and accidental hazards, such as transportation system failures, dam failures, chemical spills or releases, may result in extensive fatalities and severe economic impacts, and may increase due to aging infrastructure.

- Terrorist organizations or affiliates may seek to acquire and use weapons of mass destruction (WMD). At the same time, conventional terrorist threats such as “lone actors” using explosives and armed attacks persist.

- Cyber-attacks have the potential to cause cascading impacts with catastrophic consequences and can threaten the Nation’s security, economy, public safety and health. Also, cybersecurity is an important core capability and cyber preparedness needs to be integrated into every core capability.

(NPG, 2015)
Typical hazards and threats facing state transportation agencies and others are shown in Table 2.

Table 2: Sample Hazards and Threats List.

<table>
<thead>
<tr>
<th>Natural Hazards</th>
<th>Technological Hazards</th>
<th>Human-Caused Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avalanche</td>
<td>Airplane crash</td>
<td>Civil disturbance</td>
</tr>
<tr>
<td>Drought</td>
<td>Bridge collapse</td>
<td>School violence</td>
</tr>
<tr>
<td>Earthquake</td>
<td>CBRNE</td>
<td>Terrorist or criminal act</td>
</tr>
<tr>
<td>Epidemic</td>
<td>Dam or levee failure</td>
<td>Sabotage</td>
</tr>
<tr>
<td>Flood</td>
<td>Electromagnetic pulse</td>
<td>War related</td>
</tr>
<tr>
<td>Hurricane (tropical cyclone)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landslide or mudslide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tornado</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tsunami (or seiche)</td>
<td>HAZMAT release</td>
<td></td>
</tr>
<tr>
<td>Volcanic eruption</td>
<td>Power failure</td>
<td></td>
</tr>
<tr>
<td>Wildfire or facility fire</td>
<td>Radiological release</td>
<td></td>
</tr>
<tr>
<td>Winter storm</td>
<td>Train derailment</td>
<td></td>
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<tr>
<td>Wind or dust storm</td>
<td>Urban conflagration</td>
<td></td>
</tr>
<tr>
<td>Space weather</td>
<td>Loss of Internet connectivity</td>
<td></td>
</tr>
<tr>
<td>Solar events</td>
<td>Loss of telecommunications</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equipment failure</td>
<td></td>
</tr>
</tbody>
</table>

Adapted from FEMA, Comprehensive Planning Guide 101, 2009; indicates others added by the research team or from other transportation sources.

**Natural Hazards**

Natural hazards span the range of predictability with extreme weather events increasing in frequency (e.g., Superstorm Sandy, extensive Midwest flooding, powerful hurricanes, extensive wildfires). Weather events not only disrupt service, but can also damage infrastructure.

Space-weather events are naturally occurring phenomena in the space environment that have the potential to disrupt technologies and systems in space and on Earth. These phenomena can affect satellite and airline operations, communications networks, navigation systems, the electric power grid, and other technologies and infrastructures critical to the daily functioning, economic vitality, and security of our Nation. Space weather can affect communication and navigation systems that are critical for safe and efficient transportation systems.

For most of the natural hazards, geography is the primary variable in predicting likelihood of events. In many cases, geographic data on hazard likelihood is readily available and can be used with minimal cost or difficulty by appropriately skilled and equipped staff. There may be cases, however, where anecdotal evidence or judgement may need to be relied upon.

The advanced age and deterioration of infrastructure can multiply risks from manmade or natural disasters and make the effects of an event much worse.

**Technological Hazards**

There are a variety of technological hazards that can impact transportation systems. Despite the best efforts of engineering and maintenance, the potential hazard or threat of a structural failure will always exist. Structure failure refers to any decrease in the physical integrity of the transportation asset to bear the weight required to carry passengers or freight. Structural failure may be sudden or gradual. The scope of this hazard or threat may be minimal, such as a crack in the wall requiring remediation or a pavement...
ripple requiring the temporary relocation of traffic. Integrity loss may also be catastrophic, resulting in
total collapse or flooding of a structure, wreaking widespread loss of assets and loss of life.

There is no known method to guarantee that a structure will never fail or deteriorate. Proper design,
construction, and maintenance may drastically decline the likelihood of a sudden failure; however, unseen
tectonic or aquatic forces may go undetected by asset owners. Inconsistencies and lapses in the
design, construction, and maintenance of an asset may collude to create the conditions for a sudden
structural failure.

Hazardous materials (HAZMAT) may be in liquid, solid, or gaseous form. The quantity of material
introduced may be minimal but cause a hazard to users of the transportation system. Hazardous materials
include common industrial cleaners used by transportation workers and canisters of pepper spray set off
by transit users. In both circumstances, it is unlikely that the maintenance worker or the commuter
entered the transportation system with the intent of discharging material into the air. Materials may also
include hazardous liquid, which include debris or waste products moved into the transportation system
by a vehicle, truck, or rail car. All hazardous materials require specialized remediation that will close a
roadway or transit segment to allow processing.

Human Caused Hazards
Vehicle/vessel collisions are a common type of human caused hazards. For this hazard, the specific
concern is the potential for collisions to cause very hot fires that can damage steel or timber
infrastructure. The Federal Motor Carrier Safety Administration maintains detailed statistics on crash
frequencies for large trucks, including tankers and hazardous materials. The frequency of vessel collisions
can be very site specific, depending on the waterway, navigational aids, climate, and maritime traffic.

Terrorists use a wide array of tactics and techniques in conducting an attack including active shooters and
assault by vehicle. Below is a list of the most likely tactics and threats from the terrorists’ perspective:

1. Vehicle borne Improvised Explosive Device (VBIED): These include both landborne vehicles (i.e.
   truck bombs) that would be deployed against components reachable by land and waterborne
   vehicles (i.e. boat bombs) that would be deployed against any components reachable by water.

2. Hand Emplaced Improvised Explosive Device (HEIED): These include contact explosive devices
   such as satchel demolition charges and shaped charges that are commonly used by military
   engineers and civilian demolition experts to precisely cut/sever structural member.

3. Non-Explosive Cutting Device (NECD): These include any non-explosive devices such as saws,
   grinders, and torches that can be used to cut/sever structural members.

4. Vehicular Impact (VI): Similar to the VBIEDs, these include both landborne and waterborne
   vehicles depending on the location of the component of concern.

Interdependencies and Cascading Effects
There are extensive interdependencies among transportation modes and other sectors such as power and
water. For example, the loss of a key bridge or tunnel can disrupt power and communications along with
transportation due to co-located utilities. The transportation disruption can impact passenger and freight
movement, as well as disrupting the supply chain.
Cascading events are events that occur as result of an initial event. For example, wildfires in the dry season can lead to mudslides when the rains come later. Heavy rains can result in dam overflows or failures. A flashflood or lightning strike can disrupt power in an area and shout of traffic control systems, resulting in, a serious traffic accident. If there was HazMat involved and a spill occurs, an evacuation of the area may be necessary.

Because no entity has sufficient resources to protect against every threat and every hazard, state transportation agency investment in preparedness activities is necessarily risk-based. Understanding the dependencies within and between infrastructure and systems along with potential cascading effects are developing areas of emergency management.

**Hazard Data Sources**

Information on potential hazards, including probability and possible effects, can be obtained from the Federal Emergency Management Association (FEMA), State Emergency Management and Civil Defense Agencies, National Weather Service (NWS), Environmental Protection Agency (EPA), U.S. Department of the Interior, U.S. Geological Survey, U.S. Army Corps of Engineers, and Department of Natural Resources (DNR). The following sections describe sources of relevant geographically referenced hazard data:

**Earthquake.** The U.S. Geological Survey (USGS) National Seismic Hazard Maps (Figure 3) display earthquake ground motions for various probability levels across the United States and are applied in seismic provisions of building codes, insurance rate structures, risk assessments, and other public policy. The National Seismic Hazard Maps are derived from seismic hazard curves calculated on a grid of sites across the United States that describe the annual frequency of exceeding a set of ground motions. Data and maps from the 2014 U.S. Geological Survey National Seismic Hazard Mapping Project are available. The USGS Seismic Zone Maps are a probabilistic view (either 2% or 10%) that the ground acceleration will exceed the given value over 50 years. Depending on which model a state used, these would easily translate into the likelihood a state would use for their model.

![USGS National Seismic Hazard Map (USGS 2011)](image)

Maps for available periods (0.2 s, 1 s, PGA) and specified annual frequencies of exceedance can be calculated from the hazard curves. Figures depict probabilistic ground motions with a 2 percent probability of exceedance. Spectral accelerations are calculated for 5 percent damped linear elastic oscillators. All ground motions are calculated for site conditions with Vs30=760 m/s, corresponding to NEHRP B/C site class boundary. There is also a FEMA HAZUS data set for earthquakes.
Landslide. Some jurisdictions that are especially sensitive to landslides have prepared hazard maps. As an example, hazard mapping will become statewide in Washington State following a 2015 state law (RCW 43.92.025), which also covers earthquake and tsunami. The law specifies LiDAR mapping and specifically requires estimation of likelihood and consequence, but does not mandate other parameters such as return period, leaving such decisions to the State Geologist.

Agencies that have slope inventories may be able to compute the total centerline length of road affected by unstable slopes. The polling method, describes a way that can be used to generate a frequency of landslide incidents. These would be gathered for all roads, and not just bridges. If the total length of slope incidents is divided by the inventory length of slopes and the number of years covered by the poll, this will provide an estimate of landslide probability per foot of road. For a given bridge, multiply this by the total roadway length (on and under the bridge) to give a site-specific extreme event probability.

Agencies that experience debris flows from unstable slopes or freeze/thaw in deteriorating permafrost may identify extreme events associated with these phenomena that would be assessed in the same way as landslides.

Storm surge. Florida DOT conducted an analysis of hurricane risk using a FEMA HAZUS data set of high wind speed (Sobanjo and Thompson 2013). In a GIS this was associated with low elevations and coastal exposure to give an indication of storm surge vulnerability. Sheppard and Miller (2003) developed design storm surge hydrographs for the Florida coast (Figure 4). This report listed recommended values for peak storm surge heights and corresponding likelihoods (50 year, 100 year, and 500 years occurrence) at various locations.

![Storm surge contours in Louisiana](Padgett et al 2008)


High wind. FEMA's HAZUS data set can provide high wind data that can be geographically associated with bridges. The National Weather Service GIS Portal has data on tornado occurrence across the USA.
**Flood.** The Federal Emergency Management Agency (FEMA) maintains the Digital Flood Insurance Rate Map Database, which depicts flood risk information and supporting data used to develop the risk data. The primary risk classifications used are the 1-percent-annual-chance flood event (100 year), the 0.2-percent-annual-chance flood event (500 year), and areas of minimal flood risk. Many state and county governments also maintain flood zone maps, which in many cases provide the basis for the FEMA maps. This information can be associated geographically with bridges to assign flood probabilities.

**Wildfire.** Some states, and the US Forest Service, maintain geographic data sets on historical wildfire experience.

**Extreme temperature.** The National Weather Service maintains maps of extreme temperature events across the nation. This information has been changing rapidly in recent years. The CMIP Climate Data Processing Tool, an Excel based tool developed for FHWA in 2015, utilizes the CMIP 3 and CMIP 5 databases to create usable statistics for transportation planners for temperature and precipitation variables. The FHWA published Regional Climate Change Effects: Useful Information for Transportation Agencies in 2010 that had estimates of temperature, precipitation, sea level and storm activity for every region in the country – northeast, southeast, Midwest, Great Plains, southwest, Pacific Northwest, Alaska, Hawaii and Puerto Rico.

Most of the data sources described here are actively maintained and can change frequently. This makes it important to keep the assessment up-to-date. An updating interval of 4-6 years is suggested for hazards that are addressed in the bridge management system.

In the absence of geographically-referenced data, it may be possible in some cases to rely on anecdotal information, such as from news reports or studies taken from non-transportation domains. For example, the coasts of the Pacific Ocean and Gulf of Mexico have been subject to extensive monitoring and studies of sea level rise, which can be helpful in making judgments about the likelihood of storm surge and tsunami.

Earthquakes of magnitude severe enough to damage transportation systems are reliably reported in the media, so a systematic search may provide sufficient information on strength and frequency. Local knowledge or news reports of floods can form the basis for a localized assessment of flood likelihood, especially in combination with site evidence of past flooding. The same is true of landslides.

On the other hand, tornado and wildfire assessments should not rely on anecdotal reports since they are an unreliable indicator of future event locations.

Other Sources include:


**FEMA Map Service Center**

This Federal Emergency Management Agency source provides map information for a variety of users affected by floods, including homeowners and renters, real estate and flood determination agents, insurance agents, engineers and surveyors, and federal and exempt customers. There are flood maps, databases, map viewers, documents and publications providing comprehensive information. Further aspects of the site include FEMA issued flood maps available for purchase, definitions of FEMA flood
zone designations, and information about FIRMettes, a full-scale section of a FEMA Flood Insurance Rate Map (FIRM) that users can create and print at no charge.

http://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1

**FEMA Flood Map Service Center (MSC)**

The FEMA Flood Map Service Center is the official public source for flood hazard information produced in support of the National Flood Insurance Program (NFIP). The MSC contains official flood maps, access to a range of other flood hazard products, and tools for better understanding flood risk. subsection of

http://msc.fema.gov/portal/

**Interior Geospatial Emergency Management System (IGEMS)**

The Department of Interior Geosciences and Environmental Change Science Center IGEMS, which replaced the Natural Hazards Support System (NHSS), provides online maps containing the latest available information on earthquakes, earthquake shakemaps, streamflow data, floods, volcanoes, wildfires, and weather hazards.

http://igems.doi.gov/

**National Weather Service GIS Data Portal (NOAA)**

Current weather, forecasts and past weather data are available in Shapefile and other formats from the Data Portal. Hazards include tornados, hurricanes, rain, snowfall, floods and other weather related hazards.

http://www.nws.noaa.gov/gis/shapepage.htm

**Advanced Hydrologic Prediction Service (NOAA)**

The NOAA Advanced Hydrologic Prediction Service (AHPS) is a web-based suite of forecast products that displays the magnitude and uncertainty of occurrence of floods or droughts, from hours to days and months, in advance. The majority of the observed water level data displayed on the AHPS web pages originates from the United States Geological Survey's (USGS) National Streamflow Information Program which maintains a national network of stream gauges. In addition, real-time water level information is collected from other federal, state, and local stream gauge networks.

http://www.nws.noaa.gov/oh/ahps/

**Hazard Tools**

There has been, and continues to be, significant deployment of new resources and rapidly developing technologies to support DOT activities such as Shakecast, Floodcast and remote, in-situ, or portable monitoring/damage detection techniques such as sensors, sonar, radar, satellite imagery and unmanned aerial vehicles.

**ShakeCast**

ShakeCast is a tool for raising situational awareness in emergency response. It is an open-source web application that retrieves data within minutes after an earthquake and generates hierarchical lists and
maps of bridges most likely impacted. Notifications are then sent to responders within 10 minutes following the event.

The ShakeCast software conducts an analysis of the measured or interpolated ground motion at each defined bridge location against a pre-determined bridge fragility model. Responders can use the link in the email to access additional information on the ShakeCast website such as viewing bridge data using maps and tables along with fragility analysis results.

ShakeCast can also be used to evaluate current bridge inventory against scenario earthquakes and significant historical events.

Developed by the USGS with support from Caltrans, the latest version V3 was released in 2015.

**FloodCast**

FloodCast is a strategic framework for enhanced flood event decision making. The completed project will help state DOTs manage risks and respond to flood and flash flood events.
Risk Assessment and Threat and Hazard Identification and Risk Assessment (THIRA)
The latest Strategic National Risk Assessment stated that the Nation continues to face a wide range of threats and hazards including:

- Natural hazards, including hurricanes, earthquakes, tornadoes, droughts, wildfires, winter storms, and floods, affect various parts of the Nation; climate change may increase the severity of their impacts.
- A virulent strain of pandemic influenza or human and animal infectious diseases could cause significant loss of life and economic loss.
- Technological and accidental hazards, such as transportation system failures, dam failures, chemical spills or releases, may result in extensive fatalities and severe economic impacts, and may increase due to aging infrastructure.
- Terrorist organizations or affiliates may seek to acquire and use weapons of mass destruction (WMD). At the same time, conventional terrorist threats such as “lone actors” using explosives and armed attacks persist.
- Cyber-attacks have the potential to cause cascading impacts with catastrophic consequences and can threaten the Nation’s security, economy, public safety and health. Also, cybersecurity is an important core capability and cyber preparedness needs to be integrated into every core capability. (NPG, 2015)

The FEMA Comprehensive Preparedness Guide (CPG) 201 presented the basic steps of a Threat and Hazard Identification and Risk Assessment (THIRA) that included a process for identifying community-specific threats and hazards. It addressed setting capability targets for each core capability identified in the National Preparedness Goal; the Second Edition of CPG 201 included an estimation of resources needed to meet those capability targets. The Second Edition CPG 201 also included changes to the THIRA process, streamlining the number of steps to conduct a THIRA and providing additional examples.

THIRA is a foundation of the National Preparedness System. It is a four-step risk assessment process that provides an understanding of risks and helps estimate capability requirements. The THIRA process standardizes the risk analysis process that emergency managers and homeland security professionals use and builds on existing state, local, tribal, and territorial Hazard Identification and Risk Assessments by:

- Broadening the threats and hazards considered to include human-caused threats and technological hazards.
- Incorporating the whole community into the planning process, including individuals; families; businesses; faith-based and community organizations; nonprofit groups; schools and academia; media outlets; and all levels of government, including local, state, tribal, territorial, and Federal partners.
- Providing increased flexibility to account for community-specific factors.
Figure 5: The THIRA Process

The THIRA Process

1. Identify Threats and Hazards of Concern: Based on a combination of experience, forecasting, subject matter expertise, and other available resources, identify a list of the threats and hazards of primary concern to the community.

2. Give the Threats and Hazards Context: Describe the threats and hazards of concern, showing how they may affect the community.

3. Establish Capability Targets: Assess each threat and hazard in context to develop a specific capability target for each core capability identified in the National Preparedness Goal. The capability target defines success for the capability.

4. Apply the Results: For each core capability, estimate the resources required to achieve the capability targets through the use of community assets and mutual aid, while also considering preparedness activities, including mitigation opportunities.
Table 3. Example template for organizing THIRA information.
Section 4. Develop an Emergency Preparedness Program

This section explains the emergency planning process and the all-hazards approach to emergency management; it also emphasizes that the process is a continuous one, not something done once and then shelved. In the overall emergency management/risk management, all-hazards approach, the state transportation agency has two distinct roles: (1) developing and maintaining its own Emergency Operations Plan (EOP) and (2) supporting the State EOP. EOPs are closely connected to planning efforts in the programmatic areas of emergency management.

There are many ways to develop an emergency management plan. FEMA’s Comprehensive Preparedness Guide 101 Version 2.0 (CPG 101, 2010), Developing and Maintaining Emergency Operations Plans provides FEMA guidance on the fundamentals of planning and developing Emergency Operations Plans (EOPs). The planning steps to develop an EOP are appropriate to developing other required plans to cover the five programmatic areas discussed in Section 2 (Prevent, Protect, Mitigate, Respond, and Recover). This chapter thus provides transportation-sector specific guidance towards building and sustaining capabilities focused towards the pre-designated set of risk-based EM categories – “prevent, protect against, mitigate, respond to, and recover from”, threats and hazards, through development and ongoing maintenance of the Emergency Operations Plan.

The planning process laid out in Chapter 4 of CPG 101, version 2 (see Figure 6) is used in this chapter as a suggested framework to develop the EOP (the Plan). The planning process “merges information from the first three chapters [of CPG 101] and describes an approach for operational planning that is consistent with processes already familiar to most planners. When the planning process is used consistently during the preparedness phase, its use during operations becomes second nature. The goal is to make the planning process routine across all phases of emergency management and for all homeland security mission areas.”
Figure 6. Steps in the planning process.

CPG 101 version 2 (2010) emphasizes the following 14 principles of effective emergency planning:

1. Planning must be community-based, representing the whole population and its needs.
2. Planning must include participation from all stakeholders in the community.
3. Planning uses a logical and analytical problem-solving process to help address the complexity and uncertainty inherent in potential hazards and threats.
4. Planning considers all hazards and threats.
5. Planning should be flexible enough to address both traditional and catastrophic incidents.
6. Plans must clearly identify the mission and supporting goals (with desired results).
7. Planning depicts the anticipated environment for action.
8. Planning does not need to start from scratch.
9. Planning identifies tasks, allocates resources to accomplish those tasks, and establishes accountability.
10. Planning includes senior officials throughout the process to ensure both understanding and approval.
11. Time, uncertainty, risk, and experience influence planning.
12. Effective plans tell those with operational responsibilities what to do and why to do it, and they instruct those outside the jurisdiction in how to provide support and what to expect.
13. Planning is fundamentally a process to manage risk.
14. Planning is one of the key components of the preparedness cycle.
Planning Process

The planning steps in this section focus on the plan element of the preparedness cycle, and also reference or incorporate other elements of the preparedness cycle. The preparedness cycle includes five key phases- Plan, Organize/ Equip, Train, Exercise, Evaluate/Improve- and is part of the National Preparedness System, as illustrated in Figure 7 from FEMA.

The planning structures and templates are intended to assist in the process of developing / updating state DOT emergency plans so they are useful for the DOT in working with the state and with other stakeholders in preparing for and responding to emergencies.

The process described in the six steps of the CPG 101 Planning Process chapter is geared towards helping an agency develop an Emergency Operations Plan that will carry through the preparedness and operational phases of an emergency. The same six steps of the process to develop an EOP (form a collaborative planning team, understand the situation, determine goals and objectives, plan development, plan preparation, review and approval, and plan implementation and maintenance) are intended to be replicated in developing other plans.

CPG 101 v.2 describes other plans besides the EOP to fully address the Prevent, Protect, Mitigate, Respond, and Recover programmatic areas as follows. The information in brackets and italics [text] summarizes how these other plans are addressed in this guide and chapter. Note that only the Planning section in this chapter (the first section) strictly adheres to the six planning steps of CPG 101. Other sections (preparedness, mitigation, response and recovery) are expected to include some of the same planning members, scenarios, and response strategies. The planning steps for these latter sections are therefore abbreviated to focus on specific elements related to the phase.

Additional Types of Plans

As described in CPG 101, version 2, and as well-known to DOTs and emergency managers, “emergency operations involve several kinds of plans, just as they involve several kinds of actions. While the EOP is often the centerpiece of emergency planning efforts, it is not the only plan that addresses emergency management or homeland security missions. There are other types of plans that support and supplement the EOP and its annexes.

“Joint Operational Plans or Regional Coordination Plans typically involve multiple levels of government to address a specific incident or a special event. These plans should be developed in a manner consistent with [CPG 101 v.2] and included as an annex or supplemental plan to the EOP, depending on the subject of the plan. Standing plans should be an annex to the related EOPs, while special events plans should be stand-alone supplements based on the information contained within the related EOPs.” [Joint Operational Plans or Regional Coordination Plans are not specifically addressed in this Chapter and Guide, although the need for such coordination is identified at various junctures. The reference NCHRP Report 740, A
Transportation Guide for All-Hazards Evacuation, has extensive operational information related to joint operations, and a template tool for such coordination; NCHRP Report 777, Regional Transportation Planning for Disasters, Emergencies and Significant Events provides principles and case studies for such coordination. This is discussed in more detail in Section 5 of this Guide.]

“Administrative plans describe basic policies and procedures to support a governmental endeavor. Typically, they deal less with external work products than with internal processes...Such plans are not the direct concern of an EOP. However, planners should reference the administrative plan in the EOP if its provisions apply during an emergency. Planners should make similar references in the EOP for exceptions to normal administrative plans permitted during an emergency.” [Administrative plans are not specifically addressed in this Chapter and Guide.]

“Preparedness plans address the process for developing and maintaining capabilities for the whole community both pre- and post-incident. Preparedness plans should address capabilities needed for prevention, protection, response, recovery, and mitigation activities. These plans include the schedule for identifying and meeting training needs based on the expectations created by the EOP; the process and schedule for developing, conducting, and evaluating exercises and correcting identified deficiencies; and plans for procuring, retrofitting, or building facilities and equipment that could withstand the effects of the hazards facing the jurisdiction.” [Key elements of preparedness plans are addressed in the Preparedness section of this chapter.]

“Continuity plans outline essential functions that must be performed during an incident that disrupts normal operations and the methods by which these functions will be performed. They also describe the process for timely resumption of normal operations once the emergency has ended. Continuity of Operations (COOP) plans address the continued performance of core capabilities and critical operations during any potential incident. Continuity of Government (COG) plans address the preservation and/or reconstitution of government to ensure that constitutional, legislative, and/or administrative responsibilities are maintained.” [Continuity plans are not specifically addressed in this Guide.]

“Recovery plans developed prior to a disaster enable jurisdictions to effectively direct recovery activities and expedite a unified recovery effort. Pre-incident planning performed in conjunction with community development planning helps to establish recovery priorities, incorporate mitigation strategies in the wake of an incident, and identify options and changes that should be considered or implemented after an incident. Post-incident community recovery planning serves to integrate the range of complex decisions in the context of the incident and works as the foundation for allocating resources.” [Recovery plans are briefly addressed in the Recovery section of this chapter.]

“Mitigation plans outline a jurisdiction’s strategy for mitigating the hazards it faces... Mitigation planning is often a long-term effort and may be part of or tied to the jurisdiction’s strategic development plan or similar documents. Mitigation planning committees may differ from operational planning teams in that they include zoning boards, floodplain managers, and individuals with long-term cultural or economic interests. Existing plans for mitigating hazards are relevant to an EOP since both originate from a hazard-based analysis and share similar component requirements.”

“Prevention and protection plans typically tend to be more facility focused and procedural or tactical in their content” according to CPG 101, version 2. [Specific aspects of prevention and protection plans are
not otherwise addressed in this Guide. See Security 101: A Physical and Cybersecurity Primer for Transportation Agencies.]

**Procedural Documents**

In addition to operational planning documents and procedures, DOT divisions, regions and districts will require tactical plans and procedures on how to carry out the operational guidance. (See Figure 8.)

“Procedural documents describe how to accomplish specific activities needed to finish a task or achieve a goal or objective. Put simply, plans describe the “what” and procedures describe the “how.” Planners should prepare procedural documents to keep the plan free of unnecessary detail. The basic criterion is: What does the audience of this part of the plan need to know or have set out as a matter of public record? Information and how-to instructions used by an individual or small group should appear in procedural documents. The plan should reference procedural documents as appropriate.” [This Guide does not specifically address Procedural documents.]

Steps in this chapter are designed to help the DOT emergency management coordinator and related DOT stakeholders through the process of updating the emergency response plan to a full emergency management plan, or creating an emergency management plan from scratch. Self-assessments and collaboration are essential elements of both processes. This chapter replicates some of the detail from the 2010 Guide, including the FEMA emphasis on whole community planning and capabilities. Because the planning and preparedness phases are perhaps the best way to maximize the success and safety of the response and recovery efforts, these sections provide greater detail. Self-assessment checklists are included in Appendix A. Cross-references to other sections, such as the section on Stakeholders and the new section on training, are also provided.

Finally, as agencies begin this process, it is important to reinforce that this is not a standard. This is a suggested process derived from the relevant national directives, policies, and guidelines introduced in Sections 1 and 2. Even the Comprehensive Preparedness Guideline 101 is just that—a guideline. The discussions below do not attempt to replace or unnecessarily duplicate CPG 101, although some reference and duplication are necessary. More significantly, the 2017 Guide attempts to fill in gaps unique to transportation that are not explicit in CPG 101 and provides a means for state transportation agencies to perform self-assessments of their own emergency planning, preparedness, mitigation,
response, and recovery processes. As noted in paragraph 1 of this section the prime directives for the DOT are (1) developing and maintaining its own EOP and (2) supporting the state EOP.

**Emergency Planning Phase**

The planning phase is arguably the most important step in developing and administering an effective emergency preparedness program. Without proper planning, emergency response personnel can easily find themselves significantly hampered by the confusion and contradictory actions often encountered during complex emergency response activities. As state transportation agencies assume greater levels of responsibility for managing large-scale evacuations in response to natural disasters, as well as no-notice evacuations, shelter-in-place, or quarantine in response to biological outbreaks, large-scale hazardous chemical releases, and WMD threats, the need for planning at the agency level also increases. Consistent with National Incident Management System (NIMS) and National Response Framework (NRF) requirements, an all-hazards approach to emergency planning must be taken to ensure the agency’s ability to respond appropriately to all emergency events.

Further, Hurricanes Sandy, Irene, and similar extreme-weather-related events have led federal and state transportation agencies to place more focus on “rebuilding better” and on incorporating resilience into operations, maintenance, asset management, and design practices. The mitigation program area of emergency management is achieving greater prominence among the emergency management program areas, as mitigation is clearly tied to resilience. Planning for mitigation and resilience facilitates recovery, while implementing mitigation and resilience projects and practices prior to an event can lessen the impacts of a disaster.

There also is a distinction between a state transportation agency managing its specific responsibilities, as directed, in large-scale evacuations as part of the larger emergency management activity versus actually managing large-scale evacuations, which is not typically the agency’s role. Put another way, in relatively small incidents, the state transportation agency will play a proactive role in managing the incident, perhaps in a supporting role to law enforcement; however, in a major incident/evacuation/shelter-in-place/quarantine, while the agency’s role might be a major one, it is expressly a supporting role.

With these fundamental principles in mind, the discussion of emergency planning begins by reviewing the steps necessary to create an effective emergency planning process, realizing that emergency planning does not need to start from scratch. This is especially true in today’s environment—post-9/11, Hurricane Katrina, Superstorm Sandy, and more—in which most states have emergency planning processes in place.
This Guide also recognizes that there are numerous, acceptable planning processes that state transportation agencies can take that may not exactly match the processes discussed here. For example, NCHRP Report 740, A Transportation Guide for All-Hazards Evacuation, follows the six CPG 101 v.2 steps to help agencies develop transportation plans for all hazard emergency evacuation. By contrast, the emergency planning process provided in the Appendices as part of an overall Emergency Operations Plan template also employs six steps, but with different emphases in different order, as another process example (see Table 4). Common elements are collaboration, research, review, and the need to validate and perpetuate the planning and learning cycle— in brief, embracing the 14 principles of emergency management planning described in CPG 101 v.2 (2010). Regardless of the approach used, each planning process should address the 14 key CPG101 principles and meet the requirements of NIMS and the NRF.

### Table 4: Example DOT Emergency Planning Process

<table>
<thead>
<tr>
<th>Step</th>
<th>Activities/ focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Research</td>
<td>Research organization planning process, hazards, resource base, organization characteristics</td>
</tr>
<tr>
<td>2. Review</td>
<td>Review local, state, Federal laws, regulations, guidance; plans and agreements for /with jurisdiction, neighboring jurisdictions, sister agencies, tribal authorities, private sector organizations, military installations, etc.</td>
</tr>
<tr>
<td>3. Development</td>
<td>Rough draft of plan, functional annexes, hazard-specific appendices, agenda and invitation lists for first cycle of planning meetings</td>
</tr>
<tr>
<td>4. Brief the “CEO”</td>
<td>Convene presentation and planning meetings, develop and revise plan, obtain concurrence and approval, distribute plan</td>
</tr>
<tr>
<td>5. Validation</td>
<td>EOP review cycle, exercises</td>
</tr>
<tr>
<td>6. Maintenance</td>
<td>Establish remedial action process, revision process, organizational implementing documents e.g. SOPs</td>
</tr>
</tbody>
</table>

The following provides updated guidance to state transportation agencies pertaining to the most recent federal emergency planning policies and resources, including the all-hazards approach to emergency management required by NIMS and the NRF. Appendix A includes self-assessment checklists related to each step. Appendix F includes an example template for an EOP and its supporting annexes, consistent with Emergency Management Accreditation Program (EMAP) requirements. Being NIMS-compliant is important, as is developing workable emergency plans that meet all participants’ expectations.
Step 1—Form a Collaborative Planning Team

CPG 101 states, “Planners achieve unity of purpose through coordination and integration of plans across all levels of government, nongovernmental organizations, the private sector, and individuals and families.” Simply put, planning is a continuous and ongoing process that requires the active participation of, involvement of, and coordination with all levels of government. The reason for using a multi-organizational and multidisciplinary planning team is clear—a broad range of expertise is necessary to effectively implement the all-hazards approach of emergency management prescribed by NIMS and the NRF.

Given the number and complexity of the different hazards a community may face, it is exceptionally difficult for any one individual, or even an organization, to be fully versed in how to best prepare for, respond to, and recover from every hazard, particularly when the incident escalates. Forming a collaborative planning team enables all participants to gain a better understanding of the capabilities, needs, and response tactics of each organization involved in the response activities. Forming the team also addresses Principles 1 (planning must be community-based, representing the whole population and its needs) and 2, (planning must include participation from all stakeholders in the community) by enabling team participants to better understand how the decisions made by emergency managers and responders at all government levels may affect the ability of others to fulfill their response requirements. The four key phases in Step 1 are described below.5

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5 Recall that much of this information, including the supporting references, is summarized in tabular form in “Organizational, Staffing, and Position Guidance” in Section 6.
**PLAN Phase 01: Identify and Designate a Lead Emergency Planning Coordinator (EPC) and Staff to Oversee the State Transportation Agency Emergency Planning Process**

**Purpose.** Designate the best-qualified individuals and team to lead the state transportation agency’s emergency planning function.

**Actions.** Designate a lead Emergency Planning Coordinator (EPC) and staff to oversee the agency’s emergency planning process. Vest the EPC with adequate authority and resources to fulfill the goals and objectives of the agency’s emergency management program.

**Focus.** Develop a comprehensive EOP and coordinate state transportation agency emergency planning and management activities with the state’s NIMS coordinator. For the State EOP, the State Emergency Management Agency (SEMA) will likely have formed the team, with the transportation agency being a lead agency for ESF #1 (Transportation) and ESF #3 (Public Works) and supporting others. This team would typically include DHS and FEMA regional offices and personnel; state emergency management representatives; law enforcement personnel; public health officials; emergency fire, medical and rescue services personnel; and even some local EMAs.

For the state transportation agency’s EOP, the team will tend more toward regional and local levels, including agencies that would be part of traffic incident and emergency response in the absence of State EOC (SEOC) activation. There should be total consistency between the state’s and the transportation agency’s EOPs from the top-down perspective, but the agency’s EOP will have more details and probably a broader set of partners—more locally oriented—than the State EOP. Typical stakeholders are identified in Section 5.

**PLAN Phase 02: Engage the Whole Community in Planning**

**Purpose.** Ensure the state transportation agency EPC and core planning team are engaging the whole community in planning.

**Actions.** The Emergency Management Team develops an initial list of potential partners. (Tip: DOT Environmental Justice outreach and planning teams may provide useful contacts and starting points. TCRP Report 150, Communication with Vulnerable Populations: A Transportation and Emergency Management Toolkit, provides steps and tools to carry out and sustain such planning.) Figure9 from CPG 101 v. 2 identifies key elements in developing a community map and initiating such working relationships.
PLAN Phase 03: Issue Mission Statement for the Planning Team

Purpose. Clarify the purpose of the state transportation agency’s emergency planning function.

Actions. The state transportation agency Chief Executive Officer (CEO) should issue a mission and vision statement to demonstrate the agency’s commitment to emergency planning. The statement should define and/or identify the following:

- Scope of activities to be performed by the EPC and Planning Team,
- The agency’s high-level goals for the emergency planning process,

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6 References to the Chief Executive Officer are not intended to imply that he or she performs the work indicated—staff typically does that—but it is important that the CEO strongly endorse the work effort.
• Documents and/or programs to be developed by the agency’s emergency planning team. The statement should emphasize that the entire organization should be involved in creating these documents and programs, and
• The authority and structure of the planning group.

**Focus.** Develop a comprehensive EOP and coordinate state transportation agency emergency planning and management activities with the state’s NIMS coordinator.

*PLAN Phase 04: Establish Authority, Schedule and Budget of the Planning Team*

**Purpose.** Ensure the state transportation agency’s Emergency Planning Coordinator (EPC) and Planning Team have adequate authority, schedule and budget to perform the emergency planning function.

**Actions.** Demonstrate management’s commitment and promote an atmosphere of cooperation by authorizing the agency EPC and Planning Team to take the steps necessary to develop/update the agency’s emergency plans and response program. Support this action by participating in the State EOP process.

Establish a clear line of authority between team members and the state transportation agency EPC. Upper management should appoint participants to the planning team in writing. Participant job descriptions could also reflect this assignment. Roles and relationships with partners from the whole community- private sector, community based organizations, and more- should also be made explicit.

The Emergency Management Team defines specific goals and objectives of the emergency management process and performance metrics. Establish a work schedule and planning deadlines. Modify timelines as priorities become more clearly defined. Develop an initial budget for research, printing, seminars, consulting services, and other expenses that may be necessary during the development process.

**Focus.** Develop a comprehensive EOP and coordinate state transportation agency emergency planning and management activities with the state’s NIMS coordinator. Ensure the state transportation agency EPC and Planning Team have adequate resources and schedule to perform the emergency planning function.

**Step 1 Observations**

CPG 101 provides significantly more detail pertaining to the emergency planning process and the potential members who can be included on a collaborative planning team.

**Step 2—Understand the Situation**

**Conduct Research to Identify Hazards and Threats and Analyze Gathered Data**

Consistent with CPG 101 V.2 Principle 3 - Planning uses a logical and analytical problem-solving process to help address the complexity and uncertainty inherent in potential hazards and threats- it is clear that some degree of research and analysis must be performed at the state transportation agency level to (1) identify the hazards and threats that may exist or occur in the agency’s region and (2) determine the appropriate actions that can be taken to respond. Forming a collaborative team (per Step 1) is also essential to the research and analysis process for the same reason.
While emergency management planners may be able to draw from previous experiences and known facts, in many cases, assumptions will need to be made to analyze the risks, resources, needs, and capabilities required to respond to differing emergencies. Involving the planning team, including whole community participation, in the research and analysis process should help identify as many facts as possible and minimize assumptions.

**PLAN Phase 05: Identify Documents to be Developed, Reviewed, Approved, and/or Updated Regarding the State Transportation Agency’s Emergency Response Plans and Programs**

**Purpose.** Clarify the scope of the state transportation agency’s emergency planning process and the expected deliverables and outcomes.

**Actions.** Identify the documents to be developed, reviewed, approved, and/or updated regarding the agency’s emergency response plans and programs. This action would focus not only on the transportation-related elements of the State EOP, but also on any specific plans, guidance, overviews documents, standard operating procedures (SOPs), operating manuals, field operations guides (FOGs), handbooks, or job aids needed to support the capabilities of agency personnel to respond to emergencies.

**Focus.** The state transportation agency emergency planning process begins with the State EOP and the functional annexes and hazard-specific appendices. Specific plans, procedures, or other documents developed by the transportation agency and/or other agencies may support implementation of the State EOP, including the following:

- Overview and Primers—a brief concept summary of a function, team, or capability.
- Standard Operating Procedures (SOPs) or Operations Manuals—complete reference documents detailing the procedures for performing a single function (SOP) or a number of interdependent functions (Operations Manual).
- Field Operations Guide (FOGs) or Handbooks—durable pocket or desk guides, containing essential, basic information needed to perform specific assignments or functions.
- Job Aids—checklists or other aids useful in performing or training for a specific job to be performed in the EOP.
- Other plans may be available for state transportation review, including the state’s or agency’s
  - Continuity of Operations Plan (COOP);
  - Continuity of Government Plan (COG);
  - Critical Infrastructure/Key Resources (CI/KR) Protection Plans; and
  - Pandemic Flu Plan.
- Transportation-specific plans may include:
  - Transportation/Traffic Incident Management Plans; and
  - Emergency Response Plans and Hazard-Specific Response Plans (e.g., snow/ice, hurricane, and responses like contraflow operations).

**PLAN Phase 06: Work with State NIMS Coordinator to Identify State Transportation Agency Requirements for Addressing Statewide Implementation of the National Incident Management System**

**Purpose.** Ensure compliance and coordination with statewide initiatives to meet NIMS requirements.
**Actions.** Work with the State NIMS Coordinator to identify state transportation agency requirements for addressing statewide NIMS implementation. If necessary, provide NIMS training for the agency Emergency Planning Coordinator and team.

**Focus.** Develop relationships and capacity to determine and develop compliance actions to ensure state transportation agency actions comply with NIMS. The agency planning team should meet with the State NIMS Coordinator to establish a working relationship for addressing NIMS compliance issues and to determine if the agency should have a NIMS coordinator. If so, and if one is not already assigned, determine whether the agency Emergency Planning Coordinator should assume this role. This role may include the following:

- Receive and review a copy of the State’s NIMS Implementation Plan.
- Obtain from the State NIMS Coordinator a clear list of NIMS requirements being addressed by the state and any outstanding corrective action plans (CAPs) filed with FEMA that may relate to the transportation agency.

**PLAN Phase 07: Review State EOP and Supporting Annexes and Appendices and Other Documents for Transportation-Related Activities**

**Purpose.** Determine how the State EOP and supporting annexes, appendices, and other documents address transportation issues, requirements, and needs.

**Actions.** Work with the State NIMS Coordinator to obtain a copy of State EOP and supporting annexes, appendices, and other documents. Ensure that state transportation agency plans and procedures are consistent with the State EOP.

**Focus.** Traditionally, State EOPs have not recognized the full capabilities of transportation agencies, particularly in the intelligent transportation systems (ITS) arena. Based on the information gathered from the State EOP, the transportation agency may find it necessary to update or modify its contributions to the State EOP (usually ESFs #1 and #3 from the National Response Framework- some states and regions may use different nomenclature) and perhaps revise the emergency management and response procedures and protocols in the agency EOP to better mesh with those prescribed by the State EOP.

**PLAN Phase 08: Review Relevant Hazards Likely to Result in an Emergency Requiring Activation of State Emergency Operations Center**

**Purpose.** Identify and analyze the potential hazards and threats in the state transportation agency’s region to evaluate the full progression of how they will occur and be resolved by the region.

**Actions.** Beginning with an identified hazard, evaluate its impacts in terms of probability and severity. This action can be accomplished using CAPTA/CAPTool available as part of NCHRP Report 525: Surface Transportation Security, Volume 15: Costing Asset Protection: An All Hazards Guide for Transportation Agencies (CAPTA). Determine realistic response activities and the consequences of not being able to complete these activities.

**Focus.** The culmination of this process is development of hazard scenarios that form the foundation for writing or updating the state transportation agency’s emergency preparedness plan and/or protocols. Analyzing the levels of probability and severity of each identified hazard helps agency emergency planners prioritize the actions necessary to prepare for such events and helps determine and communicate acceptable levels of risk.
**PLAN Phase 09: Gather Information Regarding Vulnerable Populations**

**Purpose.** Identify the special dynamics of affected areas including knowing the best evacuation routes, shelter-in-place/quarantine locations, points of entry and exit, the demographics of seniors and vulnerable populations, and the special equipment and services necessary to evacuate, shelter-in-place, or quarantine these citizens safely.

**Actions.** Work with whole community partners brought in as part of Plan Phase 02 to gather additional information and partners. Work with the State NIMS Coordinator, partner transportation agencies, broad-based as well as narrowly focused social service and community-based organizations, and other whole community stakeholders to identify transportation-disadvantaged and vulnerable populations. Working with the community, develop plans and procedures, and assemble resources needed to safely evacuate, shelter-in-place, or quarantine these populations. When developing the mitigation portions of the plan, use the demographic information and contacts to ensure that mitigation and resilience planning and implementation is inclusive of the whole community.

**Focus.** Improve emergency response capabilities and processes for evacuating transportation-disadvantaged and vulnerable populations.

**PLAN Phase 10: Determine Status of State Transportation Agency Emergency Planning Activities and Data to Identify Areas Needing Improvement**

**Purpose:** Assess what still needs to be done.

**Actions.** Verify that the agency has completed procedures regarding how to work with the state to request federal assistance.

**Focus.** Improve emergency response capabilities and processes.

**PLAN Phase 11: Define Response Issues, Roles, and Tasks by Reviewing Universal Task List, Target Capabilities List, Resource Typing List, and National Planning Scenarios**

**Purpose.** Ensure coordination with DHS and FEMA guidance.

**Actions.** Work with the State NIMS Coordinator and partner transportation agencies. Develop plans and procedures, and assemble resources needed to respond safely to emergency events.

**Focus.** Improve emergency response capabilities and processes.

**PLAN Phase 12: Based on Activities Identified in State EOP and Supporting Annexes and Appendices, Develop/Update State Transportation Agency’s Transportation Incident Management Organization to Ensure All Activities Conform to National Incident Management System and National Response Framework Requirements**

**Purpose.** Ensure that an incident management organization, compliant with NIMS, has been established to integrate state transportation personnel into the Incident Command System (ICS) to be used during emergencies requiring activation of the State EOC.

**Actions.** Update organization charts and determine whether specific teams, groups, committees, and/or temporary organizations will be used to manage state transportation agency responses to emergencies identified in the State EOP. Review agency Traffic Incident Management (TIM) Plans and Protocols and
specific emergency response plans to identify incident management structures currently used. Identify and train agency field personnel in charge of on-scene response in procedures to coordinate with the ICS established by the local or state emergency response agencies on scene.

**Focus.** Improve emergency response capabilities and processes.

**Step 3—Determine Goals and Objectives**

CPG 101 defines goals as “... broad, general statements that indicate the intended solution to problems identified by planners during the previous step” [referring here to Understanding the Situation-Identifying Threats and Hazards and Assessing Risk]. CPG 101 also defines objectives as being “... more specific and identifiable actions carried out during the operation...Translating these objectives into activities, implementing procedures, or operating procedures by responsible organizations is part of planning. As goals and objectives are set, planners may identify more requirements that will feed into the development of courses of action as well as the capability estimate (see Step 4)” (CPG 101, v. 2, 2010).

Defining the goals and objectives of emergency planning and response activities involve two phases (phase 13 and 14) as described below.

**PLAN Phase 13: Establish State Transportation Agency Operational Priorities in Response to Hazards Identified in Existing State EOP and Supporting Documents, as well as New Challenges Identified during Analysis Process**

**Purpose.** Clarify what the state transportation agency must accomplish to achieve a desired end state for the operation.

**Actions.** Build incident scenarios based on realistic hazard/threats and risk data. Each scenario should include:

- Prevention/protection
- Initial warning – develop and analyze the likely course of action- e.g., evacuation, shelter in place, both, depending on incident and location
- Impact/specific consequences
- Response requirements. Requirements can be generated by the hazard or threat, by the response, and by constraints/restraints.
- Once the requirements are identified and confirmed, response requirements should be restated as priorities
Focus. Identify the requirements that determine actions and resources.

**PLAN Phase 14: Establish State Transportation Agency Response Goals and Intermediate Objectives in Response to Hazards Identified in Existing State EOP and Supporting Documents, as well as New Challenges Identified during Analysis Process**

**Purpose.** Clarify what constitutes success regarding the state transportation agency’s response to the range of emergencies that could occur resulting from the hazards identified for the state.

**Actions.** Develop state transportation agency goals and objectives that build on the emergency response needs and demands of the agency and its partners, as determined through hazard analysis and risk assessment activities described above.

**Focus.** Ensure that goals and objectives support accomplishing the plan mission and operational priorities, and that they indicate the desired result or end state.

**Step 4—Plan Development**

Develop and Analyze Courses of Action and Identify Resources

Once possible hazards and threats have been identified, the state transportation agency’s planning team should develop the plan. The team will need to analyze the courses of action necessary to respond to each hazard and/or threat. While the hazard and threat identification process may largely entail scenario-based planning, developing the courses of action to take in response to hazards and threats often requires functional and capabilities-based planning. The objective of these planning processes is to force the planning team to imagine how response activities will unfold through the course of the response, beginning with the onset of the emergency and ending with a full return to normal operations. This includes identifying the actions that will be taken by the state transportation agency and all other response agencies, the resources necessary to ensure the safety and success of response efforts, and the information and intelligence needs required for success. This process includes Phases 15, 16 and 17, which follow.

**Example: Relationships among the Mission, Operational Priorities, Goals, and Objectives**

**Plan Mission:** Effectively coordinate and direct available resources to protect the public and property from hazards or threats.

**Operational Priority:** Protect the public from hurricane weather and storm surge.

**Goal:** Complete evacuation before arrival of tropical storm winds.

**Objective:** Complete tourist evacuation 72 hours before arrival of tropical storm winds. Described result: All self- and assisted evacuees are safely outside of the expected impact area prior to impact.

**Example from CPG 101, v.2**

**NCHRP Report 740 A Transportation Guide for All-Hazards Evacuation** employs the CPG 101 steps for evacuation planning. Step 4 in the Guide includes flowcharts to assist in developing timelines and tools to support resource typing, database development, checklists for interagency communications and coordination, and more. Though geared to evacuation planning, the Guide also includes tips for using special event planning to assist in emergency planning.
Supporting Planning Concepts

Scenario-based Planning. This approach starts with building a scenario for a hazard or threat. Then, planners analyze the impact of the scenario to determine appropriate courses of action. Planners typically use this planning concept to develop planning assumptions, primarily for hazard- or threat-specific annexes to a basic plan.

Function-based planning (functional planning). This approach identifies the common functions that a jurisdiction must perform during emergencies. Function-based planning defines the function to be performed and some combination of government agencies and departments responsible for its performance as a course of action.

Capabilities-based Planning. This approach focuses on a jurisdiction’s capacity to take a course of action. Capabilities-based planning answers the question, “Do I have the right mix of training, organizations, plans, people, leadership and management, equipment, and facilities to perform a required emergency function?” Some planners view this approach as a combination of scenario- and function-based planning because of its “scenario-to-task-to-capability” focus.

In reality, planners commonly use a combination of the three previous approaches to operational planning— the hybrid approach. Using the hybrid approach converts requirements generated by a scenario into goals and objectives that drive the planning process. It leads to a basic plan that describes overarching roles, relationships, and responsibilities with functional, hazard, and threat annexes that reflect sequencing of actions. A hybrid planning approach helps identify the courses of action that a jurisdiction must be able to take and the required functions it must perform based upon a comprehensive risk analysis; thus, it helps identify the capabilities a jurisdiction must have. FEMA strongly advocates the hybrid approach.

CPG 101, v. 2 (2010)

PLAN Phase 15: Use Scenario-Based, Functional, and Capabilities-Based Planning to Depict how the State Transportation Agency’s Response to a Range of Emergency Situations May Unfold

Purpose. Employ an all-hazards approach to emergency management.

Actions. Use a formal process for building relationships among the occurrence of hazards, decision points, and response actions, including the following:

- Establish a timeline for the event and response actions, depending on the type of hazard or threat to be addressed.
- Depict the scenario developed in Step 3, and place the incident information on the timeline. Keep in mind the goals and objectives discussed above that are to be fulfilled during response activities.
- Identify and depict operational tasks. For each operational task, planners should be able to answer the following questions:
  - What is the action?
  - Who is responsible for the action?
  - When should the action take place?
  - How long should the action take and how much time is actually available?
  - What has to happen before?
  - What happens after?
  - What resources does the person/ entity need to perform the action? (Questions from CPG 101. V. 2, 2010).
- Select courses of action. Assess progress made toward the end state; identify whether goals and objectives are being met and if any new needs or demands develop; identify tasks that, if not completed, would cause the response to fail; and check for omissions and gaps, inconsistencies in organizational relationships, and mismatches between the plans of the state transportation agency and other response parties and jurisdictions.
Focus. Identify and analyze hazards and risks faced by the state transportation agency and develop response plans and procedures that can be used to safely mitigate and control these hazards and risks.

**PLAN Phase 16: Identify Resources Needed to Support State Transportation Agency’s Emergency Response Activities**

**Purpose.** Ensure adequate resources are available for emergency response efforts.

**Actions.** Use a formal process to identify resource shortfalls including all facilities vital to emergency operations and how they may be affected by individual hazards or threats, and develop a list of alternative resources that may be obtained from neighboring states or jurisdictions, or private suppliers. Identify additional information needs to help drive decision-making and response actions.

The Emergency Management Assistance Compact (EMAC), administered by the National Emergency Management Association (NEMA), is a congressionally ratified organization that provides form and structure to interstate mutual aid (FEMA-EMAC, 2007). The EMAC should be a significant part of the State EOP, including the preparation, response, and recovery processes. Likewise, the EMAC should play a significant role in the state transportation agency’s EOC structure and operations, especially if the state is authorized to use EMAC locally. Through EMAC, a disaster-impacted state can request and receive assistance from other member states quickly and efficiently, with liability and reimbursement terms and conditions already addressed and accepted at the state level. It is important in this regard that all involved in emergency management use NIMS resource typing to ensure consistency with standard resource definitions to receive timely responses to fulfill the request from other states or FEMA.

Focus. Identify and analyze all possible hazards and risks faced by the state transportation agency and develop response plans and procedures that can be used to safely mitigate and control these hazards and risks.

**PLAN Phase 17: Identify Information and Intelligence Needs to Support State Transportation Agency’s Emergency Response Activities**

**Purpose.** Ensure that information and intelligence requirements and resources are identified along with their deadlines for receiving it to drive decisions and trigger critical actions.

**Actions.** The two major and equally important facets of identifying information and intelligence needs are:

- Interagency, interdisciplinary, and interjurisdictional communication and information exchanges (internal communication), and
- Accurate and timely communication with the public and with community partners in the communication network (if active) (public communications).

In the planning stages of internal communication:

- Clarify what information will be exchanged with counterparts within functional area in other jurisdictions;
- Determine which communications are necessary within each jurisdiction across other functional areas; and

• Work out the logistics of how to communicate. Practice sharing information between Emergency Operations Centers (EOCs) and Traffic Management Centers (TMCs) and, if appropriate, with Fusion Centers (DHS funded). In the planning stages of public communication:
  o Decide how to communicate with the public in a clear, consistent manner.
  o Work very closely with ESF #15, External Affairs.
  o Include in pre-scripted messaging and public education efforts
    - The meaning of terms,
    - Evacuation routes,
    - What to take and what to leave behind,
    - Information on transporting pets,
    - Where to meet for pick-ups if transportation is needed,
    - Advantages of a “buddy system,” and
    - How to obtain transportation assistance if needed.
  o Keep messages consistent as possible across the jurisdictions in the planning area.
  o Include community partners with strong ties to the whole community, in particular to groups and individuals with access and functional needs. (Refer to TCRP Report 150 on how to establish and engage a community network.)
  o Use multiple media, communications methods, and languages that are accessible to the deaf and hard of hearing, to those who are blind or of low vision, to those who do not speak English, and to those who may have cognitive disorders.
  o Employ social media, such as Facebook and Twitter, to reach the broadest possible audience.
  o Keep messages simple, clear, and accurate.

The Checklist for Inter-Agency Communications and Information Sharing (from NCHRP Report 740 found in Appendix A) provides worksheets to plan and track communication within transportation, across jurisdictions and multiple stakeholders, and public communication through multiple stages of an event. It is intended for use in planning, and could be one of the tools used in an Intelligence and Information Exchange Workshop (among many workshops recommended in Report 740).

Focus. Identify, plan and practice communications and information exchanges on multiple dimensions.

Step 5—Plan Preparation, Review and Approval
Each of the above activities sets the groundwork for writing or updating the state and/or state transportation agency Emergency Operations Plan(s); however, when discussing how best to write an EOP, agencies must consider two fundamentals of emergency planning. First, planning assigns tasks, allocates resources, and establishes accountability. This means that an effective EOP must clearly define the organizational roles and responsibilities of transportation agency personnel, as well as those of other emergency response agencies. Second, effective EOPs not only tell those within the planning community what to do (the tasks) and why to do them (the purposes), effective EOPs also inform those outside the jurisdiction about how to cooperate and provide support and what to expect. The best way to incorporate this principle in the plan development, review, and revision process is to use the state transportation agency’s emergency planning team, supported by members of the whole community. The plan must then be formally approved. The fundamental principles of emergency planning dictate that the planning process includes senior officials throughout the process to ensure both understanding and buy-in. This is achieved most successfully when senior leadership has been involved from the onset of the state
transportation agency’s planning activities. Completion of the following three key phases (phases 18, 19 and 20) will fulfill this step.

**PLAN Phase 18: Write the Plan**

Develop and/or Update Transportation-Related Components of State EOP, Functional Annexes, and Hazard-Specific Appendices; Develop and/or Update Supporting Materials; Include any Specific Plans, Guidance, Overviews, Documents, SOPs, Operating Manuals, FOGs, Handbooks, and Job Aids Needed to Support Capabilities of State Transportation Agency Personnel to Respond to Emergencies.

**Purpose.** Complete state transportation planning inputs and deliverables for the State EOP and supporting documents, and ensure that sufficient reference materials exist to support the training and response activities of state transportation personnel during emergencies.

**Actions.**

- Establish expectations regarding transportation functions during the range of potential incidents addressed in the State EOP.
- Develop/update transportation-related components of the State SOP, the functional annexes to the State EOP, and the hazard-specific appendices to the State EOP.
- Ensure that state transportation agency liaisons are available to support the State EOC and, if applicable, the county/municipal EOCs, TMC(s) and/or FC(s), during a state-declared emergency.
- Identify needed state transportation agency plans or documents to be developed, including any agency-specific emergency response plans, COOP/COG plans, etc. Supporting actions may include developing the following:
  - SOPs detailing the procedures for performing individual functions identified in the transportation-related component of the State EOP and hazard-specific annexes.
  - If applicable, an Operations Manual detailing the performance of a number of interdependent functions specified in the transportation-related elements of the State EOP.
  - A FOG or Handbook, such as a durable pocket or desk guide, containing essential, basic information needed to perform specific assignments or functions as specified in the transportation-related elements of the State EOP.
  - Job Aids to provide detailed checklists or other aids for job performance or job training regarding the transportation-related elements specifics in the State EOP and Hazard-Specific Annexes.
  - Criteria for the reporting, and (particularly) verifying potential incidents by motorists or to the citizens, even from specially trained individuals, such as road watch, volunteer spotter, and other probe programs (including transit vehicle operators).

**Focus.** Identify and analyze all possible hazards and risks faced by the state transportation agency and develop response plans and procedures that can be used to safely mitigate and control these hazards and risks.

**PLAN Phase 19: Review the Plan**

**Purpose.** Check the written plan for its conformity to regulatory requirements and the standards of Federal or state agencies, as appropriate, and for its usefulness in practice.
Actions:

- Review the emergency response / emergency management plan from a performance perspective:
  - When was the plan last updated?
  - Does the plan define and accommodate transitions from minor incidents to major incidents?
  - What major incidents have occurred since the plan was last updated?
  - Was the plan used for those incidents?
  - How well did the plan work with regards to those major incidents?
  - Were there After Action Reports with recommendations for improvement for any or all of those incidents?
  - Were those improvements implemented?

- Review the emergency response/ emergency management plan from a legislative and multi-organization perspective.
  - Does it adequately correspond to the most recent State Emergency Management Plan?
  - Does it reflect the latest federal and state regulations and guidance?
  - Does it reflect updated local, regional, sister agency and neighboring jurisdiction emergency plans and agreements, including mitigation and resilience plans and projects?
  - Does it reflect updated agreements with military installations, tribal authorities, private sector organizations, and other entities representing the whole community perspective?

- From the review, identify what improvements are needed to bring the response plan up to date, based on your state experiences and perspectives.
  - Does the plan adequately address the “five Ps”: Plans, Policies, Practices, Procedures and Personnel?
  - Does the plan adequately address changes in threats and hazards?
  - Does the plan adequately address changes in agency resources, including infrastructure, equipment and personnel?
  - Does the plan adequately address changes in the broader geographic and institutional context?
  - What is needed to transform or help the response plan evolve into an overall emergency plan?
  - Look for major missing elements that are included in this guide, from the full emergency planning cycle, in particular mitigation.
  - Look for other potential gaps in the plan. Templates adapted from Tennessee DOT frameworks (Appendix F) and the Self-Assessment Checklist (Appendix A) may help.

Focus. Review and evaluate the EOP to determine its adequacy, feasibility, acceptability, completeness, and compliance with applicable guidance or regulatory requirements. The CPG 101 v.2 definitions for these measures are included below.
Adequacy: A plan can be considered adequate if the

- Scope and concept of planned response operations identify and address critical tasks effectively;
- Assigned mission can be accomplished while complying with guidance; and
- Assumptions are valid, reasonable, and comply with guidance.

Feasibility: A plan can be considered feasible if the

- Organization can accomplish the assigned mission and critical tasks by using available resources within the time contemplated by the plan; and
- Available resources, including internal assets as well as those that can be gained through mutual-aid or existing state, regional, or federal assistance agreements, are allocated to tasks and tracked by status (assigned, out of service, etc.)

Acceptability: A plan can be considered acceptable if it

- Meets the needs and demands driven by the threat or event, meets decision maker and public cost and time limitations, and is consistent with the law; and
- Can be justified in terms of the cost of resources and if its scale is proportional to mission requirements.
- In addition, verify that risk management procedures have identified, assessed, and applied control measures to mitigate operational risk.

Completeness: A plan can be considered complete if it

- Incorporates all tasks to be accomplished;
- Includes all required capabilities;
- Provides a complete picture of the sequence and scope of the planned response operation (i.e., what should happen, when, and at whose direction);
- Includes time estimates for achieving objectives; and
- Identifies success criteria and a desired end-state.
- Integrates the needs of the general population, children of all ages, individuals with disabilities and others with access and functional needs, immigrants, individuals with limited English proficiency, and diverse racial and ethnic populations- See Appendix A for checklists.

Compliance with Guidance and Doctrine: A plan can be considered compliant with guidance and doctrine if it complies with all applicable guidance and regulatory requirements to the maximum extent possible.

- Include nongovernmental organizations and the private sector in an all-hazards exercise program, when appropriate.
**PLAN Phase 20: Formally Approve and Implement Transportation-Related Provisions of the State and State Transportation Agency’s EOPs and Supporting Annexes and Agency-Specific Supporting Materials**

**Purpose.** Ensure adoption of the EOPs and supporting materials.

Actions. Ensure review by those at the state emergency management level to verify that State EOP transportation-related provisions have been appropriately adopted by the state transportation agency and addressed by its EOP or supporting materials. Approve both plans through a formal promulgation documentation process that establishes the authority required for making changes and revisions to the plans. Ensure the plans are signed by the agency’s chief executive and his or her executive management team, particularly by regional/district leadership in decentralized agencies.

**Focus.** Identify where to improve the plans for clarity and usefulness.

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**Step 6—Plan Implementation and Maintenance**

The discussion of emergency planning concludes by further noting the importance of the plan implementation, review, revision, and overall maintenance process. Because plans guide the preparedness process, it is important that they are routinely tested through training, drills, and exercises. This is necessary not only to verify the accuracy of the EOP and its supporting procedures and to identify and address any potential gaps, but also to increase the state transportation agency’s overall state of readiness, as well as that of its personnel and partners. Because emergency planning is a continuous process, and the participants involved in planning and preparing for, responding to, and recovering from emergencies often change from year to year, it is imperative that the state transportation agencies establish mechanisms for ongoing review and revision of their EOPs—both the State EOP and the agency internal one(s). Exercising, reviewing, revising, and maintaining the EOPs require two phases (phase 21 and 22), as described below.

**PLAN Phase 21: Exercise the Plan and Evaluate its Effectiveness**

**Purpose.** Ensure that state transportation response providers, supervisors, and command-level personnel are prepared for their emergency management roles through training, drills and exercises. Training should provide personnel with the knowledge, skills, and abilities to perform required tasks in emergency plans and in organization-specific procedures. Drills and exercises along with actual incidents and field experience provide personnel with the opportunity to practice what they have learned, demonstrate their capabilities, and develop discipline-specific skills. Results of exercises and real-world incidents also determine the effectiveness of plan components and areas of improvement that need to be addressed.

- Distribute the plan to all necessary parties, including all members of the state transportation agency’s emergency planning team and any outside agencies or jurisdictions that may be involved in emergency response efforts within the agency’s region or that could be expected to call upon the agency to support response efforts in their regions.
- The agency’s EPC should keep a record of all of the individuals and agencies to whom the plan was provided.

It is recommended that the state transportation agency make a version of the Emergency Operations Plan publicly accessible. Such transparency is good for accountability, for sharing with seldom-used response partners, and for securing necessary resources to carry out assigned responsibilities. Further, sunshine
laws may require that a copy of the EOP be posted on the agency’s website or placed in some other publicly accessible location.

Sensitive information should be in annexes that, while referenced in the public version, are not available to the public.

Further information on Training and Exercises is contained in Section 6. Also, see Appendix A4 for a high-level Checklist on Strategies to Exercise the Regional Transportation Plan.

**PLAN Phase 22: Establish Ongoing Review and Assessment Process for Transportation-Related Elements of State and State Transportation Agency EOPs and Supporting Materials**

**Purpose.** Ensure that the state and state transportation agency EOPs, procedures, and supporting materials are up to date.

**Actions.** Establish minimum timeframes for review as well as the specific events (i.e., update of the State EOP, change of personnel, provision of new or additional resources, issuance of new regulatory requirements, change in regional demographics or hazard profile) that should prompt a review and possible revision of the EOP(s).

**Focus.** Maintain accurate, relevant, and immediately useful plans and procedures.

**Prepare for the Emergency**

The discussion of emergency preparedness and its role in the state transportation agency emergency management process must begin by revisiting Homeland Security Presidential Directive 8, National Preparedness (HSPD-8).

HSPD-8 established “policies to strengthen the preparedness of the United States to prevent and respond to threatened or actual domestic terrorist attacks, major disasters, and other emergencies by requiring a national domestic all-hazards preparedness goal, establishing mechanisms for improved delivery of Federal preparedness assistance to State and local governments, and outlining actions to strengthen preparedness capabilities of Federal, State, and local entities”.

Preparedness involves planning, resources, training, exercising, and organizing to enhance operational capabilities. Preparedness is the “process of identifying the personnel, training, and equipment needed for a wide range of potential incidents, and developing jurisdiction specific plans for delivering capabilities when needed for an incident.” (2010 CPG 101 v. 2)

HSPD-8, National Preparedness has been replaced by Presidential Policy Directive 8 (PPD-8) on National Preparedness. Released in March 2011, PPD-8 seeks to strengthen national security and resilience through “systematic preparation for the threats that pose the greatest risk to the security of the Nation, including acts of terrorism, cyber-attacks, pandemics, and catastrophic natural disasters.” PPD-8 mandated the creation of policy and planning documents including the National Preparedness Goal and the National Preparedness System (PPD-8 2011). Released in February 2013, Presidential Policy Directive 21 (PPD-21)

**National Preparedness Goal Vision**

To engage Federal, State, [territorial,] local, and tribal entities, their private and nongovernmental partners, and the general public to achieve and sustain risk-based target levels of capability to prevent, protect against, respond to, and recover from major events in order to minimize the impact on lives, property, and the economy.
on Critical Infrastructure Security and Resilience is aligned with PPD-8 and replaced HSPD-7. PPD-21 directed the Executive Branch to develop situational awareness capability to address physical and cyber functioning of infrastructure in near real-time, understand the cascading consequences of infrastructure failures, update the NIPP, focus on public-private partnership, and establish a research and development plan. Because PPD-21 also elevated the role of the U.S. Department of Transportation to co-sector-specific agency along with the Department of Homeland Security, the continued expansion of the role of state transportation agencies in managing emergencies is expected. (NCHRP Synthesis 468)

The original National Preparedness Goal (NPG), released in 2011, identified core capabilities for each of the five mission areas with mitigation being a new, fifth mission area added to the NPG. The new 2015 National Preparedness Goal describes Preparedness as a “shared responsibility” by the whole community to achieve the goal of a “secure and resilient Nation.” It retains the five mission areas in the original 2011 NPG. Core capabilities, identified and updated through the Strategic National Risk Assessment, are used to execute each of five mission areas: Prevention, Protection, Mitigation, Response, and Recovery. Because these core capabilities are interdependent and shared by many entities, and agencies have limited resources, effective interagency and interjurisdictional coordination is essential in improving preparedness.

The top NPG priorities are to implement the NIMS and the NRF, expand regional collaboration, and implement a National Infrastructure Protection Plan (NIPP). It is also the priority of the NPG to strengthen

- Information sharing and collaboration capabilities;
- Interoperable communications capabilities;
- Chemical, biological, radiation, nuclear, and explosive weapons (CBRNE) detection, response, and decontamination capabilities; and
- Medical surge and mass prophylaxis (i.e., disease prevention) capabilities.

While strengthening medical surge and mass prophylaxis capabilities may appear to be beyond the scope of state transportation agencies, it is important to note that each of the other NPG priorities are directly applicable and imperative to improving transportation agency emergency preparedness capabilities. The previous discussion of emergency planning noted the importance of developing an EOP that is both workable and that meets all partners’ expectations. This is best accomplished through information sharing and collaboration among a broad range of stakeholders and emergency management experts (i.e., the state transportation agency’s emergency planning team). While the planning phase is designed to bring stakeholders together to create a collaborative planning team and an effective EOP, the preparedness phase of emergency management works to ensure the EOP can meet its objectives. As to medical surge and mass prophylaxis, it is not unusual for state transportation agencies to be involved in transportation and distribution plans for national stockpiles and personnel to administer them.

During the preparedness phase, the EOP guides and directs the development of supporting hazard- and threat-specific plans and procedures and serves to remind the state transportation agency planning team of the ultimate goals and objectives of the agency’s emergency response activities. In this manner, the EOP continues to evolve, intrinsically linking planning and preparedness together through its implementation.
HSPD-8 defines national preparedness as “the existence of plans, procedures, policies, training, and equipment necessary at the Federal, State, [territorial,] and local level to maximize the ability to prevent, respond to, and recover from major events.” At the state transportation agency level, preparedness is more simply described as the tasks and activities necessary to build, sustain, and improve the agency’s operational capability to prevent, protect against, respond to, and recover from the hazards and threats that it may face. Based on this description, it is clear that emergency preparedness cannot end with the development and implementation of the state or transportation agency EOP, rather, it must instead include development, implementation, and testing of other support plans and procedures that define the specific tasks to be completed during emergency response activities.

The three fundamental questions in the Preparedness phase of emergency management are still the same:

1. How prepared do we need to be?
2. How prepared are we?
3. How do we prioritize efforts to close the gap?

Answering these questions requires the state transportation agency to take an all-hazards approach to identifying the hazards and threats it may face and to develop tangible actions that can be taken to respond to these hazards and threats—the NIMS and the NRF approach to emergency management. It is also important to note that answering these questions requires the agency to evaluate and manage risks. Because no entity has sufficient resources to protect against every threat and every hazard, state transportation agency investment in preparedness activities is necessarily risk-based.

This inherently involves development and application of standards and measures to assess the current capabilities, performance, and overall preparedness of the agency. Since HSPD-8 was first issued on December 17, 2003, states have worked to develop and implement required standards and metrics and have developed strategies consistent with the NPG to plan and prepare for, respond to, and recover from emergency events. In doing so, many states have established specific preparedness measures that state transportation agencies must meet (typically identified in the State EOP). The following has been developed to provide state transportation agencies with the tools necessary to evaluate the effectiveness of their own emergency preparedness processes against the standards and metrics required by NIMS and to provide additional detail on how best to implement the agency EOP.

**Step 1—Develop Approaches to Implement State Transportation Agency Roles and Responsibilities During Emergencies**

In order for state transportation agencies to implement their roles and responsibilities during emergency events, they must first know what their roles and responsibilities are. The research and data analysis phase of emergency planning recommended that agencies start the research process by reviewing the State EOP and its supporting annexes/appendices. This is necessary to identify any transportation-related activities, issues, requirements, and/or needs that the agency may be designated to complete or fulfill. Similarly, the state transportation agency should also review the EOPs and emergency transportation plans of local and regional transportation organizations and agencies to determine if the agency is being relied upon to provide support and resources at the local and regional level. Developing approaches to implement its roles and responsibilities during emergencies requires the agency to complete four phases. As in the PLAN phase, self-assessment checklists for state transportation agencies are included in Appendix A.
**PREPARE Phase 01: Establish Protocols for Addressing National Terrorism Advisory System (NTAS) Bulletins and Alerts**

**Purpose.** Address DHS/TSA and FHWA/FTA recommendations for responding to National Terrorism Advisory System (NTAS) Bulletins and Alerts.

**Actions.** DHS issues NTAS Bulletins and Alerts. Bulletins provide broad and general information about terrorism trends, events, and threats but do not reach the level of credibility or specificity needed to issue an Alert. Alerts can be either Elevated for credible but general threat information or Imminent for credible, specific, and impending threats in the very near term. Agencies should implement necessary precautions and protective measures as appropriate for each Bulletin and Alert. Where possible, coordinate the activities with the transportation-related activities in the state’s basic EOP and the Hazard-specific Annexes.

**Focus.** Increase the readiness of state transportation agencies and improve their ability to respond appropriately to changing threat levels and conditions.

**PREPARE Phase 02: Develop Memorandum of Understanding/Agreement (MOU/A) with other Local and State Agencies Regarding Transportation-Related Elements Specified in State and Regional EOPs**

**Purpose.** Ensure that formal plans and procedures are in place for mutual aid, as specified by FEMA in the NRF and NIMS and in the State EOP.

**Actions.** Promote intrastate and interagency mutual-aid agreements (to include agreements with the private sector and nongovernmental organizations [NGOs]). Develop MOU/As and notification/information-sharing protocols with local/regional and state partners regarding the transportation-related elements specified in the State EOP. Supporting actions may include the following:

- Use the state/territory response asset inventory for intra- and interstate mutual-aid (such as EMAC) requests, exercises, and actual events.
- Build relationships with local, regional, state, and federal Emergency Management Agencies (EMAs), Emergency Operation Centers (EOCs), Emergency Planning Committees, Emergency Response Commissions, TMCs, Fusion Centers (FCs), and Public Health and Agricultural organizations. In addition, consider including regional entities and other countries in MOU/As. Figure 10 illustrates the overlapping interests of the TMC (called Operations Center in the figure), EOC, and the FC. Appendix A contains additional information regarding FCs.
- Define key terms, roles, and responsibilities of individuals, and contact information. Include procedures for requesting and providing assistance.
- Include procedures, authorities, training requirements and rules for payment, reimbursement, and allocation of costs.
- Include notification procedures and protocols for interoperable communications. Explain relationships with other agreements among jurisdictions.
- Address workers’ compensation and treatment of liability and immunity.
- Provide for recognition of qualifications and certifications.
• Share agreements, as required. Review, support, and adopt FEMA’s ongoing efforts to develop a national credentialing system.
• Expand mutual-aid agreements beyond support services and equipment to include information sharing and interagency decision making.
• Establish MOUs with the owners of telecommunications, electrical power transmission trunk lines, pipelines, viaducts, etc., for monitoring these facilities, and include in the EOP appropriate responses to damage to them.

Focus. DHS recommends that basic MOU/As include protocols for requesting assistance, chain of command and control, compatibility of resources, and what level of assistance is to be expected. MOU/As developed by state transportation agencies should therefore define the transportation-related elements, activities, roles, responsibilities, and resources that the agency will supply during emergency response activities, as well as those the agency will receive from other response agencies and organizations. MOU/As should also incorporate the NIMS requirements, especially when the transportation agency enters into an agreement with private-sector companies or volunteer organizations that are not mandated to meet the NIMS requirements. Other information an agency may include in an MOU/A includes the following:

• Definitions of key terms used in the agreement;
• Definitions of participating agency jurisdictional boundaries;
• Procedures for requesting and providing assistance;
• Procedures, authorities, and rules for payment, reimbursement, and allocation of costs;
• Notification procedures;
• Protocols for interoperable communications;
• Relationships with other agreements among jurisdictions;
• Treatment of liability, immunity, and workers’ compensation;
• Recognition of qualifications and certifications;
• Future evaluation and modification of procedures and protocols;
• Training and joint exercise responsibilities; and
• Sharing agreements.

See Appendix A for a Checklist of Transportation Resources and a Checklist of Emergency Events Affecting Multiple Jurisdictions, Transportation, and Interdependencies.

PREPARE Phase 03: Develop Approach to Provide State Transportation Agency Critical Services during Emergencies

Purpose. Develop Continuity of Operations (COOP) and Continuity of Government (COG) plans to define activities that must be performed if an emergency event affects access to essential operating and maintenance facilities, vehicle fleets, systems, and senior management and technical personnel.

Actions. Establish a common understanding with community, state, and federal jurisdictions of the capabilities and distinct types of emergency response equipment available. Develop a state transportation agency COOP. Supporting actions may require the agency to

• Develop a state transportation agency COG Plan.
• Acquire or pre-identify key equipment and supplies specified in the COOP.
• Identify response resources and develop an asset inventory conforming to NIMS resource typing standards, including DHS standards as identified by FEMA’s National Integration Center (NIC). When feasible, propose modification or new resource definitions to the NIC to include in the resource typing effort.
• Identify strategies to obtain and deploy major equipment, supplies, facilities, and systems in sufficient quantities to perform assigned missions and tasks.
• Implement an effective logistics system to mobilize, track, use, sustain, and demobilize physical and human resources. The system must support both the residents in need and the teams responding to the incident.
• Develop Personnel Resource Lists that identify appropriate personnel available to support various incident types. Include contractor and NGO personnel.
• Develop Equipment/Materials Resource Lists that identify equipment and materials needed and available for various incident types. Include contractor and NGO resources.
• To the extent permissible by state and local law, ensure that relevant national standards and guidance to achieve equipment, communications, and data interoperability are incorporated into state and local acquisition programs. Share these lists with appropriate local, state, and regional EMAs.
• Develop extended/emergency staffing plans, including suspension of vacation and leave and overtime/compensatory time provisions, and self-sustaining teams as warranted.

Focus. In many cases, the state may have also developed a COOP and/or COG Plan to define the activities that must be performed to respond to DHS NTAS Alerts and Bulletins and emergency events that affect access to essential operation and maintenance facilities, vehicle fleet systems, and senior management and technical personnel. The state transportation agency should also review these plans to determine what agency-critical services will be required to support COOP and COG activities.

Because state transportation agencies will likely be called upon to support mass evacuations of their regions (or in some cases, shelter-in-place or quarantine—the prevention of evacuation), it is important that they develop a formalized approach to evacuation management that includes plans, policies, and procedures for evacuations with or without notice.

PREPARE Phase 04: Develop State Transportation Agency Approach to Evacuation/Shelter-in-Place/Quarantine Management

Purpose. Ensure the state transportation agency formalizes its approach to evacuation management, including plans, policies, and procedures for evacuations with and without notice, and its approach to shelter-in-place and quarantine management. As noted previously, NCHRP Report 740, Transportation Guide to All-Hazards Evacuation, provides guidance, tools and templates for all-hazards evacuation planning, including traffic and roadway management strategies, resource typing, modeling, and regional coordination, and also follows the CPG 101 version 2 (2010) steps for planning. Appendix A contains some of these tools and resources. Also, Section 5 contains information on Collaboration and Communication techniques.

Actions. Convene stakeholders to develop and revise evacuation/shelter-in-place/quarantine plans. Include practitioners with previous experience. Supporting actions may include the following:
• Identify goals, objectives, and guidelines for evaluating and updating the plan.
• Identify the ultimate decisionmaker, Incident Commanders, organizations, and those with
  authority and responsibility for evacuation by position; ensure their tasks have been pre-defined
• Identify roles and responsibilities of government agencies, including transportation and public
  safety, and how these agencies coordinate their efforts with each other.
• Identify variations in direction and control for different types of events that require evacuation/
  shelter-in-place/quarantine.
• Conduct practice exercises (at least tabletop) to test the plan for evacuation/shelter-in-place/
  quarantine of vulnerable populations. Be sure to include whole community partners, including
  representatives of diverse groups of persons with access and functional needs, to be part of the
  planning for such exercises, as well as participating in the exercises themselves. Such planning
  and exercises must follow welcoming accessibility principles, as described in TCRP Report 150,
  Communication with Vulnerable Populations, A Transportation and Emergency Management
  Toolkit.
• Identify the number and location of people and vehicles to be evacuated, sheltered-in-place, or
  quarantined.
• Identify primary and secondary evacuation/shelter-in-place/quarantine routes based on
  probability and feasibility of use, survivability, ease of restoration, functional service, and strategic
  location.
• Identify agencies and personnel who will report to the EOC and how they will be notified to report.
• Address shelters and in-place provisions.
• Document decision criteria to be monitored and evaluated prior to issuing an
  evacuation/shelter-in-place/quarantine order
• Identify how and when the evacuation/shelter-in-place/quarantine order is communicated to
  the emergency management community and to the public.
• Define specific criteria for voluntary, recommended, or mandatory evacuation/shelter-in-
  place/quarantine events. Include pre-approved drafts of executive orders for evacuations or
  prevention of evacuation. Describe the time phasing of evacuation/shelter-in-place/quarantine
  execution (i.e., sequential and concurrent activities) for different levels of response.
• Plan for communicating with limited English-speaking individuals and people with special needs
  (e.g., hearing, physical, mental, vision impairments). (See TCRP Report 150 for guidance.)
• Address the use of public transit vehicles, school buses, paratransit, trains, ferries, aircraft, and
  other publicly or privately owned vehicles that may be used during the evacuation. (Note: hereinafter, all of
  these vehicles are referred to generically as transit vehicles.)
• Designate routes and locations for ingress traffic and pre-staged equipment, materiel, and
  personnel along the evacuation/shelter-in-place/quarantine routes, including fuel and personal
  relief facilities for emergency staff and those affected populations. Include a strategy for
  restricting and securing access to evacuated, sheltered-in-place, or quarantined areas.
• Determine policies for rescue and possible evacuation/shelter in-place/quarantine care for pets
  and livestock.
• Determine policies for containing agricultural emergencies, such as traffic control if stop-
  movement or shelter-in-place/quarantine operations are necessary because of the deliberate
  or accidental introduction of foreign plant or animal diseases into the U.S. food supply system>
Step 2—Establish Communication and Information Management Protocols and Mechanisms for Public Outreach

The concept of communications interoperability requires states to ensure that all emergency response participants, including the general public, can be notified of imminent hazards or threats, and the actions to be taken to prepare for, protect against, respond to, and recover from such events. To accomplish this task, the state transportation agency should work through its emergency planning team to establish communication systems that are consistent across the state and region. Such systems should include 24/7 event notification calling trees, shared radio channels to foster information flow during response and recovery efforts, back-up communication systems to mitigate single-point failures of the primary systems, and shared data management systems and/or programs. It is important to note that some TMC software systems have notification subsystems that could be used for this purpose. There are also commercial applications available that provide such capabilities.

As stated in the Simplified Guide to the Incident Command System for Transportation Professionals (FHWA, 2006a), effective communication is based on two broad principles:

1) **Common Operating Picture** to achieve a broad view of the overall situation in order for Incident Command and ICS staff at all levels and jurisdictions to make effective, consistent, and timely decisions.

2) **Common Communications and Data Standards** to ensure voice and data communications flow efficiently through a commonly accepted architecture using clear text and ICS terminology.

The 2016 NIMS update (draft version) emphasizes the importance of planned communications and information management to provide and maintain situational awareness during emergencies and ensure accessibility and interoperability for incident management personnel. Incident information is continuously gathered, reviewed and synthesized, updated, and disseminated through use of plans, processes, standards, architecture, and equipment.

Communication types can be strategic, tactical, support, or public address:

- **Strategic Communications**: High-level directions, including resource priority decisions, roles and responsibilities determinations, and overall incident management courses of action.
- **Tactical Communications**: Communications between command and support elements and, as appropriate, cooperating agencies and organizations. (See Step 2 Phase 05 and Phase 06)
- **Support Communications**: Coordination in support of strategic and tactical communications.
- **Public Address Communications**: Emergency alerts and warnings, press conferences. (See Step 2 Phase 05 and Phase 06)

The key characteristics of an effective communications and information management system are:

- **Interoperable** - systems that enable personnel and organizations to communicate within and across jurisdictions and organizations via voice, data, and video systems in real time.
- **Reliable, Scalable, and Portable** - systems that are suitable for use within a single jurisdiction or agency, a single jurisdiction with multiagency involvement, or multiple jurisdictions with multiagency involvement. Systems should always be ready for mobilization and personnel should have proper training to know how to mobilize them. Scalability means that systems can be readily
expanded to support any incident regardless of type or severity. Portable technologies and equipment ensure their effective integration, transport, and deployment when necessary.

- **Resilient and redundant** - systems that can ensure the availability of communications after an emergency or disaster. Resilient systems are able to withstand damages and continue operating and redundant systems duplicate services through use of diverse and alternative communications methods.

The characteristics of **Common Terminology, Plain Language, and Compatibility** are also important in allowing personnel from different agencies and jurisdictions to understand each other. Compatible systems use data communications protocols, data collection protocols, and, when needed, encryption or tactical language.

Technologies that can facilitate communications include:

- State-of-the-art radio and telephone systems;
- Automated public warning and notification systems;
- Internet and related computing systems (e.g., GIS); and
- Incident management software
- Social media.

With these principles in mind, this portion of the preparation process involves the following two key phases (phase 5 and 6).

**PREPARE Phase 05: Establish Internal State Transportation Agency Communications Protocols**

**Purpose.** Ensure that calling trees and notification systems, including 24/7 event notification protocols, are established to notify state transportation employees regarding emergencies, to communicate with them during emergencies, and to distribute emergency materials in advance of events.

**Actions.** Evaluate use of radio channels, frequencies, trunked radio systems, and use of cellular phones during events likely to result in emergencies requiring activation of the State and/or Regional EOC(s). Establish predetermined frequency assignments, lists of agency channel access, and interagency communication protocols. Supporting actions may include the following:

- Determine how agencies and specific traffic management team personnel will communicate with each other in the field and on which channels.
- Coordinate and support emergency incident and event management through development and use of integrated multiagency coordination systems.
- Develop and maintain connectivity capability between local Incident Command Posts, local 9-1-1 centers, local EOCs, the SEOC, and regional and federal EOCs, FCs, and NRF organizational elements.
- Develop systems, tools, and processes to present consistent and accurate information to incident managers at all levels.
- Specify agency and interagency contact information.
- Establish calling trees and notification systems, including 24/7 event notification protocols.
- Prepare an employee communication strategy, including emergency communication systems and materials for distribution in advance of events. Incident response communications (during exercises and actual incidents) should feature plain language
commands so transportation employees will be able to function in a multi-jurisdiction environment. Revise field manuals and training to reflect the plain language standard.

- Identify single points of contacts, with back-ups, in all jurisdictions and agencies for communications, including the protocols for which to contact under what conditions.
- Define when evacuation personnel are to be notified of a possible evacuation/shelter-in-place/quarantine order prior to its execution.
- Identify contingency plans for use if normal means of communication fail or are unavailable. Include provisions for keeping the public informed of the estimated travel times to safe havens under current and forecast conditions.
- Identify who needs to be informed to begin opening shelters.
- Identify specific contingency plans to be used if conditions change during the course of the evacuation.
- Institutionalize, within the framework of the ICS, the Public Information System, comprising the Joint Information System (JIS) and a Joint Information Center (JIC). The Public Information System will ensure an organized, integrated, and coordinated mechanism to perform critical emergency information, crisis communications, and public affairs functions that are timely, accurate, and consistent. This includes training for designated participants from the governor’s office and key state agencies. The state transportation agency’s Public Information Office (PIO) will generally represent the agency in the JIC and should not issue separate public announcements.
- Standardize incident reporting and documentation procedures to enhance situational awareness and provide emergency management/response personnel with access to critical information.
- Practice sharing information between EOCs, TMCs, and, if appropriate, FCs and other relevant agencies.

Focus. The planning team represents the key agencies and organizations with which the state transportation agency will need to communicate during emergency response and recovery activities. Given the diverse nature of the planning team, it is likely that many of these agencies and organizations will be using different types of communications and information technology equipment, programs, and systems. While identifying these differences is a key step in the planning process, developing and implementing ways to effectively mitigate these differences to ensure interoperability of communications during emergency response and recovery activities is a key—and often very difficult—step in the preparedness process.

PREPARE Phase 06: Develop Media Interface and Public Notification Systems

Purpose. Ensure that the state transportation agency has the capability to provide traveler and evacuation information quickly and accurately to media outlets and the public, generally through the JIC during major incidents.

Actions. Develop Media Interface Guidelines to ensure traveler information is provided quickly and accurately to media outlets and the public. Ensure these guidelines include appropriate instructions to discourage unnecessary or unnecessarily lengthy evacuation/shelter-in-place/quarantine situations. Supporting actions—and these are generally not the state
transportation agency’s PIO during major incidents, but rather are though the JIC created by the state/local EOP—may include the following⁷:

- Designate (preferably) a single spokesperson to provide information to the media and the public.
- Identify communication tools to be used to ensure the community receives information regarding the steps to be taken to prepare for evacuation, the evacuation zone, the routes of evacuation, and location of nearby shelters.
- Develop agreements with traffic reporting services.
- Provide protocols and guidance to these services for involving them in informing the public.
- Establish Broadcast Radio Agreements to ensure that information is provided in a pre-established format within specific timeframes.
- Develop pre-scripted public service announcements and messages and inform the media on their use.
- Establish Cable Television Cooperative Agreements to provide information to targeted populations (e.g., local government channels).
- Establish a process for using Highway Advisory Radio (HAR) AM stations to provide traveler information in the immediate vicinity of the transmitter.
- Establish a process for using mass faxing capability or email to send road closure information to trucking associations, truck stops, inspection and weigh stations, media outlets, and others.
- Establish processes for using Advanced Traveler Information Systems (ATIS), including Internet, kiosk facilities, 5-1-1, and other publicized public information services to inform the public of travel conditions.
- Establish a process for using Dynamic Message Signs (DMSs) to provide timely, accurate information in advance of, and at the scene of an incident.
- Identify foreign language speakers and outlets to communicate with citizens and visitors who may not understand English.
- Establish times for public officials to provide updates and inform the public of when they can expect such updates.
- Ensure the state/territorial Public Information System can gather, verify, coordinate, and disseminate information during an incident. Accomplish this through exercises and drills of the system.
- Use existing Public Information System and/or other communication systems for effective practices and technical aids.
- Social media can help monitor and gather information, disseminate public information and warnings to a broad audience, help with map production and other visualizations, and match services to needs. Issues with social media use include accuracy of gathered information and what information to share and to whom.
- Work closely with ESF #15, External Affairs.

Focus. As has been stated, the general public must be included in the communication of emergency preparedness, response, and recovery efforts, particularly evacuation/shelter-in-place/quarantine orders. In this latter case, the information provided must be clear as to the need for evacuation/shelter-in-place/quarantine, if appropriate. This is most often performed through

⁷ Those resources for public outreach controlled by the state transportation agency, such as TMCs, DMSs, etc., would be activated by the agency, but they should be closely coordinated with the JIC, as appropriate.
media interfaces and notification systems that provide emergency information quickly and accurately through television, radio, Internet, emergency call numbers, DMSs, other ATIS subsystems, and media outlets. It is important to note that the state transportation agency is likely to be carrying out these communication activities while providing support to the Public Information System within the framework of NIMS. As appropriate, the agency should define its public communication protocols in a separate plan or procedure that is maintained as an appendix or annex to its EOP. These plans should also address how emergency information will be communicated to freight haulers and other travelers and tourists in the region. Additional information regarding collaboration and coordination procedures may be found in Section 5 and Appendix A. Refer to TCRP Report 150 on how to establish and engage a community network.

Step 3—Emergency Evacuation/Shelter-in-Place/Quarantine Plans and Traffic Control and Management Protocols and Procedures

FHWA’s primer, Using Highways During Evacuation Operations for Events with Advance Notice, states that “…the most important activity to ensure successful evacuations is development of an evacuation plan that complements a jurisdiction’s emergency response plans” (FHWA, 2006c). With this in mind, this portion of the preparation process involves four phases (phases 8, 9, 10 and 11).

Capacity enhancement, traffic diversion, and demand management techniques are particularly important in planning for evacuations as evacuations will place significant demand on the existing transportation network. Capacity enhancement strategies such as ramp metering and contraflow lanes increases traffic capacity and throughput, while demand management strategies such as staggering work schedules limits traffic demand. Traffic diversion techniques such as use of alternate routes provide the public and emergency responders with safe and efficient evacuation routes. See Table 5 for a summary of key capacity enhancement, traffic diversion, and demand management strategies.

These strategies are incorporated into plans, field guides and checklists, and/or operations manual. These along with Traffic Management Plans (TMPs) or Temporary Traffic Control (TTC) Plans may facilitate the development of an Incident Action Plan. TMPs and TTCs should be developed for predefined severity levels and incident locations. TMPs and TTCs should include specific information about temporary roadways, traffic control signs, pavement markings, channelization devices, traffic control signals, and barriers; work time and/or roadway occupancy restrictions; traffic control changes on detour/diversion routes; inspection requirements; responsibility for installation and maintenance of the traffic control signs; and, contingency plans for unexpected events. Factors such as safety, cost, vehicle delay, and emergency vehicle access, should be considered when developing a TMP or TTC Plan.

MUTCD Part 6 should be consulted for specific traffic control requirements. In particular, see Section 6B.01 Fundamental Principles of Temporary Traffic Control and Section 6C.01 Temporary Traffic Control Plans. The MUTCD standard states that the needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, or on private roads open to public travel (see definition in Section 1A.13), including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents. See also Chapter 2L Changeable Message Signs (CMS) and Chapter 2N Emergency Management Signing. For signal timing strategies during incidents and planned events, see Chapter 11 of the NCHRP Report 812, Signal Timing Manual Second Edition. In addition, the 2016 ITE Traffic Engineering Handbook contains relevant information on planning, design, control, management and operations for transportation incidents, emergencies, evacuations,
disaster recovery, and planned events. The NCHRP Report 740 on All-Hazards Emergency Evacuation stresses the inclusion of all stakeholders including transit agencies as well as considering the needs of all populations including special needs populations and pets when planning for evacuations. Additional information regarding collaboration and coordination procedures may be found in Section 5 and the Collaboration and Coordination Guides in Appendix A of this Guide.

The Traffic Management Center (TMC) deploys and manages traffic control systems, technologies, and assets; performs emergency response, incident response and clearance functions; transportation network monitoring and surveillance; and acquisition/communication of traffic information. The capabilities, plans, data, information, and resources of the TMC can be leveraged by planners to execute the phases in this Step.

**PREPARE Phase 07: Establish Applicable State Transportation Agency Response Management Teams**

**Purpose.** Establish traffic management teams to manage and direct traffic on highways, at critical intersections lacking active signalization, and contraflow operations, as needed. Also establish Hazmat response/disposal teams, debris removal teams, damage assessment teams with self-sustaining capabilities, and bridge assessment teams. Additional teams may include search and rescue teams, crime scene investigators, public works teams, and public health specialists. Ensure that potential team members are trained and qualified, and certified as necessary on equipment they will be using. Ensure that equipment has been inspected and is in working order, and certified as required.

**Actions.** Establish traffic management teams to manage and direct traffic on highways, at critical intersections lacking active signalization, and contraflow operations, and monitor conditions as needed. Also establish Hazmat response/disposal teams, debris removal teams, damage assessment teams with self-sustaining capabilities, and bridge assessment teams to provide emergency response services including road clearance and repair. Be prepared to establish additional teams, if necessary. Provide teams with Personal Protective Equipment (PPE), training, and information packets including necessary forms, information about reimbursement programs and procedures and required documentation. Teams should ideally have pre-assigned personnel with proper training and qualifications, and certifications on equipment they will be using. Equipment should be inspected and in working order, and certified as required. Establish coordination plans with neighboring states and jurisdictions and, where relevant, neighboring countries as well.

**Focus.** Deployment of traffic management teams during emergency evacuations/shelter-in-place/quarantine situations to assist in managing and directing traffic on highways, at critical intersections lacking active signalization, and during contraflow operations can improve the efficiency of evacuation/shelter-in-place/quarantine, access control, motorist assistance, and road clearance efforts and enhance situational awareness as well. Deployment of additional teams can assist with other emergency response needs. If the state transportation agency chooses to develop such teams, then it should also develop plans and procedures detailing when and how the teams will be deployed, how to maintain communications with the traffic management teams, and when and how to withdraw traffic management teams from the affected area to ensure their safety. In addition, coordination plans with relevant jurisdictions and states should be established.
**PREPARE Phase 08: Prepare Traffic Management Performance Measures**

**Purpose.** Perform traffic flow analyses to support emergency evacuation/shelter-in-place/ quarantine and response planning. Perform traffic flow analyses to support emergency evacuation/shelter-in-place/quarantine and emergency traffic management and control plans.

**Actions.** Perform traffic flow analyses, and evaluate key performance measures such as speed and occupancy, throughput and evacuation times. Analyze emergency vehicle access routes and evacuation/shelter-in-place/quarantine route adjustments. Analyze effectiveness of selected transportation roadway actions, transit system actions, and transportation demand management actions to determine impact on performance measures. Use traffic simulation models and evacuation models as appropriate. For various scenarios including a large-scale evacuation, consider scale and patterns of movement, damaged infrastructure, and secondary incidents. For evacuations, consider both notice and no notice events.

Perform traffic flow analyses, evaluating speed, vehicle occupancy, traveler behavior, contraflow, etc., and include in evacuation/shelter-in-place/quarantine route adjustments.

Supporting actions may include the following steps:

- Analyze traffic flow of evacuation/shelter-in-place/quarantine routes focusing on all freeways and major arterial roadways serving the route. Focus on egress and ingress operations separately. Avoid left-turn movements across traffic flow. Divert traffic flow from critical locations (e.g., Points of Dispensing sites in support of the strategic National Stockpile) and bottlenecks that could cause congestion.
- Review transportation segments to establish capacity, evacuation/sheltered-in-place/quarantined population location distribution, potential sheltering and care destinations, distance between these locations, and parallel routes for each identified hazard.
- Develop multiple local flow (feeder) routes connected to the main evacuation/shelter-in-place/quarantine routes, as necessary to achieve optimum efficiency.
- Test contraflow operations, including full set up and breakdown of traffic controls, safety equipment, and materials.
- Identify the distances those evacuated/sheltered-in-place/quarantined must travel to reach a point of safety for each of the hazards identified.
- Identify user groups potentially affecting egress and ingress operations (e.g., regional through traffic, truckers, other interstate travelers).
- Review signal timing strategies and develop strategies to address identified hazards. They include: increasing intersection traffic handling capacity by minimizing the number of traffic signal phases; selecting an existing timing plan with longer cycle lengths; manual control of signal operations; a custom timing plan with alternate route movements; and a contingency plan with an extended phase or cycle to facilitate movement along the alternate route corridor.
- Analyze potential bottlenecks, barriers, scheduled work zones, vehicle restrictions, vulnerabilities and other potential problems in advance to determine an emergency response and evacuation/shelter-in-place/quarantine route. Analyze impact of traffic signal timing and
adjust as necessary. Use FHWA’s Arterial Management Program\textsuperscript{19} for arterial management, traffic signal timing, and access management.

- Plan for countermeasures (e.g., shutting down work zones, suspending vehicle restrictions, suspending toll collections, adjusting/removing ramp metering) to address these issues.
- Develop freeway interchange operations tactics to maximize ramp capacity and prevent evacuation route mainline congestion.

- Control traffic and respond to traffic incidents through joint efforts among transportation, law enforcement, and emergency medical personnel. Use ETO/TIM best practices.
- Consider effectiveness of other transportation roadway actions, transit system actions, and transportation demand management actions described in Tool 3.4, NCHRP Report 740. Include promising actions in analysis.
- Review/modify/suspend timing of drawbridge openings and lock downs.

**Focus.** Regional emergency response and evacuation/shelter-in-place/quarantine events are supported by effective emergency traffic management and signal timing plans and evacuation plans that have considered the full range of transportation roadway actions, transit system actions, and transportation demand management actions and performed traffic analyses and modeling. Metropolitan Planning Organizations can provide outreach support to special needs populations along with modeling and analysis support and access to travel demand data. State transportation agencies should develop procedures for real-time monitoring of emergency vehicle access routes and evacuation/shelter-in-place/quarantine routes and coordination of traffic signals and timing to facilitate the effective flow of individuals to and from the region—done through the support of the TMC.

Automated systems assist TMC personnel in adjusting traffic signal timing. Adaptive signal control technology continually collects information from roadway sensors and adjusts signal timing based on changing traffic patterns to mitigate congestion. Automated traffic signal performance measures also provide cost effective continuous performance monitoring capability and produces information needed by TMC personnel to perform signal retiming.

**PREPARE Phase 09: Develop Traffic Management Plans and Protocols to be Used During Evacuation/Shelter-in-Place/Quarantine and to Respond to Emergency Events**

**Purpose.** Ensure the state transportation agency has plans and procedures for managing traffic during emergencies and responding to emergencies requiring activation of the State EOC (e.g., predesignated traffic control points (TCPs) for intersections along the transportation corridor, alternative emergency response access routes, emergency turnarounds, protocols for communicating and coordinating with construction crews to support traffic control, equipment storage sites for pre-staging anticipated equipment, travel-on-shoulder guidelines, closure and alternate route guide-lines, rapid vehicle and debris removal guidelines, contraflow plans).

This phase currently addresses roadway aspects. Additional guidance that addresses all modes of transportation under state control or influence is included in NCHRP Report 740, “A Transportation Guide for All-Hazards Emergency Evacuation” and in other FHWA guidance.

**Actions.** Develop TMP/TTC Plans with predetermined protocols and provisions for prepositioned equipment for response to emergency events and evacuations/shelter-in-place/quarantine of different severities and scope. Use information and data gathered in PREPARE Phase 08. Supporting actions may include the following:
• Establish TMP/TTC plans for predefined severity levels and incident locations. Plans should include emergency response access routes and alternate routes, and provisions for use of traffic control devices and alternate signal timing plans, and predesignated TCPs for intersections. TTC plans should also include provisions for towing, recovery, and Hazmat response. TTC plans should consider all transportation users including transit users and pedestrians as well as transit and railroad services, and dissemination of traveler information.

• Coordinate the designation of TCPs with state and local law enforcement.

• Consider all modes and networks in addition to highways, local roadways, and private vehicles including surface transit, commuter and regional rail, subways, light rail, ferries, taxis, vans and buses operated by non-transit entities, airplanes, and pedestrians. See Tool 3.3, NCHRP Report 740.

• Use of contraflow lanes will require addressing issues such as transition sections, ramps and crossover points, emergency turnarounds for emergency response providers, traffic control, access, merging, emergency access to transit and rail, use of roadside facilities, safety, labor requirements, and cost.

• Consult evacuation flowchart in Figure 4-2, NCHRP Report 740 for evacuation plans.

• Establish predetermined flowchart for each segment of the transportation corridor.

• Develop travel-on-shoulder guidelines to ensure that highway shoulders are available for emergency use for response vehicles and general traffic, if necessary.

• Establish closure and alternate route guidelines to guide implementation of closures and alternate routes using predetermined routes.

• Establish rapid vehicle and debris removal guidelines including Hazmat response to ensure an efficient process for clearing roadways.

• Establish landing zone guidelines and predetermine landing sites for MedEvac helicopters and traffic surveillance aircraft.

• Develop traffic signal control plans to quickly implement alternative routes and close impacted lanes on the transportation corridor. Establish protocols for communicating and coordinating with construction crews to support traffic control.

• Identify traffic control techniques to provide clear guidance for incident traffic control and allow safe and efficient deployment of closures, detours, and alternative routes.

• Identify corridors equipped with traffic signal preemption for use by emergency vehicles.

• Identify emergency turnarounds, including median breaks/crossovers, to allow emergency response and highway operations personnel to turn around between interchanges.

• Identify emergency access for transit operations, including locations for access to the transit rail lines for emergency response.

• Develop protocols for communicating and coordinating with construction crews to support traffic control.

Focus. Evacuation/shelter-in-place/quarantine events begin at the local level on small roadways and neighborhood streets and progress to the state’s major arterials and interstates. As a result, while it may not be possible to finalize the specific evacuation/shelter-in-place/quarantine routes until the geographic scope and nature of the emergency event is known, emergency planners must remain cognizant of the fact that the design capacity of these thoroughfares may be exceeded during large-scale evacuation/shelter-in-place/quarantine of the region.
TMCs will be able to provide real-time roadway and bridge monitoring and surveillance support and can help develop TMPs/TTC plans and response scenarios for specific events. For TCPs, emergency response provider safety considerations are paramount and therefore applicable OSHA, MUTCD, work zone safety, and related guidelines should be followed.

Planners should identify primary and alternate evacuation/shelter-in-place/quarantine routes that have a high probability of use considering their ease of restoration, functional service, and strategic location. Identify these routes in the state’s Emergency Evacuation Plan, recognizing that their use may change once the scope and nature of the emergency event is known or as the evacuation/shelter-in-place/quarantine progresses. The traffic control and management portion of the Emergency Evacuation Plan (and shelter-in-place/quarantine plans) should address how these changes and other real-time adjustments to defined evacuation routes will be made to ensure the evacuation/shelter-in-place/quarantine continues unimpeded. This includes how the state transportation agency will coordinate changing evacuation/shelter-in-place/quarantine route needs with local, regional, territorial, tribal agencies and neighboring countries.

**PREPARE Phase 10: Coordinate with Neighboring Jurisdictions**

**Purpose.** Coordinate traffic management plans with neighboring jurisdictions and countries that may be affected by evacuation and response operations.

**Actions.** Coordinate plans with neighboring jurisdictions including neighboring countries that may be affected by evacuation/shelter-in-place/quarantine and response operations. Share plans with higher government levels, as requests for additional resources may be necessary. Coordinate state plans with neighboring states, as evacuees may travel to another state to seek shelter or mutual aid may be requested from another state. States should look into integrating plans and creating interstate compacts that encompass all local jurisdictions through EMAC. Use the capabilities of regional organizations, such as the I-95 Corridor Coalition, TRANSCOM, and All-Hazards Consortium to assist in such coordination.

**Focus.** Coordinated planning requires development of contacts and working relationships, regular meetings, and communication channels. Informal partnerships may be formalized through MOUs and other interagency agreements. See NCHRP Report 740 for MOU templates.

The state transportation agency should also work with its neighboring jurisdictions to develop access management and corridor management programs to improve traffic flow and alleviate congestion issues that may occur during the evacuation/shelter-in-place/quarantine. Emergency Evacuation Plans (shelter-in-place/quarantine plans), or separate supporting traffic control and management plans and procedures, should describe or be developed as separate supporting traffic control and management plans and procedures. Plans and procedures should include predesignated TCPs along the evacuation/shelter-in-place/quarantine corridor, alternate access routes for emergency responder access, emergency turnarounds, protocols for communicating and coordinating with construction crews to support traffic control, equipment storage sites for pre-staging anticipated equipment, travel-on-shoulder guidelines, closure and alternate route guidelines, and rapid vehicle and debrisremovalguidelines.

Planned events, training and exercises, and efforts to obtain mutual aid provide opportunities for collaboration.
Step 4—Develop Mobilization Plans for State Transportation Agency Personnel and Resources

Impending emergency events such as hurricanes and wildfires provide some advance notice to emergency responders. This advance notice provides additional time to stage personnel and equipment and fully mobilize response teams prior to the storm’s or fire’s impact. Unfortunately, many emergency events, such as a large-scale terrorist attack, earthquake, or hazardous materials release, occur without notice, and require emergency responders to react quickly and efficiently with minimal information to mobilize and deploy personnel and resources to the affected areas. In doing so, emergency responders must not only work to fulfill their response duties, but they must do so while keeping themselves and others safe. To ensure that emergency responders are capable of meeting these demands, it is critical that Mobilization Plans be developed and exercised for both notice and no-notice emergency events. Developing Mobilization Plans for state transportation agency personnel and resources requires the completion of two phases (phase 11 and 12).

**PREPARE Phase 11: Prepare to Mobilize Response Teams, Equipment, and Resources**

**Purpose.** Ensure readiness to mobilize transportation agency response teams by creating comprehensive Mobilization Plan. The plan should include procedures for the activation of all necessary personnel, testing of all communications equipment, fueling of all vehicles, pre-staging of supporting equipment (cones, barriers, signs, etc.), and implementing established field capabilities to coordinate with local, regional, state, and federal agencies through the NIMS/Incident Command System. Plans should also ensure that resource requirements are identified for each type of emergency, describe how the resources will be obtained, where they are located, and how they will be transported to appropriate staging areas. In addition, plans should address how resource requests can be addressed with minimal notice.

**Actions.** Establish Mobilization Plans. Test all primary and backup wire communications and radio frequencies including remote communications expected to be used during the event, and evaluate contingencies. Ensure response vehicles are fueled and in proper working order.

Supporting actions could include the following steps:

- Perform joint planning for resource acquisition prior to an incident. Address questions such as resource needs for specific events, available resources by agency/source, and how those resources may be acquired.
- Mobilization plans should include activation and demobilization procedures for emergency personnel and equipment. Prior to activation, afford staff an opportunity to ensure the safety of their loved ones and personal property.
- Mobilization plans should also ensure the security of staging areas, TMCs, TCCs, EOCs, and emergency personnel.
- Use resource management best practices to ensure sufficient resources are available to protect responders and those evacuated/sheltered-in-place/quarantined.
- Pre-position equipment and resources at predetermined locations, including portable changeable message signs, food and water, gasoline tankers, mechanics crews, port-a-potties, and other items that may be stored along the predesignated routes. Periodically verify all equipment and vehicles are fully fueled and operable, and other resources are in working order.
- Track and report resources through the ICS structure.
- Be prepared to equip emergency personnel with needed equipment, supplies, and PPE and provide them with information packets including ICS forms, reimbursement forms, and permit waiver forms.
• Prior to activation, afford staff an opportunity to ensure the safety of their loved ones and personal property.
• Incorporate public and/or volunteer organizations into reception and site plans. Be prepared to provide Just-in-Time training for all training needs that have not yet been met, including training for NGO representatives and volunteers as well as state transportation agency personnel.
• Establish field capabilities through the ICS.
• Prepare for implementing the required elements of the reimbursement process.
• Be prepared to use NIMS inter-jurisdictional and interagency information flow and coordination mechanisms.
• Ensure all responsible agencies understand joint priorities and restrictions. Ensure that mobilization plans and incident-specific deployment plans have been exercised, evaluated, and updated.
• Be prepared to manage timely communication of instructions to prepare people in advance of the order to evacuate, shelter-in-place, or quarantine. Establish and test internal and external communications processes and systems.

PREPARE Phase 12: Administer Training Programs

Purpose. Establish employee and contractor training and exercise programs, participate in joint multi-agency training and exercises, evaluate training and exercises, and identify additional activities to improve preparedness.

Actions. Develop interagency training programs to provide a common understanding of the transportation ICS and program guidelines. Establish professional qualifications, certifications, and/or performance standards for individuals and teams, whether paid or volunteer. Ensure that content and methods of training comply with applicable standards and produce required skills and measurable proficiency. Leverage training and exercises provided by other agencies and organizations including the state EMA, DHS/FEMA, state and local responders, FHWA/NHI, LTAP/TTAP, universities and colleges, etc. Evaluate training and exercises, develop After Action Reports, and identify areas for improvement and corrective actions. Implement identified changes to training and exercise programs. Supporting actions may include the following:

• Establish employee and contractor training and exercise programs. Follow state EMA guidelines and schedules as appropriate.
• Incorporate NIMS/ICS into all state/territorial and regional training and exercises.
• In general, training progresses from individuals to intra-agency teams to interagency and interjurisdictional exercises. Also, activities in the training and exercise program progressively become more complex.
• Strive to make training relevant, interactive and specific to real-world problems. Much learning can occur through instructor-student and student-student interactions. Acknowledge experience and knowledge by providing opportunities for participants to share information and practices.
• Provide a chance for learners to reflect on their training. Then, provide opportunities to apply their new learning shortly thereafter.
• Conduct a training needs assessment to determine the types of training along with certifications and credentialing required by job function or position.
  o Identify internal and external requirements and mandates (HSEEP, EMAP, EMPG) including training and exercise frequency, evaluation, and documentation;
• Recipients of EMPG funding should develop and maintain a progressive exercise program and a multiyear Training and Exercise Plan consistent with HSEEP;
• Consider employees’ current and potential responsibilities;
• Consider all employees at all levels with emergency preparedness and emergency management responsibilities, including training and exercise personnel;
• Determine who (what positions) need NIMS Core Curriculum training; seek assistance from the NIC and state NIMS coordinator for additional guidance;
• Consider including other emergency response provides such as police and fire departments, local public works agencies, and contractors.
• Identify what additional training resources may be needed in the community to support response and evacuation/shelter-in-place/quarantine activities.
• Develop state DOT Multiyear Training and Exercise Plan (TEP); hold TEP Workshop to identify exercise priorities and determine schedule of planned exercises, which target groups and categories of personnel will be included, which exercise type will be used, and develop a structured testing schedule for plans.
• Participate in joint multi-agency training and exercises; this should include an all-hazards exercise program based on NIMS that involves responders from multiple disciplines and multiple jurisdictions. Seek to participate in exercise planning to ensure the state transportation agency role is realistic.
• Plan and implement individual exercises. Seek to include all stakeholders, particularly for emergency evacuation exercises.
• Keep key officials, state EMA, and other stakeholders updated on exercise planning and progress. Seek their input as appropriate.
• Always have a safety plan for exercises.
• Perform exercise design and development activities including development of an Exercise Plan (see Appendix F for an Exercise Plan Template), identification of planning team, identification of exercise objectives, scenario design, documentation creation, and logistics coordination.
• Use scenarios to identify traffic and other transportation impacts of route closures, detours, contraflow operations, etc.
• Use drills/exercises to estimate time needed to complete an evacuation/shelter-in-place/quarantine for each of the catastrophic hazards identified and provide this information to highway, public safety, and transit agencies for coordination purposes. Simulations can supplement these estimates.
• Use drills/exercises to estimate the time it takes to have field personnel and equipment in place to support the evacuation/shelter-in-place/quarantine.
• Conduct the exercise by preparing for exercise play, managing the exercise, and conducting immediate post-exercise activities including debriefings and a “hot wash.”
• Start evaluation planning and fill key evaluation roles at the start of the exercise planning process. Create an Exercise Evaluation Guide to document performance of personnel, plans, procedures, equipment and facilities against exercise objectives, and to highlight strengths and weaknesses. Assess exercises on the task level, organization level, and mission level. Evaluators should evaluate only their own agency, profession, and jurisdiction.
• Ensure that all personnel with a direct role in emergency preparedness and incident management or response complete the designated FEMA training.
• Hold an After Action Report meeting, and develop and share After Action Reports (AARs) with stakeholders. AARs highlight strengths and weaknesses observed during the exercise. Remember to document the AAR development process.
• The Improvement Plan or Corrective Action Plan contains actions, responsible parties, target dates, budgets, and reporting procedures for actions taken.
• Track Corrective Actions to completion.
• Incorporate findings, including corrective actions, into the agency’s training and exercise program, plans and procedures.
• Analyze performance trends and results across exercises and take necessary action to support continuous improvement of training and exercises and other preparedness initiatives.
• Review exercise and training TEP schedule to identify and address potential issues.
• Establish or leverage partnerships with and training facilities of other agencies and organizations to coordinate and deliver NIMS training requirements in conformance with NIMS.

Focus. Improve response capabilities and coordination between emergency responders.

Step 4 Observations

Resource management involves managing emergency personnel, equipment, tools, technologies, teams, emergency vehicles and facilities, and is a key component of any Mobilization Plan. Successful resource management optimizes resource use and supplies incident managers and emergency responders with the resources they need, when and where they are needed, without delay.

Successful resource management also requires multiagency coordination and collaboration, and involves the following activities: resource typing/identification, credentialing, planning, inventorying, mobilizing, tracking, and demobilizing resources.

• Resource typing defines minimum capabilities for personnel, equipment, teams, and facilities, and helps agencies request and offer resources. Use your state’s definitions; if your state has none, then use FEMA definitions; note that FEMA leads the development of resource typing definitions.
• Credentialing means the validation of personnel qualifications and experience, standardizes the authorization to perform specific functions and allows authorized responders access to an incident site.
• Inventorying requires the systematic tracking of resources and detailed information about each resource. Inventory software, technologies, and automated systems can facilitate inventorying.
• The mobilization process includes incident-specific deployment planning; equipping; just-in-time training; designating assembly points for logistical support; and delivering resources to the incident on schedule and budgets. The state transportation agency’s Mobilization Plan should recognize that each emergency is different and therefore will likely require different resources to control. For example, supporting the evacuation or shelter-in-place of a region as a result of an approaching hurricane will require different resources than responding to a large scale hazardous chemical release. In this example, the former may require mass evacuations of the region, while the latter may require citizens to shelter-in-place or quarantine.

As stated in the draft NIMS update document, “coordinated planning, training to common standards, exercises, and joint operations provide a foundation for the interoperability and compatibility of resources.” By identifying resource requirements and joint planning for resource acquisition prior to an
incident, agencies will be prepared to address resource needs once an incident occurs. Estimating resource needs requires the state transportation agency to ask: What types of events should the agency prepare for? What resources are already available to the agency? What resources should be obtained through mutual aid?

Because of the recognized differences between emergencies, the state transportation agency—using the all-hazards approach—should therefore identify, to the extent possible, the resources that are needed to respond to each type of emergency identified during the planning process. The agency’s Mobilization Plan should clearly state the location of these resources and how they can be obtained and/or transported to appropriate staging areas.

These processes help incident managers and personnel protect the safety of staff and the security of supplies and equipment, while enabling them to better direct the movement of personnel, equipment, and supplies to the areas of most need. Next, the state transportation agency’s Mobilization Plan should identify primary and alternate staging areas and rallying points for agency response teams, personnel, and resources. It is important to note that during no-notice events, the agency may need to issue real-time instructions to its personnel. The Mobilization Plan should clearly define how instructions and any changes to these locations will be communicated to transportation agency personnel and other emergency responders during emergency response efforts.

Mobilization Plans should also identify how transportation agency personnel and resources will be transported (if necessary) from the staging areas and rallying points to the emergency scene. As emergency response efforts progress, the agency will need to communicate the estimated arrival times of its personnel and resources to the Incident Commander.

Mobilization also requires that the state transportation agency ensures all personnel and resources are fully prepared and capable of meeting the response needs. This means verifying that all equipment and vehicles are fully fueled and operable, and establishing processes and testing communication systems to ensure information can be shared with and received from the TMC, Incident Command, and other emergency responders. It also means verifying personnel have the appropriate training and qualifications to support response efforts; coordinating traffic signal systems across jurisdictions to support evacuation/shelter-in-place/quarantine efforts as needed; clearing all work zones along evacuation/shelter-in-place/quarantine routes; verifying that traveler information systems are operational and prepared for use; ensuring evacuation/shelter-in-place/quarantine routes have appropriate signage; and verifying that adequate support supplies are available for response personnel if it appears the response effort will last for an extended period of time.

Finally, the state transportation agency Mobilization Plan should address how the agency will maintain the security of its staging areas. This includes emergency and security provisions and procedures to ensure protection of TMCs, Traffic Control Centers (TCCs), EOCs, the personnel staffing these facilities, and their functionality. As with all other plans and procedures discussed in this Guide, it is also imperative that the agency train its personnel and exercise the plans.

With respect to sources of training and exercises and technical assistance regarding training and exercise development, the NIC, DHS/FEMA, and state EMAs have significant knowledge and resources. Also, the FHWA Peer-to-Peer (P2P) program offers technical assistance including training and education on traffic incident management/planned special event planning, procurement, deployment, and operations. Memberships in professional organizations can be leveraged to take advantage of their training and
certification programs. Organizations include American Public Works Association, American Road and Transportation Builders Association, the American Traffic Safety Services Association, AASHTO’s Transportation Curriculum Coordination Council, International Municipal Signal Association. Note that training and practice can also take place through actual events. Use small events to practice coordination and deployment of resources. Use large planned events to practice transportation coordination, interdisciplinary and interjurisdictional communications, traffic control, transit deployment, and other measures. Further information on training and exercises is contained in Section 6.

Step 5—Ensure Cost Tracking and Accountability

Cost tracking and accountability are not only an important part of the Incident Command System structure, but in most cases, federal reimbursement programs (e.g., FHWA Emergency Relief and FEMA Public Assistance), mutual-aid agreements and resource-sharing provisions and programs such as EMAC also require that such costs be fully accounted for in order for the state transportation agency to be reimbursed. Ensuring cost tracking and accountability involves the final phase of the preparation process, as described below.

PREPARE Phase 13: Prepare for Cost Accounting and Tracking of Expenditures

Purpose. Ensure processes have been developed to track resources, making certain of applicable reimbursement and accountability for compliance with federal reimbursement programs and mutual-aid provisions.

Actions. Costs should include all response, scene-management, debris-removal, and other incident-related costs. These costs should also include compensation claims for all forms of workers’ compensation, tort claims against responders, and daily wage reimbursement claims; procurement costs associated with vendor contracts and equipment purchases or rental; and equipment and infrastructure damage costs claims. It is important to stress conformance to FEMA/FHWA record-keeping requirements because this is the only substantial source for reimbursement. Federal audits can and have resulted in reclaiming funds when exact adherence to their guidance is not achieved.

Solid business and management practices and good relationships with FHWA, FEMA, state EMA and local public agencies and other key stakeholders; training all relevant personnel including accounting & financial personnel in each program and procedures; leveraging technologies that can be used for multiple purposes including in daily operations are helpful. Also, be sure to keep up with new legislation which can affect FHWA and FEMA guidance on the reimbursement programs. Additional good practices include having predesignated reimbursement coordinators, predesignated damage assessment teams, pre-prioritization of routes/locations for assessments, use of unique project codes for disasters, development of administrative packets with necessary forms for emergencies, electronic storage of documentation in central location/drive, development and review of a Checklist to determine eligibility for reimbursement programs, use of ICS forms, electronic reimbursement forms and electronic signatures, use of emergency waivers, preapproved contractors, training using scenarios from past disasters and training state EMA staff and local public agencies on reimbursement procedures, asset management and modeling tools such as a bridge management system and HAZUS to predict impact of disasters, use of situational awareness technologies/tools and weather sensors, RWIS, and other technologies to gain better information about the situation and share relevant information, premobilization inspection of vehicles and equipment, mapping of historic damages to show repetitive losses, use of GPS / AVL equipped fleet for fleet management, use of After Action Reports to improve reimbursement processes, and automated van to record damages and pre-disaster conditions.
(See Case Studies for Tennessee DOT and Louisiana DOT for examples of best practices in tracking costs and ensuring appropriate reimbursement. Additional practices are available in NCHRP Synthesis 472.)

Focus. Recoup monies expended during the response effort.

Respond to the Emergency

Achieving NIMS compliance requires state transportation agencies to become familiar with and understand the NIMS/ICS and NRF structure and their roles and responsibilities in that structure. During the PLAN step, state transportation agencies seek to identify the possible hazards and risks to which their regions may be exposed; they work to form collaborative relationships with other emergency response agencies and personnel; they begin developing plans and procedures that will guide emergency response activities and minimize risks; and they begin to identify the resources needed to adequately respond to different types of emergencies.

During the PREPARE step, state transportation agencies also develop and begin to implement supporting plans and procedures; they begin testing response capabilities through emergency drills and simulations; and they establish processes for managing resources and tracking costs. Regardless of the amount of planning and preparation that takes place, however, actual emergency response activities are the truest test of the state transportation agency’s readiness and ability to respond to an emergency, as it places each of the preceding plans, procedures, and supporting activities into action.

To pass this test and to be successful in the emergency response effort, state transportation agencies must not only fulfill their roles and responsibilities within the National Incident Management System/Incident Command System structure, but they must also do so safely. Indeed, successful emergency response emphasizes safety at all levels. Thus, the goal of emergency response is not only to protect the affected region and its citizens from harm, but also to do so without injury or loss of life to emergency response personnel. All too often, the services that emergency responders provide are taken for granted as response activities focus on saving the lives of those affected by the emergency event. And all too often the risks that emergency responders face, placing themselves in harm’s way, to perform their duties and maintain public safety, are neglected. It is the responsibility of every emergency response participant—from responders to managers and executives—to remain cognizant of these risks and to perform their duties in a manner that maximizes the safety of response personnel throughout all response activities.

The NIMS/ICS structure is designed to provide a systematic, shared tool with which to command, control, and coordinate emergency response activities that are consistent across all response agencies. It is therefore the most useful and effective means of minimizing response risks and of maintaining safety during all emergency response activities, at all levels of the emergency response effort.

It is recognized that the size and location of the emergency event will greatly affect the number and types of agencies involved in the response effort. A crash involving an overturned tractor-trailer that blocks traffic on one of the state’s main interstates, for example, will obviously require different response actions than in response to a large-scale terrorist attack or the threat of an impending hurricane. It is also recognized that the state transportation agency’s role in the response effort will also vary greatly depending on the size and type of emergency event. Given these uncertainties, a generalized approach is taken within this section of the 2017 Guide to discuss a state transportation agency’s emergency response roles and responsibilities. It has also been assumed that the agency will always fulfill a support role in the
emergency response effort—not serving as the lead emergency response agency, but instead receiving direction from the state or some higher government authority.

These assumptions are made for two reasons: (1) state transportation agencies already have a high degree of familiarity with small-scale emergency response activities such as those required by the tractor-trailer example cited above, and (2) these assumptions present the scenario most likely to be faced by a transportation agency.

The following has been developed to provide state transportation agencies with the tools necessary to evaluate the effectiveness of their own emergency response processes against the standards and metrics required by the National Incident Management System and to provide additional detail on how to best implement and work within the Incident Command System structure. Self-assessment checklists for state transportation agencies are included in Appendix A.

Step 1—Initiate Emergency Response
Initiating emergency response from the state transportation agency perspective involves three phases (phases 1, 2 and 3).

RESPOND Phase 01: Detect and Verify Emergencies
Purpose. Monitor the performance of the transportation network using surveillance systems, field personnel, manual or automated information sharing with local Emergency Communications Centers (ECCs)/9-1-1 Centers (also called Public Safety Answering Points [PSAPs]), and regional transportation organizations.

Actions. Use surveillance systems to detect indicators of a potential emergency, an emergency that is occurring, or an emergency that has occurred. Coordinate with and alert other agencies to recognize an emergency event in progress that may affect the regional transportation system. Activate manual or automated information sharing with local ECCs/9-1-1 Centers. Coordinate with field personnel and equipment to verify that an emergency event is occurring or has occurred and communicate relevant information to all responding agencies. Where they exist, use regional networks, such as the I-95 Corridor Coalition’s Incident Exchange Network, for such notifications.

Focus. Once the state transportation agency has been notified of the emergency event, it must take the necessary response actions to support the Incident Command System structure. This means activating its Mobilization Plan by notifying transportation agency personnel and response teams of the event and directing these staff to report to the appropriate staging areas or control centers. The agency should also mobilize all other resources, such as vehicles and equipment necessary to support emergency-response activities. Once state transportation agency response personnel arrive at the designated staging area or command center, they should be briefed fully on the situation and begin to take the response actions that have been developed and exercised during the emergency planning and preparedness phases. This includes activating the applicable operating procedures, traffic control, and management protocols, and other plans and procedures that guide the agency’s response activities.

RESPOND Phase 02: Assess Status of Transportation Infrastructure
Purpose. Receive reports from automated systems, field personnel, law enforcement, and/or a Fusion Center regarding the status of the transportation infrastructure.
**Actions.** Receive cell phone calls from motorist(s) to report incidents and conditions directly to the state transportation agency. Receive reports from road watch, first observer, volunteer spotter, and other probe programs to enable specially trained individuals (including transit vehicle operators) to provide information by radio or cell phone. If available/applicable, use automated vehicle location (AVL) identifiers in vehicles that travel a transportation corridor regularly to track vehicle movement and compare it against anticipated travel times to identify delays and potential incidents. Where available, use cell phone tracking data to obtain near real-time travel time information. Supporting actions may include the following:

- Coordinate with/manage 24-hour law enforcement patrols to enhance detection, response, and site management with dedicated officers available at all times in the transportation corridor.
- Coordinate with/manage specialty patrols (motorcycle, aircraft) to provide surveillance of roadway conditions for incident detection, verification, response, clearance, and recovery.
- Operate dedicated incident response patrols to provide early detection, verification, response, clearance, and recovery.
- Ensure patrol vehicles are equipped to help stranded motorists and some are equipped to quickly remove a disabled vehicle or debris from the roadway.
- Use automated detection systems, including loops, microwave, radar, and video, to detect congestion on the highway.
- Use video surveillance equipment, mounted within the transportation corridor, to provide incident detection. Video equipment can be combined with automated detection and reporting systems. Video can also be used to verify the occurrence of an incident and to identify the appropriate response equipment needed.

**Focus.** Ensure the safety of transportation infrastructure elements that may be used to support evacuation of the affected area or response efforts. In its support role, the state transportation agency should provide the Incident Commander with updates as to the continued viability of emergency access and emergency evacuation routes to and from the affected area. The agency’s Emergency Planning Coordinator should attend, or assign an agency representative to attend, all incident briefings held by the Incident Commander to gather and share any additional information that may be necessary to support the response effort.

**RESPOND Phase 03: Gain and Maintain Situation Awareness**

**Purpose.** Receive notification of all declared emergencies and ensure that situation reports contain verified information and explicit details (who, what, where, when and how) related to the incident/emergency.

**Actions.** The state transportation agency should receive notification of all declared emergencies and then continuously monitor relevant sources of information regarding actual incidents and developing hazards. The scope and type of monitoring varies based on the type of incident being evaluated and needed reporting thresholds. Supporting actions may include ensuring critical information is passed through pre-established reporting channels according to established security protocols and ensuring situation reports contain verified information and explicit details (who, what, where, when and how) related to the incident. Status reports, which may be contained in situation reports, relay specific information about resources. Based on an analysis of the threat(s), issue warnings to the public and provide emergency public information.
Step 2—Address Emergency Needs and Requests for Support

As emergency response efforts progress, the state transportation agency may be called upon to provide additional information and resources as necessary to support ongoing response operations. Fulfilling unexpected and ongoing requests for support requires the agency to maintain a high degree of readiness and sufficient resources, or the ability to obtain such resources with limited notice. This requires the completion of two phases (phase 4 and 5).

RESPOND Phase 04: Coordinate Response to the Emergency

**Purpose.** Activate appropriate plans, procedures, and protocols and mobilize available personnel, equipment, facilities, devices, and information to support emergency response. As appropriate and/or as requested, provide field support for emergency responders at the scene, integrated through the ICS and communicated and coordinated with the TMC.

**Actions.** Activate appropriate plans, procedures, and protocols based on the type of emergency. Activate Incident Management Teams in accordance with NIMS. Activate Specialized Response Teams, including search and rescue teams, crime scene investigators, public works teams, hazardous materials response teams, public health specialists, or other personnel, as appropriate. Supporting actions may require the agency to do the following:

- Mobilize pre-positioned assets and supporting equipment.
- Manage all emergency incidents and preplanned special events in accordance with ICS organizational structures, doctrine and procedures as defined by NIMS.
- Coordinate requests for additional support.
- As appropriate and/or as requested, provide field support for emergency responders at the scene, integrated through the ICS, and communicated and coordinated with the TMC.
- Activate logistics systems and venues to receive, stage, track, and integrate resources into ongoing operations. ICS should continually assess operations and scale and adapt existing plans to meet evolving circumstances.
- Address emergency responder transportation needs and scene access support and staging requirements.
- Identify available transportation equipment, facilities, personnel, devices, and information to support emergency response.
- Assign transportation agency resources to move materials, personnel, and supplies as requested by responders.
- Track resource status.
- If appropriate, support hazardous materials containment response and damage assessment by using available capabilities coordinated with on-scene field response through the ICS.
- Ensure that nonhazardous materials, particularly small vehicle fluid spills, are removed from the transportation facility—initially travel lanes/tracks—as quickly as possible.
- Attend regular briefings at the incident site regarding the situation, incident action plan, response objectives, and strategy, with full opportunity for transportation contributions and identification of resources and capabilities to support the response effort and action plan.
- Perform damage assessment responsibilities for affected transportation system elements.
- Make/recommend decisions regarding closures, contraflow operations, restrictions, and priority repairs.
• Coordinate assessments and decisions made regarding the operational capabilities of the transportation system with affected parties (emergency responders; local, state, and federal government; etc.).
• Initiate priority clean-up, repair, and restoration activities, including the use of contractors and emergency procurement authorities.
• Review and, as necessary, terminate existing work zone activities and/or closures to the extent possible.
• Obtain incident status briefings and anticipate changing conditions (wind direction, weather, plume direction, etc.).
• Based on all available information, develop detours and diversions (as necessary) to direct traffic safely away from the affected area and/or damaged infrastructure.
• Prioritize and clearly communicate incident requirements so resources can be efficiently matched, typed, and mobilized to support emergency operations. Initiate traffic management operations and control strategies.
• Provide public information/traveler alerts on the status of the transportation system.
• Assign personnel to Regional and State EOCs to coordinate with and assist public safety agencies and other agencies involved in disaster response and recovery efforts.
• Support communications between transportation personnel and their families/friends.

**Focus.** Improve emergency response capabilities.

**RESPOND Phase 05: Evaluate Need for Additional Assistance from Neighboring States, Jurisdictions, and/or Federal Government**

**Purpose.** Coordinate requests for additional support with appropriate jurisdictions following previously established mutual-aid plans.

**Actions.** Evaluate the need for additional resources and whether to request assistance from other states using interstate mutual-aid and assistance agreements, such as the EMAC. If the incident overwhelms state and mutual-aid resources, then the governor should request federal assistance and/or deploy the State Department of Military/National Guard.

**Focus.** Determine whether to enact MOU/As to gain additional assistance as necessary to respond to the emergency event.

**Step 3—Manage Evacuations, Shelter-in-Place, or Quarantine**

Once ordered, all parties must support the decision to evacuate, shelter-in-place, or quarantine an affected area. Perhaps the most significant role a state transportation agency will play during the emergency response effort is that of helping to manage the evacuation/shelter-in-place/quarantine of the affected region(s). Once the decision is made and the state has activated its Emergency Evacuation Plan, the agency must begin implementing its traffic control and management roles and responsibilities as stated in the Plan. This may include working and coordinating with local, state, and regional TMCs and TCCs to manage traffic signal timing, message signs, and other public information systems; deploying response teams, equipment, and other resources as necessary to direct and facilitate traffic flow and remove debris; activating and coordinating contraflow activities along evacuation/shelter-in-place/quarantine routes; and monitoring progress and providing the Incident Command Team with
updates regarding the continued viability of primary routes and the need to begin using alternate routes. Managing an evacuation/shelter-in-place/quarantine requires the completion of two phases.

**RESPOND Phase 06: Make and/or Support Decision to Evacuate, Shelter-In-Place, or Quarantine**

**Purpose.** Coordinate with appropriate local, regional, and state officials regarding evacuation/shelter-in-place/quarantine orders and routes.

**Actions.** Determine the probability of impact (depending on the nature of the event). Estimate the effects on the geographic area and types of people and materials to be evacuated, sheltered-in-place, or quarantined. In terms of the decision made, consider the timing of the event and the lead time to initiate the action; weather conditions and their potential effects on evacuation/shelter-in-place/quarantine. Evaluate the economic impacts of such a decision on the public and private sectors. Supporting actions may include the following:

- Determine the condition and availability of evacuation/shelter-in-place/quarantine routes or controls points.
- Determine whether neighboring jurisdictions have made an evacuation/shelter-in-place/quarantine decision.
- Determine the population potentially affected by the action, including jurisdictions that will be hosting those evacuated, sheltered-in-place, or quarantined.
- Determine the availability and safety of personnel to support the action.
- Determine whether to deploy separate teams to notify residents and ensure their evacuation, or other means to notify people of the shelter-in-place or quarantine decision.
- Consider the personal needs of those evacuated, sheltered-in-place, or quarantined and the needs for vehicle servicing, particularly fuel, and whether power and other utilities should be terminated for safety.

**Focus.** Implement the unified command structure.

**RESPOND Phase 07: Issue and/or Support Evacuation/Shelter-in-Place/Quarantine Order**

**Purpose.** Mobilize the state transportation agency activation team to coordinate evacuation, shelter-in-place, or quarantine operations.

**Actions.** Issue evacuation/shelter-in-place/quarantine orders through established communication systems and protocols. Notify service organization, local, regional, state, and federal stakeholders, including sheltering organizations, as applicable.

**Focus.** Implement the Incident Command System structure.

**Step 4—Implement Emergency Response Actions**

To support implementation of emergency response efforts, the state transportation agency may be called upon to identify access routes to the emergency scene and to monitor these routes as response efforts progress to ensure routes remain viable options for responder entry and exit. The agency must be prepared to communicate all changes to entry and exit routes to the Incident Command Team through the ICS structure. The agency may also be required to deploy its own response teams and personnel to manage traffic flow and debris removal along emergency responder entry and exit routes. Implementing emergency response actions requires completion of three phases (phases 8, 9 and 10).
**RESPOND Phase 08: Take Response Actions**

**Purpose.** Implement emergency transportation operations activities as required (e.g., open/ close routes, manage traffic flow, deploy debris-removal teams, activate contraflow operations, coordinate to ensure that unmet transportation resource needs are identified and requests for additional support are made, provide and receive briefings, and support those with special needs).

**Actions.** Implement the Incident Command System and chain of command and/or Unified Command to create an integrated team of multidisciplinary and multi-jurisdictional stakeholders. Implement primary and (as needed) secondary command posts. Supporting actions may require the transportation agency to do the following:

- Deploy transit resources to support evacuation, including accommodating vulnerable populations, as well as resources to accommodate pets on transit vehicles and/or in shelters.
- Enforce evacuation/shelter-in-place/quarantine orders. The Emergency Operations Team should engage public safety officials in going door-to-door to ensure residents know of and comply with the order.
- Place services at intervals along evacuation route(s). Arrange for emergency services within a shelter-in-place or quarantine area, as needed.
- Open evacuation/shelter-in-place/quarantine routes to maximize throughput (e.g., close toll operations, work zones).
- Activate mutual-aid agreements.
- Determine the need for and deploy emergency medical and other support staff staged along the emergency routes or attached to those working with vulnerable populations, or within or near a shelter-in-place or quarantine area.
- Determine the need for and deploy debris-removal crews to clear blocked highways and/or other transportation facilities.
- Determine the need for and, as needed, deploy sanitation crews with mobile comfort stations (e.g., portable toilets, wash areas).
- Coordinate local evacuation/shelter-in-place/quarantine incident action plans with the designated incident commander in the field and the EOC/TMC. Field and EOC commanders should coordinate incident action plans with neighboring jurisdictions and the state or neighboring state(s). The EOC should obtain updated information frequently and communicate this information to those evacuated/sheltered-in-place/quarantined throughout the event.
- Set up and monitor contraflow operations to ensure traffic is flowing safely and efficiently. Use shoulders, HOV lanes, reversible lanes, and frontage roads for evacuation traffic.
- Activate and strategically station additional TIM clearance crews if possible to quickly assist motorists and remove stalled or damaged vehicles from lanes of traffic to preserve maximum traffic flow.
- Coordinate and communicate contraflow and other special operations with neighboring jurisdictions.
- Coordinate with the next higher level of government to ensure unmet transportation resource needs are identified and requests for additional support are made.
- Control access to evacuation routes and manage traffic flow.
- Control access to shelter-in-place/quarantine areas to prevent unauthorized entry. Include strategies for emergency responders, transit vehicles, and other essential equipment to move inbound against the predominant outbound flow of traffic.
• Provide trained personnel to support the evacuation route or shelter-in-place/quarantine area (e.g., food, first aid, fuel, information).

Focus. Respond within the unified command structure.

RESPOND Phase 09: Deploy Response Teams

Purpose. Deploy personnel and field equipment to implement emergency transportation operations.

Actions. Ensure that field personnel make frequent contact with the EOC through the ICS. Address activation of the TMC if it is not already operational (e.g. during normally inactive periods).

RESPOND Phase 10: Communicate Evacuation/Shelter-in-Place/Quarantine Order and Incident Management Measures

Purpose. Disseminate appropriate information to employees and travelers, and provide updates in a timely manner.

Actions. Brief national, state, and local authorities and personnel (such as transit and health agencies and Fusion Centers) at regular intervals to ensure all parties are provided with accurate, timely, and comprehensive information. Hold regular media briefings to inform the media about evacuation routes and shelter-in-place and quarantine locations, traffic and road conditions, and other pertinent information to communicate to the public in a timely manner. Supporting transportation agencies may do the following:

• Disseminate accurate information pertaining to evacuation orders in a clear fashion and timely manner to avoid shadow or unnecessary evacuations or unnecessarily lengthy evacuation trips.
• Implement a briefing schedule with ranking representatives from each stakeholder agency participating in the event.
• Inform evacuees of available transport modes, how to access them, and if there are any restrictions on what evacuees may carry with them.
• Inform evacuees of when transportation assistance will begin and end and the frequency of departure at designated pick-up locations.
• Inform evacuees of their destination before boarding public transport.
• Inform the public and/or family members of the evacuees’ destinations.
• Identify established websites, hotlines, text messaging groups, etc., where people can get answers to their questions and concerns. In the event of a shelter-in-place or quarantine situation, inform people of the nature of the danger and actions they should take.
• Communicate security measures to the public.
• Identify support services for those with special needs.
• Communicate critical operational changes to the EOC and the public.
• Communicate information to evacuees on the availability of nonpublic shelters, such as hotels. Keep shelter operations informed of the location and status of other shelters.
• Communicate information to those to be sheltered-in-place or quarantined.
• Regularly reinforce, internally and externally, that persons involved in any way with the evacuation/shelter-in-place/quarantine event must direct all but the most basic inquiries to the JIC. Personnel working on the event must maintain effective communications at all times to coordinate movements, share real-time information, and track deployments.
• Ensure that response services from other states and jurisdictions, including first responders and private sector utility, debris management, and similar responders, have information on available and appropriate routes into the impacted area (including weight, height and width restrictions), and have expedited access through neighboring states.

• If your state is a “pass-through” state enroute to a disaster, implement established protocols for fleet toll procedures and weigh station deferrals.

• Establish processes to ensure redundant communications systems are available during the evacuation/shelter-in-place/quarantine because the event may damage or disable primary communication systems.

• Program DMSs (permanent and portable) as necessary to provide accurate, up-to-date information.

• Program HAR subsystems to provide accurate, up-to-date information.

• Program 5-1-1 systems to provide accurate, up-to-date information.

• Relay traffic condition information to the EOC.

• Ensure 9-1-1 operators are fully informed of conditions so they can respond to callers with accurate, up-to-date information.

Use ITS resources during an evacuation to collect data and as a tool to communicate and coordinate with evacuees, evacuation operations personnel, partners, and other stakeholders. In shelter-in-place/quarantine areas, use ITS to detect unnecessary movements that might result in innocent people being further jeopardized.

Step 5—Continue Response Requirements

As the emergency response effort progresses, the state transportation agency’s roles and responsibilities will likely change and evolve. As discussed throughout this section, the agency must be capable of monitoring the response effort, including ongoing traffic conditions and adjusting to changes as they occur. This is best done through the ICS structure and close coordination with other emergency response agencies and stakeholders. Continuing response requirements involves two phases (phases 11 and 12).

RESPOND Phase 11: Monitor Response Efforts

Purpose. Monitor traffic conditions and make operational adjustments.

Actions. Monitor traffic conditions on evacuation/reentry routes and adjust operations to maximize throughput. Monitor how the event that triggered the evacuation/shelter-in-place/quarantine is progressing and if there are any changes to earlier predictions of its effects. Monitor the conditions of the roadway (e.g., for debris or flooding) during the evacuation/shelter-in-place/quarantine so those affected can be prepared and rerouted if necessary. Monitor evacuation/reentry operations of motorized transport, rail, air, waterway, and other transportation modes to determine the adequacy of available resources. State transportation agencies may

• Track the destination of vulnerable populations evacuated/sheltered-in-place/quarantined to notify friends and family of their location and to develop a plan to return them their original locations once the area has been deemed safe for reentry.

• Monitor the number of evacuees moved by means other than personal vehicles to ensure that additional equipment and operators (such as buses and drivers or helicopters and pilots) are requested and supplied quickly, if needed. This information should also aid in developing the reentry plan, as the same transportation resources will likely be required for that operation.
Monitor traffic counters and cameras, pipelines, viaducts, etc., for potential damage.

**RESPOND Phase 12: Prepare for Next Operational Period**

**Purpose.** Mobilize personnel and resources for next operational period.

**Actions.** Mobilize personnel and resources for next operational period.

**Step 6—Conclude Response Actions**

As the emergency response effort concludes, state transportation agencies must prepare to demobilize emergency responders and equipment and restore normal operations. This requires not only transporting emergency responders back from the emergency scene, but also preparing for the recovery process (discussed in the next section). The final phase of the RESPOND step is described below.

**RESPOND Phase 13: Prepare for Demobilization**

**Purpose.** Plan for restoration to normal operations.

**Actions.** Prepare to restore normal activities. Ensure that provisions exist to address and validate the safe return of resources to their original locations. Develop processes for tracking resources and ensuring applicable reimbursement. Develop plans to ensure responder safety during demobilization efforts. Ensure accountability for compliance with mutual-aid provisions.

**Recover from the Emergency**

In many respects, once the emergency has ended, the most difficult part of the emergency management process—recovering from the event—begins. The distinction between recovery and response is important. The skills, resources, objectives, time horizons, and stakeholders all differ dramatically between response and recovery.

Recovery is typically considered to be a series of discrete efforts that take place after an event or disaster and is often considered in phases: an emergency/response recovery period, short-term recovery, and long-term recovery/reconstruction.

During the emergency/response recovery period (typically 1-7 days after the event), assessments must be made of damage caused by the emergency event; utilities such as power and water must often be restored; debris and other potential hazards must be removed from the affected area; and security provisions must be implemented to prevent criminal activities such as looting and theft. Emergency, often short-term, repair of transportation systems occurs and interim transportation services are provided, if necessary.

Additionally, medical treatment must be provided to those injured during the event; those who perished during the emergency must be identified and removed from the scene, and arrangements must be made to notify their next of kin; and transportation infrastructure elements must be examined to ensure their continued integrity and viability of use. Each of these activities can be costly, requiring the use of specialized personnel and equipment to prevent further losses. Each activity must also be completed before those evacuated/sheltered-in-place/quarantined are permitted to return to their homes and businesses.

During the short-term recovery period, emergency demolitions occur and temporary structures and infrastructure may be put in place to replace damaged infrastructure. Long term recovery (typically
several years) consists of the permanent reconstruction and restoration of the transportation system infrastructure.

Planning for recovery (pre-event planning) is an integral part of preparedness. The speed and success of recovery can be greatly enhanced by establishing processes and relationships before an event occurs. Preparing for recovery prior to a disaster reduces the problems of trying to locate required capabilities and create policies when scrambling to manage immediate recovery. Recovery efforts are executed more efficiently when resources are pre-positioned, contractors have been pre-approved and alternate facilities are already identified. **NCHRP REPORT 753: A PRE-EVENT RECOVERY PLANNING GUIDE FOR TRANSPORTATION (2013)** provides approaches and resources for post-event assessment and rapid recovery.

Having a recovery plan is different from just modifying or adding on to the existing emergency response plans. Pre-event recovery planning helps establish priorities, structure, and organization; define roles and responsibilities; determine resources to be pre-positioned; and identify approaches to support the recovery process. A number of considerations should be taken into account when embarking on a pre-event planning process. An effective pre-event recovery process helps ensure that the recovery process is conducted quickly, efficiently, and cost effectively while limiting disruptions and improving the transportation infrastructure after the recovery.

To quickly and efficiently implement disaster recovery, a recovery organization with clear authority and responsibilities needs to be identified prior to the event. It is recommended that the recovery team be involved in the planning process and, given the demands of recovery operations, should be separate from the emergency response organization. It is important that recovery team members understand what their responsibilities and how they interact with the emergency response team and others involved in recovery.

As with each of the other emergency management phases, it is important to take every precaution to ensure the safety of personnel involved in the recovery operations. This is, again, best achieved through the NIMS/ICS structure and the continued coordination with other emergency response agencies and stakeholders. In many cases, additional resources may also be available from neighboring jurisdictions and regions, or even far away states and neighboring countries in case of a major disaster, as well as the state and federal government in the form of the National Guard. The ICS structure provides a simplified means through which these resources can be obtained and managed.

The following has been developed to provide state transportation agencies with (1) the tools necessary to evaluate the effectiveness of their own recovery processes against the standards and metrics required by the National Incident Management System and (2) additional detail on how to best implement and work within the Incident Command System structure during recovery operations.

**Step 1—Restore Traffic to Affected Areas**
Short-term recovery efforts often overlap with response and focus on providing essential services and re-establishing critical transportation routes. During recovery operations, the state transportation agency—along with partner agencies, such as transit systems—will likely be called upon to assess, restore, and manage the essential transportation services and infrastructure elements of the affected area, as necessary, to complete the recovery effort. This may require deploying specialized teams to (1) conduct damage assessments of transportation infrastructure, (2) remove debris and hazardous materials from primary and alternate reentry routes, and (3) repair any roadways or other transportation facilities
needed to support the recovery effort and the phased return of those evacuated/sheltered-in-place/quarantined to their homes.

Becoming familiar with the damage assessment process and who is responsible before an event provides a head start on the recovery process once an event occurs. Multiple organizations—from State and local DOTs to Federal regulatory agencies—are likely to be involved in damage assessment, and each may have their own methodology and time-frame requirements.

Timely debris removal is critical. The collection, hauling & disposal of debris after an event can be massive and costly. States or local jurisdictions that have had a major debris generating event highly recommend have contracts in advance for debris removal. Another option is to use an emergency contract to get the debris operations started and then issue a standard contract for the longer-term debris management, using the time while the emergency contract is in place to negotiate better pricing for the longer contract. NCHRP REPORT 781: A DEBRIS MANAGEMENT HANDBOOK FOR STATE AND LOCAL DOTs AND DEPARTMENTS OF PUBLIC WORKS (2014) covers the development of a debris management plan, contracting, monitoring, site selection, removal, final debris removal, and operational closure.

Taking a phased approach to recovery such as using temporary solutions and considering multi-modal approaches, can quickly restore movement to an affected area and expedite recovery.

As part of Continuity of Operations Planning (COOP), the annex on “Reconstitution” is an opportunity to include information on which infrastructure assets might need to replaced or relocated in the process of resuming normal agency operations.

Restoring traffic to affected areas requires completion of four phases.

RECOVER Phase 01: Restore Essential Services

Purpose. Conduct damage and recovery assessments, remove debris and restore essential transportation services in the affected areas.

Actions.

- Conduct damage assessments. It may be dangerous for an assessment team to be in the area after the event or there may not be enough survey teams to cover the entire affected area. Remote sensing technologies can overcome these limitations.
- Identify who has overall responsibility for managing debris removal.
- Identify potential staging and debris storage areas. Be aware of unintended consequences of decisions made during response and recovery. For example placement of debris for pick-up and locations selected for debris storage can impede access needed for recovery actions.
- Develop a long-term plan for debris removal. Understand what types of debris to expect and how best to remove/clean up those types of debris. Different types of events create different types of debris.
- Provide information to community about what they should do to help – and not hinder- the debris removal process when they clean up their own homes and properties. An illustration is provided on the cover of the Debris Management Handbook from the state of Louisiana that was published in the local newspaper to clearly provide that information.
• Determine how to accommodate oversize and overweight vehicles to minimize subsequent damage to roadways and transportation infrastructure.
• Conduct emergency repair of roads and other transportation facilities to restore essential services to the affected area. To quickly restore movement to an effected area, temporary solutions can be put in place such as installing temporary bridges or roadways or offering alternate modes of transportation such as ferries or buses.
• Facilitate fleet movements of recovery support vehicles (e.g., power and communications restoration crews, debris removal crews, and emergency food, water and supply vehicles) through non-affected areas into affected areas. Designate routes and supply information on road status, height and weight limits, and similar information. (This applies if you are an unaffected, “pass-through” state without a disaster declaration as well as the state affected by the disaster.)
• Get conditional waivers in advance for short-term use of certain assets that may carry weight, size, or material restrictions, if required.

Focus. Restoration of economic supply chains depend on timely debris removal and efficient detours. Getting things moving again means getting obstacles out of the way, e.g. much of the debris falls on or is pushed onto the roads. Rivers may become impassable. Identifying alternate routes and getting them cleared, if necessary, as quickly as possible is essential.

RECOVER Phase 02: Reestablish Traffic Management in Affected Area

Purpose. Establish routes to move traffic into, out of, and/or around affected areas.

Actions. Designate routes to move traffic into, out of, and/or around the affected area. Coordinate traffic management with restoration plans for affected communities and resumption of government operations and services through individual, private-sector, nongovernmental, and public assistance programs.

Establish a traffic prioritization scheme that determines which type of traffic has priority over another for a certain location or time period.

Transportation mitigation strategies can be grouped into categories based on the objectives and methods of the strategy, such as increasing capacity on existing lanes, using technology, diverting or redirecting traffic and demand management. An overview of transportation mitigation strategies, from how to increase capacity on existing lanes to demand management, organized by the phase of the recovery effort in which they usually occur is provided in the following table. (Table 5)

<table>
<thead>
<tr>
<th>Transportation Mitigation Strategies</th>
<th>Recovery Phases</th>
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<tbody>
<tr>
<td></td>
<td>Short-Term</td>
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<td>Mid-Term</td>
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<td></td>
<td>Long-Term</td>
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<tr>
<td>Increase Capacity on Existing Lanes</td>
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<td>Operate Contraflow Lanes</td>
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<td>Utilize Reversible Lanes</td>
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<tr>
<td>Restrict Lanes for HOV or BAT</td>
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<tr>
<td>Provide HOV Bypass at Bottlenecks</td>
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<tr>
<td>Utilize the Shoulder of a Roadway as an Additional Traffic Lane</td>
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<tr>
<td>Eliminate/Restrict On-street Parking</td>
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<td>Reduce Lane Widths to Accommodate Additional Lanes</td>
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<tr>
<td>Increase Transit Service</td>
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<tr>
<td>Increase Ferry Service</td>
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<tr>
<td>Improve Transportation Incident Management</td>
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<tr>
<td>Implement Traffic Management Technology</td>
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<td>Change Signal Timing to Accommodate Changed Travel Patterns</td>
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**Divert or Redirect Traffic**

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<td>Relocate Ferry Service</td>
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<td>Manage Truck Usage</td>
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<tr>
<td>Designate Emergency Responder Routes</td>
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<td>Conversion of non-motorized trails to restricted use</td>
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**Demand Management**

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<tr>
<td>Increase Bicycle Usage</td>
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</table>

Table 5. Transportation Mitigation Strategies

**RECOVER Phase 03: Reentry into Evacuated, Shelter-in-Place, or Quarantined Area**

**Purpose.** Implement a phased approach to bring evacuated, sheltered-in-place, or quarantined residents and others into the affected area.

**Actions.** Define specifically who makes the decision to return or remove shelter-in-place/ quarantine restrictions. Identify what factors will influence the decision. Begin developing, coordinating, and
executing service and site restoration plans for affected communities and resumption of government operations and services through individual, private-sector, nongovernmental, and public assistance programs. Supporting actions may include the following:

- In short-term recovery, assist other agencies to provide essential public health and safety services; restore interrupted utility and other essential services (as soon as safely possible); reestablish transportation routes; and provide food, shelter, and other essential services to those displaced by the event.
- Long-term recovery may include complete redevelopment of damaged areas. Prioritize activities to conduct damage assessments, debris removal, hazardous materials disposal, and repair of roads and other transportation facilities. Restore transportation support facilities to enable them to receive evacuees when it is safe to do so, and secure critical assets.
- Estimate the transportation-related damage to the areas to which those evacuated/sheltered-in-place/quarantined will return.
- Determine if there is, as a result or consequence of an evacuation, an outbreak of disease or any other health or medical issue that should be mitigated, and the consequent impact on transportation.
- Determine if hazardous materials spills need to be cleaned up.
- Determine if utilities co-located on transportation facilities are functioning (i.e., running water, electricity).
- Ensure evacuation/shelter-in-place/quarantine routes are clear of debris and safe for travel.
- Determine if public transit systems are operational. Identify any populations who should not be allowed to return because of medical, health, or public safety concerns.
- Verify that injured or diseased people and animals have been attended to and recovered from the area; or if not, determine how to transport them.
- Develop a strategy for how to communicate transportation-related reentry instructions to the public.
- Determine if mutual-aid reentry should be accomplished in phases.
- Transport those who did not self-evacuate/shelter-in-place/quarantine back to their place of residence or longer-term shelters if homes are uninhabitable.
- Inspect the affected area and provide transportation aid to survivors who did not evacuate, shelter-in-place, or quarantine.
- Ensure reentry plans address those people who were unable to evacuate, shelter-in-place, or quarantine themselves.
- Ensure a clear strategy exists for how, when, and where to transport those evacuated/sheltered-in-place/quarantined and how they may reach their final destinations.
- Ensure that communication with evacuees who may be scattered among shelters, families’ homes, and other areas outside of the immediate jurisdiction can be accomplished effectively.
- Coordinate with other authorities as to the start and end times of reentry operations, including the days of the week, geographic areas covered, picture identification (ID) required to reenter, security checkpoints are in place, available routes and maps, vehicle restrictions, and available services.
- Determine whether to update ITS subsystems (e.g., DMS, HAR, and 5-1-1) to provide information to individuals reentering the area.
- Assist in providing traveler services, such as fuel, food, safe water, relief, and medical care, which should be available along the highway routes as they were during the evacuation.
• Establish alternative plans for return in case the evacuation lasts for days, weeks, or possibly longer.
• Ensure that operators and passengers have picture IDs to get back to their points of origin.
• Coordinate reentry plans with other transportation and public safety officials to adequately staff reentry routes.
• Coordinate operations to identify missing persons who might not have evacuated, sheltered-in-place, or quarantined and been lost in the event or failed to return after the event, particularly children separated from their families.

RECOVER Phase 04: Conduct Emergency Repairs

Purpose. Develop an approach to infrastructure repair/replacement and decontamination.

Actions. Develop the approach to infrastructure repair/replacement and decontamination, determining what can be done quickly and what will require more time.

• Identify rebuild vs. relocate criteria. Consider infrastructure condition, e.g. planning to replace infrastructure identified as marginal or inadequate.
• Determine repair/rebuild priorities. Assess impact on network, e.g. repairable structures that restore most of the lost regional networks given high priority.
• An incident involving chemical, biological, or radiological (CBR) agents will result in significant disruption of services. Compared to more common natural disasters, CBR incidents involve unique challenges and require significant operational adjustments. Having a restoration plan vetted in advance and facility personnel trained beforehand substantially reduces the overall time for restoration and recovery.
• Identify equipment required and contractor resources. Maintain fresh list of potential specialized equipment suppliers.
• Make design decisions as soon as possible to minimize recovery time. Some decisions can be made before an event, such as what design strategies to take when rebuilding or replacing existing infrastructure.
• Major repair or replacement construction typically requires contracting for engineering and contractor services. Have a prequalified list of engineers and contractors to contact to expedite this process.
• Establish emergency contracting protocols in advance.
• Identify locations for positioning of supplies and heavy equipment.
• Identify right of way (air space/land) for staging areas.

Step 2—Identify and Implement Lessons Learned

Many of the most useful practices and recommendations presented in this and other guides have been developed by evaluating the emergency management processes of previous events to identify what could have been done better or more efficiently. These lessons learned are an essential tool for continually improving the emergency management capabilities of state transportation agencies and other response agencies. Moreover, as presented in this 2017 Guide’s discussion of the emergency planning process, emergency planning never ends; rather, it evolves as emergency planners and response teams continue to learn from new experiences. As such, following any emergency event, the agency should actively participate in developing lessons learned from the event. Identifying and implementing lessons learned requires the completion of two phases (phases 5 and 6).
RECOVER Phase 05: Perform After-Action Reviews

**Purpose.** Assess response activities to determine what went well and where improvements are needed.

**Actions.** Identify who is responsible for conducting After-Action Reviews and for ensuring necessary changes are made to EOPs, SOPs, SOGs, etc., and communicated to staff. Conduct a review of how the evacuation/shelter-in-place/quarantine was executed and determine how it could have been improved. Each agency should review its actions. When multiple agencies are involved in an operation, conduct a joint After-Action Review to address how well agencies worked together and what improvements can be made in future joint operations. Share each After-Action Review with decision makers and agency personnel and include recommendations for which improvements should be considered and implemented quickly.

Conduct an After-Action Review, a formal meeting of operation participants to assess actions, determine follow-up items, and develop recommendations for improving future operations. Include results of the After-Action Review in an After Action Report (AAR) and use results to determine if changes should be made to plans and procedures.

RECOVER Phase 06: Return to Readiness

**Purpose.** Incorporate recommendations from the After-Action Review into existing emergency response plans and procedures.

**Actions.** Establish a policy for the evacuation/shelter-in-place/quarantine team members’ home organizations regarding recovery time and time to participate in After-Action Reviews and other return-to-readiness activities. Agencies may do the following:

- Determine what equipment and supplies need to be restocked, what infrastructure needs to be repaired or replaced, and what new information needs to be communicated to the public to maintain their awareness to be prepared.
- Begin transitioning the system from an operations cycle back to a state of planning and preparedness.
- Continue data collection and begin analyses of response activities.
- Identify evacuation costs and reimbursable expenditures. Account for services such as equipment rehabilitation, restocking of expendable supplies, transportation to original storage or usage locations, overtime costs for public safety and transportation officials, materials used in support of evacuation, and contract labor and equipment.
- Begin request for reimbursement processes from state and federal governments, as applicable.
- Continue to track personnel, supplies, and equipment costs to meet the requirements of the reimbursing agencies.
- Work with FEMA and FHWA to ensure proper documentation is used for submitting reimbursement requests.
Section 5: Emergency Management Stakeholders and Regional Collaboration

Organizational, Staffing, and Position Guidance
To be ready for the agency’s role, a comprehensive emergency management program must be in place within the agency. Emergency management programs can be challenging for state DOTs and other transportation agencies, especially in terms of the coordination with other local, tribal, state, regional and federal agencies that may be involved. There is no standard, one-size-fits-all organization or staffing guide for state transportation agency emergency response planning process. Large transportation agencies may have dedicated emergency managers and staff. Small agencies do not have the resources for a full-time emergency manager and the role may be taken on by someone in the maintenance division who is an engineer or responsible for safety. In smaller cities and counties transportation is often part of the Public Works or General Services departments. As agency staffing levels shrink, functions may be contracted out to consultants or outside vendors.

This section offers an overview of emergency management roles and responsibilities with some guiding principles for state transportation agencies to consider as they establish their Emergency Management process and how an agency might position itself for effective planning, preparation, mitigation, response, and recovery.

Executive Support
As NCHRP Report 525: Surface Transportation Security, Volume 6: Guide for Emergency Transportation Operations stresses:
 Executive-level support is crucial to the development of a more formal program approach and to ensure that the responsibilities and resources are mobilized and targeted. Raising a fragmented set of responsibilities to the level of a resourced, managed program must overcome bureaucratic traditions and inertia, compete for resources, support new approaches, and forge new external relationships.

These challenges require top executive leadership—starting at the policy level in agency headquarters and executed under the responsibility of the district and regional management levels. Such executive initiative and oversight is essential to ensure:

- Fostering of an interagency focus on the complete array of incidents and emergencies;
- Establishment of a formal program with senior responsibility, organization, and reporting;
- Allocation of adequate resources;
- Establishment of objectives with related performance measures and accountability; and
- Development of agency policy, laws, regulations, and interagency agreements.

In short, emergency management is for everyone in leadership positions in the state transportation agency, not just those bearing titles alluding to emergency management responsibilities.

ESF#1 Transportation Functions
The state DOT is typically assigned to be the lead agency for ESF#1. ESF#1 Functions address the key response core capability of critical transportation and are described in the National Response Framework ESF Annexes as coordination of “the support of management of transportation systems and infrastructure, the regulation of transportation, management of the Nation’s airspace, and ensuring the safety and security of the national transportation system” (National Response Framework, FEMA 2013).


- “Monitoring and reporting status of and damage to the transportation system and infrastructure as a result of the incident
- Identifying temporary alternative transportation solutions that can be implemented when systems or infrastructure are damaged, unavailable, or overwhelmed
- Coordinating and supporting prevention, preparedness, response, recovery, and mitigation activities among transportation stakeholders within the authorities and resource limitations of ESF #1 agencies.” (2013 ESF #1 Transportation Annex)

The state EMA establishes specific ESF #1 responsibilities of the state DOT. The state DOT then develops its preparedness plans based on assigned responsibilities and state and agency needs. For instance, Tennessee DOT’s 2015 Disaster Operational Guide establishes the following scope for the DOT’s ESF #1 responsibilities during disasters:

- Ensuring major routes and alternatives are open and available for use by incoming personnel, equipment and supplies.
- Ensuring traffic control devices are in place and easily understood by emergency responders moving into an area, diverting unauthorized civilian traffic from the disaster areas, and assisting victims who are voluntarily leaving the disaster areas. This includes coordinating activities with ESF #13 Law Enforcement to provide staffed roadblocks and other control posts.
- Ensuring route conditions allow for the movement of any vehicles authorized to use a particular route.
- When safe to do so, waiving restrictions concerning weight, height, and width of vehicles, as well as provisions concerning the hauling of hazardous materials, explosives, and other sensitive materials needed in the affected areas on a case by case basis.
- Coordinating the use of vehicles carrying personnel and/or equipment to ensure maximum efficiency is utilized (i.e., vehicles are fully loaded, etc., to prevent duplication of effort, unnecessary trips, etc.)

**ESF#3 Public Works and Engineering Functions**

The state DOT may in some states become the lead or co-lead agency for ESF#3 which addresses the following key response core capabilities.

- Infrastructure systems
- Critical transportation
- Public and private services and resources
- Environmental response/health and safety
- Fatality management
- Mass care services
- Mass search and rescue operations

ESF#3 “coordinates the capabilities and resources to facilitate the delivery of services, technical assistance, engineering expertise, construction management, and other support to prepare for, respond to, and/or recover from a disaster or an incident.” (National Response Framework, FEMA 2013)

**ESF#3 Public Works and Engineering functions for state DOTs are:**
• “Provides technical expertise and assistance for repair and restoration of transportation infrastructure (e.g., highways, bridges, tunnels, transit systems, port facilities, and railways) and provides advice and assistance on the transportation of contaminated materials.
• Provides engineering personnel and support to assist in damage assessment, structural inspections, debris clearing, and restoration of the Nation’s transportation infrastructure.
• Administers special funding that can be used for repair or reconstruction of major highway facilities as well as grant programs for transit systems and railroads that could be used for repair and rehabilitation of damaged infrastructure.” (2008 ESF #3 – Public Works and Engineering Annex)

As an example, Tennessee DOT is the lead for ESF #3 Infrastructure Sub-functions, Route Clearance and Bridge Inspection Sub-function and Debris Removal Sub-function.

The Route Clearance and Bridge Inspection Sub-function...

• “provides the capability of determining route conditions based on ground and aerial observations, and providing for removal of debris from roadways and airfields to open them up for use by responding personnel”; and,
• “provides for debris removal from major roadways after roadways are opened, and from other areas as determined by the Direction and Coordination group at the SEOC.”

The Debris Removal Sub-function...

• “coordinates the removal of debris generated through the demolition of unsafe structures, recovery activities, or through the disaster itself.”

(Tennessee DOT 2015 Disaster Operational Guide)

Traffic Incident Management

State DOTs, tribal and local public works agencies along with safety/service patrols address and manage traffic incidents on a daily basis. Field personnel also perform TIM activities during emergencies and disasters. FHWA’s TIM website provides a comprehensive summary of activities involved in traffic incident management or TIM:

• Assist in incident detection and verification
• Initiate traffic management strategies on incident impacted facilities
• Protect the incident scene
• Initiate emergency medical assistance until help arrives
• Provide traffic control
• Assist motorist with disabled vehicles
• Provide motorist information
• Provide sand for absorbing small fuel and anti-freeze spills
• Provide special equipment clearing incident scenes
• Determine incident clearance and roadway repair needs
• Establish and operate alternate routes
• Coordinate clearance and repair resources
• Serve as incident commander for clearance and repair functions
• Repair transportation infrastructure
(FHWA Emergency Transportation Operations/Traffic Incident Management website https://ops.fhwa.dot.gov/eto_tim_pse/about/tim.htm#ti)

These TIM activities coincide with emergency response activities during large-scale emergencies and disasters such as damage assessment and debris removal.

**Traffic Management Centers (TMCs) and Technologies**

TMCs monitor and manage transportation systems and support incident management through the deployment of ITS and other transportation technologies such as traffic sensors, video surveillance, Road Weather Information Systems, traffic signal controls, and traveler information systems. TMCs are often co-located with EOCs and work closely with emergency response personnel from their DOT and from state and local police and fire departments to manage traffic incidents of all sizes and types. TMC personnel require training on these technologies and partnerships so that they are able to respond to and support larger-scale incidents. Specific TMC emergency support activities include:

- Plan for anticipated events (hurricanes, winter storms, etc.).
- Detect, verify, and monitor roadway conditions.
- Assess transportation system damage and capacity.
- Identify and manage public safety lifeline routes.
- Develop and implement traffic control strategies to support emergency response and evacuation.
- Manage detours and evacuation routes.
- Dispatch maintenance and support vehicles.
- Coordinate with local transportation agencies.
- Develop event-specific operational strategies to address response phases.
- Provide public information/traveler alerts.
- Stabilize traffic demand in the affected area.
- Post-event debriefings.

(2012 Role of Transportation Management Centers in Emergency Operations, FHWA Guide)

**Emergency Management Stakeholder Responsibilities**

This section contains an overview of stakeholders and stakeholders responsibilities related to emergency management. The following tables identify role and responsibilities for the following categories of stakeholders:

- Federal Agencies including the US Department of Transportation, the Department of Homeland Security, FEMA, and others. (Table 6)
- Regional Organizations including regional coalitions such as the I-95 Coalition and the Central Earthquake Consortium and regional advisory panels/planning councils such as regional and metropolitan planning agencies. (Table 7)
- State, Territorial, and Tribal Agencies including the State Transportation Agency, the State Department of Emergency Management, State Public Works, National Guard, , Emergency Operations Centers and Fusion Centers. (Table 8)
- Local Agencies including Law Enforcement agencies, Fire and Rescue, Emergency Medical Services, local utilities, and port authorities. (Table 9)
• Private Partners such as Towing and Recovery Operators, HAZMAT Contractors, Insurance Companies, and Labor Unions. (Table 10)
• Associations including Volunteer Organizations, Nongovernmental Organizations (NGOs), and Community-based Organizations (CBOs) and Associations of Cities, Counties, Sheriffs, Police, EMS, Faith-based organizations (FBOs and others). (Table 11)

• Other Organizations and People such as Technical Societies, Chambers of Commerce, and Citizens Groups. (Table 12)

Table 6. Federal Agencies

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Management Responsibilities</th>
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</thead>
<tbody>
<tr>
<td>U.S. Department of Transportation (U.S.DOT)</td>
<td>Serves as head of federal ESF#1.</td>
</tr>
<tr>
<td>Federal Highway Administration (FHWA)</td>
<td>FHWA publishes accepted practices and planning documents to demonstrate what is being done around the country, including regarding traffic incident and emergency management.</td>
</tr>
<tr>
<td>Other U.S.DOT Administrations</td>
<td>Depending on the mode, other Administrations may be stakeholders responsible for coordinating their agencies’ activities.</td>
</tr>
<tr>
<td>Department of Homeland Security (DHS)</td>
<td>DHS is responsible overall for homeland security and Emergency Management as articulated in its mission statement: “We will lead the unified national effort to secure America. We will prevent and deter terrorist attacks and protect against and respond to threats and hazards to the Nation.”</td>
</tr>
<tr>
<td>Federal Emergency Management Agency (FEMA)</td>
<td>As a major department of DHS, FEMA leads the effort to prepare the nation for all hazards and effectively manage federal response and recovery efforts following any national incident. FEMA also initiates proactive mitigation activities, trains first responders, and manages the National Flood Insurance Program and the U.S. Fire Administration. FEMA is a major provider of EM policy and financial support for emergency operations.</td>
</tr>
<tr>
<td>Transportation Security Administration (TSA)</td>
<td>TSA, a major part of DHS, is primarily responsible for the security of airports and the flying public, highways, commercial vehicle operations, and other modes.</td>
</tr>
<tr>
<td>U.S. Coast Guard</td>
<td>Lead federal agency for the Marine Transportation System (MTS). USCG Marine Transportation System Recovery Unit (MTSRU) provides a holistic coordinating approach and collective informed decisions for reopening the waterways. MTSRU are established at national, regional or district, &amp; local levels. USCG Captain of the Port provides command and control of port during emergencies.</td>
</tr>
<tr>
<td>U.S. Secret Service (USSS)</td>
<td>Lead federal agency for developing and implementing the operations plan for National Special Security Events (NSSE).</td>
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Table 7. Regional Organizations

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Emergency Management Responsibilities</th>
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</thead>
<tbody>
<tr>
<td>Regional Coalitions</td>
<td>There are many multi-state regional organizations in the nation. One example is the I-95 Corridor Coalition which provides information exchange, promotes standardization of practices, and provides training. Another example is the Central U.S. Earthquake Consortium provides support to multi-state response and recovery planning, resource acquisition; public education and awareness; promotion; mitigation, and research associated with earthquake preparedness in the Central United States. It also serves as a &quot;coordinating hub&quot; for the</td>
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region, performing the critical role of coordinating the multi-state efforts of the region.

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<tr>
<th>Stakeholder</th>
<th>Emergency Management Responsibilities</th>
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</thead>
<tbody>
<tr>
<td>Advisory Panels/Planning Councils</td>
<td>Multiple stakeholder local/state/federal government &amp; public/private sector agency organizations that are involved in pre-planning and development of incident management protocols and training exercises. They may addresses stakeholder interagency coordination &amp; communications roles, responsibilities and protocols.</td>
</tr>
<tr>
<td>State Transportation Agency or Territorial/Tribal Equivalent</td>
<td>The state transportation agency (usually a DOT) is responsible for the operations and maintenance of the highway system. It normally conducts overall planning and implementation of traffic incident management programs. In some regions they are also involved in developing, implementing, and operating traffic management centers (TMCs); providing intelligent transportation systems (ITS); as well as managing incident response patrols.</td>
</tr>
<tr>
<td>Department of Emergency Management (DEM)</td>
<td>The DEM (often called by other names) has the statutory responsibility for overall emergency management at the state level. The State DEM ensures that the state is prepared to respond to emergencies, recover from them, and mitigate their impacts. It typically operates a State Emergency Operations Center (SEOC), which is activated for Governor-declared emergencies (GDE) in response to any major hazard. A number of other state agencies take part in both developing State Emergency Operations Plans (EOPs) and helping staff the SEOC when it is activated.</td>
</tr>
<tr>
<td>State Public Works Department (DPW)</td>
<td>Public works departments primarily support efforts to provide traffic control, ensure public safety, and disseminate information to the motoring public. Responsibilities of public works departments include additional roles such as debris removal, sanitation, permitting, parking management and others.</td>
</tr>
<tr>
<td>State Patrol (SP) or Highway Patrol</td>
<td>The State Patrol is generally the state’s largest traffic law enforcement agency, except for large metropolitan police forces. SPs are typically responsible for managing the majority of incidents on all state routes. They are involved in all aspects of TIM from incident detection to clearance and in ER from response to recovery.</td>
</tr>
<tr>
<td>Department of Military (DM) or National Guard</td>
<td>The National Guard is generally called up by the governor to keep order, protect life and property, and otherwise assist in emergencies, particularly in evacuations and recovery operations. In some very serious catastrophes, the DM or National Guard may be federalized and operate under the U.S. Department of Defense.</td>
</tr>
<tr>
<td>Department of Law Enforcement (DLE)</td>
<td>DLE’s role is generally confined to criminal investigations.</td>
</tr>
<tr>
<td>Department of Environmental Protection (DEP)</td>
<td>The state DEP is the state’s lead agency for environmental management. The department administers regulatory programs and issues permits for air, water, and waste management.</td>
</tr>
<tr>
<td>Emergency Operations Center</td>
<td>EOCs are the organizations primarily charged with managing emergencies. They are typically operated at the state level (SEOC) for major disasters, as well as at the regional (usually county) level (LEOC) for more locally focused incidents or to coordinate with other EOCs for larger incidents. EOCs may be organized in a number of ways, but most tend to follow the guideline outlined</td>
</tr>
</tbody>
</table>
in the National Response Framework, namely the 15 Emergency Support Functions, or ESFs. Typically, the SEOC is only activated for a GDE. Regional EOCs may be partially or fully activated by designated local authorities, generally the board of county commissioners (for a general state of emergency), mayor or county administrator (for local emergencies), and so forth. Each EOP should make clear what the activation levels are, who is activated for each level, and who has the authority to direct the activation.

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<tr>
<th>Stakeholder</th>
<th>Emergency Management Responsibilities</th>
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<tbody>
<tr>
<td>Law Enforcement (Police and Sheriffs)</td>
<td>Generally, limited-access and state highways are part of the national transportation system and are primarily patrolled and responded to by the State Patrol; however, some limited-access routes and most state roads within local municipality city limits are the responsibility of the city police. General law enforcement TIM/ER responsibilities are</td>
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<tr>
<td></td>
<td>• Assist in incident detection;</td>
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<td>• Secure the incident scene;</td>
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<td></td>
<td>• Serve as incident commander;</td>
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<td>• Clear minor incidents quickly;</td>
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<td></td>
<td>• Assist disabled motorists;</td>
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<td></td>
<td>• Provide emergency medical assistance until help arrives;</td>
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<td>• Direct traffic through/around the incident;</td>
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<td></td>
<td>• Conduct crash investigations;</td>
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<td></td>
<td>• Maintain private towing contracts;</td>
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<td></td>
<td>• Ensure rapid response of recovery and towing contractors;</td>
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<td></td>
<td>• Safeguard personal property in all emergencies; and</td>
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<tr>
<td></td>
<td>• Promote laws, policies, practices, and public awareness campaigns to promote quick clearance and recovery.</td>
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<tr>
<td>Fire Rescue</td>
<td>Fire and rescue services are provided by local fire departments and by surrounding fire departments through mutual-aid agreements. The fire department is the primary emergency response incident command agency for fire suppression, hazardous materials spills, rescue, and extrication of trapped crash victims. Typical fire department TIM/ER responsibilities include</td>
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<td>• Protect the incident scene,</td>
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<td></td>
<td>• Serve as incident commander during fire-related stages,</td>
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<td></td>
<td>• Provide traffic control until police or state transportation agency arrival,</td>
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<td></td>
<td>• Provide emergency medical care,</td>
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<tr>
<td>Stakeholder</td>
<td>Emergency Management Responsibilities</td>
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</table>
| Towing and Recovery Operators | Towing and recovery service providers are responsible for the safe and efficient removal of wrecked or disabled vehicles and debris from the incident scene. Their typical responsibilities include:
- Remove vehicles from incident scene,
- Protect victims’ property and vehicles,
- Remove debris from the roadway, and
- Provide transportation for uninjured vehicle occupants. |

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<tr>
<th>Stakeholder</th>
<th>Emergency Medical Services (EMS)</th>
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| Emergency Medical Services (EMS) | The primary responsibility of EMS is the triage, treatment, and transport of crash victims. Private companies often provide patient transport under contract. Typical TIM/ER roles and responsibilities assumed by EMS can include:
- Provide initial HAZMAT response and containment,
- Fire suppression,
- Rescue crash victims from wrecked vehicles,
- Rescue crash victims from contaminated environments,
- Arrange transportation for the injured, and
- Assist in incident clearance and emergency recovery. |

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Medical Examiner/ Coroner</th>
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<tbody>
<tr>
<td>Medical Examiner/ Coroner</td>
<td>By law, Medical Examiners (or Coroners) are responsible for investigating deaths that result from anything other than natural causes. As such, they play an important role in investigating fatal accidents that occur on roadways and in other emergencies. They can cooperate with other responders by enabling those responders to remove deceased persons from the roadway, and even from the scene—under mutually agreeable circumstances.</td>
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<thead>
<tr>
<th>Stakeholder</th>
<th>City and County Public Works and Traffic Engineering</th>
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</thead>
<tbody>
<tr>
<td>City and County Public Works and Traffic Engineering</td>
<td>City and county transportation agencies have roles similar to the state transportation agencies, but at the local level. They are responsible for the highways not included under the state’s highway system.</td>
</tr>
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<thead>
<tr>
<th>Stakeholder</th>
<th>Transit Agencies (public or private, including school buses)</th>
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</thead>
<tbody>
<tr>
<td>Transit Agencies (public or private, including school buses)</td>
<td>Transit vehicles are a critical component for moving large groups of people to be evacuated, sheltered-in-place, or quarantined. It is important to have agreements in place to activate fleets to carry out this function. Operators need to be trained in fundamental care for disabled and transportation-disadvantaged persons.</td>
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<thead>
<tr>
<th>Stakeholder</th>
<th>Port Authorities</th>
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</thead>
<tbody>
<tr>
<td>Port Authorities</td>
<td>Organizations, who may own, lease and/or operate port cargo terminals, docks, cranes, offices and other equipment and services.</td>
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</tbody>
</table>

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<thead>
<tr>
<th>Stakeholder</th>
<th>Local Utility Companies (Electricity, gas, water, waste Management)</th>
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</thead>
<tbody>
<tr>
<td>Local Utility Companies (Electricity, gas, water, waste Management)</td>
<td>Ensures needed power, water and other services are supplied.</td>
</tr>
</tbody>
</table>
Towing and recovery companies that respond to highway incidents are indispensable components of all traffic incident management programs. Even programs that include incident response patrols with relocation capability depend on towing and recovery service providers. Challenges facing the towing and recovery industry are unique.

| HAZMAT Contractors | Hazardous materials contractors are hired by emergency or transportation authorities to clean up and dispose of toxic or hazardous materials. Their traffic incident management role and responsibilities include  
| • Determine proper/prudent method of hazardous material cleanup and disposal,  
| • Dispose of hazardous materials or provide on-site cleanup, and  
| • Participate in the unified command at HAZMAT scenes. |

| Asset Maintenance/Management Contractors | When used by the state transportation agency, these contractors serve in the same role as the agency’s maintenance forces. It is important in drafting these contracts to clearly define contractor responsibilities for ER and TIM. |

| Motor Carrier Companies | Motor carriers, particularly through their professional and trade associations, can improve awareness of good TIM practices to their drivers, such as assisting in quick clearance, which can lead to better incident management overall. |

| Insurance Companies | These insure people, vehicles, and property, but they can also promote safe practices in incident response. |

| Traffic Media | The media report on incidents, alert motorists, provide alternate route information, and provide other critical information. They are a close partner, and the relationships with incident and emergency management officials must be based on mutual trust. |

| Labor Unions | Ensuring appropriate safety, working conditions and hours of operation for represented work force. |

Table 11. Associations

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Emergency Management Responsibilities</th>
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</thead>
<tbody>
<tr>
<td>Volunteer Organizations, Nongovernmental organizations (NGOs), community-based organizations (CBOs), and Faith-based organizations (FBOs)</td>
<td>The American Red Cross and many other associations are vital partners in emergency response. Their specific role and responsibilities should be well defined in the EOPs. Voluntary Organizations Active in Disaster (VOAD) is an association of organizations that mitigate and alleviate the impact of disasters. It provides a forum promoting cooperation, communication, coordination and collaboration; and fosters more effective delivery of services to communities affected by disaster.</td>
</tr>
<tr>
<td>Automobile Associations</td>
<td>These organizations assist agencies, support TIM/EM programs, and inform motorists of good practices.</td>
</tr>
<tr>
<td>Technical Societies (e.g., State Chapters)</td>
<td>These assist agencies, support TIM/EM programs, and provide training.</td>
</tr>
<tr>
<td>Associations of Cities, Counties, Sheriffs, Police, EMS, etc.</td>
<td>These assist agencies, support programs, and provide training, but more generally involved in EM.</td>
</tr>
<tr>
<td>Chambers of Commerce</td>
<td>These could assist agencies by supporting TIM/EM programs and engaging businesses in good preparedness practices</td>
</tr>
<tr>
<td>Ground/Maritime/Intermodal Trade Associations (e.g., International Association of Emergency Managers)</td>
<td>Member organizations that support information gathering and sharing and member issues identification, training and advocacy.</td>
</tr>
</tbody>
</table>
Regional Coordination

Major events often have a regional impact. Smaller communities may be dependent on larger communities with regional infrastructure systems to recover quickly and efficiently before they can recover. Infrastructure such as bridges and rail/truck routes in neighboring jurisdictions can greatly impact the regional economy and traffic flow. Surrounding communities can become host to evacuees from impacted areas, which may require traffic management and increased infrastructure capacity. Because of this, taking a regional approach to emergency management is a recommended practice.

Regional joint planning helps efficiently identify and prepare supplementary support resources.

Planning practices used by agencies for regional emergency transportation planning include the development of checklists, timetables, and clear/easy-to-follow instructions to carry out traffic control set up and emergency routing orders. The development and coordination of plans for the management of transportation systems during post-event reentry has also been identified as an effective planning strategy. Other findings include:

- Transportation planning for emergencies was most commonly addressed in regional or state plans and annexes.
- Re-entry and recovery plans were less common regional practices.
- The survey results indicated a lack of planning for using available transportation modes in emergencies and other events. While multiple transportation modes were available in survey respondents’ regions, the percentages of those modes included in emergency plans decreased significantly.
- Regions with some type of a planning organization of were predominately represented, however, planning organizations’ participation in transportation around emergencies and planned events was not a widespread practice.
- Barriers to effective regional transportation planning for emergencies, disasters, and planned special events or events of national significance were issues related to funding, limited time and staff resources, communication between agencies and across various organizational levels, and traditional stovepipes in and between organizations.

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### Table 12. Other Organizations and People

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Emergency Management Responsibilities</th>
</tr>
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<tbody>
<tr>
<td>Citizens for Better Transportation (state-by-state)</td>
<td>These groups can assist agencies, support TIM/EM programs, and, most importantly, lobby for favorable legislation.</td>
</tr>
<tr>
<td>Citizens Groups</td>
<td>These could be useful channels for outreach, both through speaking engagements as well as programmatic undertakings by the organizations.</td>
</tr>
<tr>
<td>Individuals and Families</td>
<td>All should be encouraged to practice good preparedness, such as having generators, adequate emergency supplies and equipment; making escape and evacuation plans and arrangements for pets; stocking up on fuel and food and medicines; and identifying vital papers in advance of impending emergencies.</td>
</tr>
</tbody>
</table>

(IAEM), AASHTO, American Association of Port Authorities
Role of MPOs

**The Role of the Metropolitan Planning Organization (MPO) in Preparing for Security Incidents and Transportation System Response** focused on the role of the MPOs in regard to security incidents, both before and after the event occurs.

*Due to their function as a forum for cooperative decision making, the MPO can play an instrumental role in the coordinated planning efforts to address the threats of terrorist attacks and natural disasters.*

*The MPO has a critical role to play for three primary reasons: the MPO’s role of being capable of technically analyzing the transportation network, as a forum for cooperative decision making, and as a funder of regional transportation strategies.*

*The most basic method in which security can be incorporated into the metropolitan transportation planning process is by explicitly considering, prioritizing, and selecting transportation projects and planning studies that enhance security in the region. ...Planning studies that examine vulnerabilities of the region’s transportation system can be an effective way to enhance the region’s security as well.*

Source: The Role of The Metropolitan Planning Organization (MPO) In Preparing For Security Incidents and Transportation System Response, Michael D. Meyer, Ph.D., P.E., Georgia Institute of Technology,

The paper concluded that the MPO “… has a critical role to play” as a medium for collaboration, as a financial resource for planning, and as a resource for transportation system analysis.

MPOs can form a critical partners group or take part in existing groups focused on Emergency Management. Developing a dialog and documenting the existing regional emergency response/incident management chains of command and communication channels is necessary to identify areas for possible increased coordination and collaboration.

Examples of the role that MPOs can play a role in emergency management include:

- Acting as forum for regional assessment.
- Planning and coordinating regional evacuation routes.
- Coordinating signage and public education and information dissemination strategies with regional emphasis.
- Maintaining a database of critical transportation routes and traffic flow, infrastructure and sheltering. Cooperation with regional stakeholders is important in defining regionally significant transportation infrastructure for which data and information should be continually collected and monitored by the metropolitan planning organization.
- Coordinate all hazards training exercises and activities with neighboring jurisdictions, and state and federal agencies.
- Being a central point of distribution for planning and recovery strategies/policies.
- Establish and sustain regional emergency management partnerships.
  - Evaluate its existing Public Participation Plan (PPP) to ensure adequate input is provided for entities involved in Incident Management and Emergency Management.
Identify regionally significant entities involved in incident management and emergency management/response as it develops all of its major modal plans, as well as smaller subarea and corridor studies.

A Case Study of California MPOs is included in the Appendix B.

**Mutual Aid/Emergency Management Assistance Compact (EMAC)**

State DOTs provide and receive mutual aid to/from other states and organizations using mutual aid agreements and mutual aid plans. Mutual aid operational plans include a schedule of training and exercises for validation of plan design, concept, implementation and communications, logistics, and administrative structure, and affording practice opportunities to emergency response providers. (Draft 2017 NIMS Guideline for Mutual Aid) EMAC is an example of interstate/tribe/territory mutual aid compact, and was discussed in Section 2 of this Guide. Understanding and being able to execute tasks related to EMAC and other mutual aid agreements is important and requires appropriate training.
Section 6: Emergency Management Training and Exercises

As emphasized in Section 4, plans should be routinely tested through training, drills, and exercises. This section covers training, drills, and exercises for not only the state DOT’s emergency plans but the agency’s broader emergency management program. Also, relevant state DOT case examples of training and exercise implementation are included. In addition, this section introduces the Homeland Security Exercise and Evaluation Program (HSEEP) approach to exercise development and evaluation.

Once a plan has been developed and needed resources have been procured, personnel are organized and equipped; and training, exercises, and evaluation conducted to develop required capabilities and competencies. Per the 2015 AASHTO Fundamental Capabilities of Effective All-Hazards Infrastructure Protection, Resilience, and Emergency Management, this capability is:

- Preparing DOT employees for their roles;
- Understanding and improving plans put in place;
- Providing an opportunity to test plans and validate the effectiveness of training.

There is no question that successful management of emergencies, especially large-scale or complex ones, requires well-trained and exercised personnel who can not only perform their assigned tasks but work with personnel from other agencies and jurisdictions, and provide emergency services in other jurisdictions if requested. Emergency management training imparts to personnel knowledge, skills, and abilities required to perform their roles, responsibilities, and functions in emergencies. Individual and role-specific training leads to team- or unit-level training which culminates in interagency and interjurisdictional training and exercises that allow personnel to practice and demonstrate what they have learned, and become familiar with key personnel from and foster collaboration with other agencies and organizations. Furthermore, as noted in the 2014 NCHRP REPORT 777: A GUIDE TO REGIONAL TRANSPORTATION PLANNING FOR DISASTERS, EMERGENCIES, AND SIGNIFICANT EVENTS, regional-level disasters and emergencies have high consequences but occur infrequently or not at all. Interagency and interjurisdictional exercises are essential in testing regional plans, EOPs, and mutual aid procedures. Exercises also help assess emergency management technologies, equipment, and facilities; the ability of personnel to mobilize them; and provide personnel with the opportunities to practice using them. In addition, having good documentation and an effective and consistent training and exercise evaluation process will help DOTs fulfill grant and program requirements; and, engage in continuous improvement of plans, procedures, personnel, technologies, equipment, and facilities.

While state DOTs fully understand the importance of training for emergencies and seek to implement quality training and exercise programs, they face numerous challenges that can impede their goal. The roles and responsibilities of personnel involved in emergency management continue to evolve and expand, and new threats and hazards emerge, while budgets decrease or remain stagnant. Training managers and supervisors are also faced with new or changing federal and state transportation and emergency management legislation, standards, and guidance. To keep up with these challenges, state DOTs need to act strategically and create an emergency training and exercise program that is not only aligned with federal and state guidance but can easily integrate changes and improvements, and take advantage of available resources and partnerships. For example, FEMA and the state EMA have a wealth of knowledge and preparedness resources on exercise planning and design, conduct and evaluation, and offers emergency training and exercise opportunities at nominal or no cost to state agencies. Close
coordination with the state EMA is also important since state agencies are usually expected to support the state’s NIMS and Stafford Act compliance and reporting requirements as well as the state’s efforts towards EMAP accreditation.

Interagency training and exercises help ensure that key players are able to respond to emergencies efficiently and effectively, fulfill their roles and responsibilities in the EOP and other emergency plans, and coordinate and collaborate with each other using NIMS/ICS. Following national standards such as NIMS/ICS, HSEEP, EMAP, and EMAC and incorporating them into training and exercises enhance the ability of state DOT personnel to work with other agencies and jurisdictions. While delivering training to large numbers of field personnel is costly and adhering to national standards and undertaking corrective actions may be time consuming, the benefits of enhanced preparedness far outweigh the costs.

**Emergency Training and Exercise Needs**

Emergency training needs for state DOT personnel with emergency management roles can be determined by conducting a training needs assessment. The assessment will identify internal and external requirements and mandates, and employees’ current and potential responsibilities. The assessment results will provide the specific training required by job function or position. Personnel from M&O field personnel to supervision to CEOs and elected officials require some form of emergency training. In addition, individuals responsible for exercise planning, design and development should have appropriate training as well. Some state DOTs offer training and assistance on emergency response and recovery and the FHWA ER program to local public works agencies. As state DOTs increasingly rely on contractors to perform all types of work including emergency response and recovery work, state DOTs should ensure that those contractors selected for emergency management roles are both qualified and trained. Where appropriate and feasible, state DOTs may choose to include contractors in their training and exercise programs. In addition, some state DOTs include other emergency response providers such as police, fire and local public works agencies in their training and exercise programs. Appendix E of NCHRP SYNTHESIS 468 provides a Needs Assessment form used by Vermont VTrans to determine the training needs of their employees.

National preparedness guidance and mandates include the National Response Framework Emergency Support Function ESF# 1 and ESF# 3 and the National Incident Management System (NIMS). Key national standards include the OSHA and the MUTCD standards.

State DOT personnel with roles and responsibilities delineated in plans require training. According to CPG 101 v. 2,

> “Whenever possible, training and exercise must be conducted for each plan to ensure that current and new personnel are familiar with the priorities, goals, objectives and courses of action.” (p. 4-26, CPG 101 v. 2)

Plans include agency and state preparedness plans; joint operational or regional coordination plans; all-hazards evacuation plans; Standard Operating Procedures; mobilization plans; continuity plans; mitigation plans; recovery plans; codes and requirements; transportation/traffic incident management plans; and, hazard-specific response plans.

DHS/FEMA grants help DOTs participate in preparedness activities including training and exercises. They normally require implementation of NIMS and can also have training, exercise, evaluation, and reporting requirements.
In addition, areas of improvement identified in risk assessments, self-assessments, reviews, performance indicators, lessons learned and corrective actions of exercises, incidents, and planned events can also impact training and exercise programs.

Emergency training needs of transportation field personnel are discussed in detail in NCHRP Synthesis 468 on Interactive Training for All-Hazards Emergency Planning, Preparation, and Response for Maintenance and Operations Field Personnel. The transportation CEO’s role in emergency response is described in the NCHRP web-only document 206: Managing Catastrophic Transportation Emergencies: A Guide for Transportation Executives. According to the document, the CEO of the state DOT has the ultimate responsibility regarding the agency’s emergency management program and its preparedness and performance during emergency situations. According to NCHRP web-only document 206: Managing Catastrophic Transportation Emergencies: A Guide for Transportation Executives, the CEO must ensure the following:

1. “An agency-wide emergency operations plan that gets reviewed and updated on a regular basis.
2. A training and exercise program of annual or greater frequency that involves the state director in at least one exercise.
3. A continuity of operations plan (COOP) plan and COOP site whose capabilities are assessed on a regular basis.” (Managing Catastrophic Transportation Emergencies: A Guide for Transportation Executives, p. 7-)

In addition, training and exercise personnel should have function-specific expertise and training experience. Individuals responsible for exercise evaluation and exercise design and development should take relevant courses on the topics.

Emergency Management Accreditation Program (EMAP)

The 2016 Emergency Management Standard promulgates standards for training, exercises, evaluations, and corrective action processes. EMAP provides accreditation on its Emergency Management Standard to government emergency management programs including programs of state EMAs and state DOTs. While no DOT is currently accredited, state DOTs support their states through compliance with the EMAP standards.

The training section states that an accredited EMAP includes a formal and documented training program that includes a “training needs assessment, curriculum, course evaluations, and records of training...” and provides “the assessment, development and implementation of training for Program officials, emergency management response personnel and the public.” (2016 Emergency Management Standard, p. 11) An accredited EMAP program should have regularly scheduled training and a method and schedule for evaluation, maintenance, and program revision. Training should be based on current and potential responsibilities, and on hazards identified in EMAP Standard 4.1.1. In addition, personnel to be trained include all personnel with emergency management responsibilities including key officials. Program records should include training participant names, and types of training planned and delivered.

With respect to exercises, evaluations, and corrective actions, an accredited EMAP “regularly tests the knowledge, skills and abilities, and experience of emergency personnel as well as the plans, policies, procedures, equipment, and facilities.” (2016 Emergency Management Standard, p. 11) An accredited exercise program evaluates plans, procedures, and capabilities through various means including periodic reviews, testing, post-incident reports, lessons learned, performance evaluations, exercises, and real-
world events. The evaluation results should be documented and provided to stakeholders. An accredited exercise program also includes a process for corrective actions which prioritizes and tracks each action.

**Continuity of Operations**

Continuity of operations plans are activated when an emergency impedes the state transportation agency’s ability to carry out its essential functions. The emergency may be due to a natural disaster or manmade event resulting in the destruction of key facilities or a pandemic incapacitating a significant proportion of key personnel. Continuity of operations plans include information about essential functions, management of vital records, devolution procedures including orders of succession, delegations of authority, and movement to alternate facilities. The 2013 FEMA Continuity Guidance Circular 1 for non-federal governments specifies the following training and exercise frequency and topics for continuity capabilities and essential functions:

Annual testing should be performed for:

- Alert, notification, and activation procedures
- Recovery of essential records, critical information systems, services, and data
- Protecting and accessing essential records and information systems
- Primary and backup infrastructure systems and services
- Telework capabilities including IT infrastructure

Annual exercises should be performed for:

- Essential functions capabilities
- Internal and external interdependencies identified in the continuity plan
- Continuity plans and procedures including internal and external communications, deliberate and preplanned movements to an alternate site, required backup records and data to support essential functions, and use of telework sites if telework is a part of the continuity plan.

Annual briefings on continuity awareness for all personnel should be conducted. In addition, annual briefings on continuity and devolution should be provided to Emergency Response Group and Devolution Emergency Response Group members. Periodic briefings should be held for managers about essential records.

Quarterly testing of internal and external communications equipment and systems, and annual testing and exercises of physical security capabilities at continuity facilities should be conducted.

Biennial exercises should be performed for reconstitution and devolution procedures.

The following annual training for Emergency Response Group and Devolution Emergency Response Group members should also be conducted:

- Reconstitution plans and procedures
- Activation of continuity plans
- Communications and IT systems
- Devolution option
• Electronic and hardcopy documents, references, records, info systems, data management software and equipment.

In addition, annual training on essential functions and roles and responsibilities should be provided to:

• Leadership staff
• Staff expected to telework during an activation
• Staff who will assume the position of organization head or other key positions
• Officials who will have policy and decision-making authorities

NIMS / ICS

NIMS is the essential foundation of the National Preparedness System and provides the template for the management of incidents and operations in support of all five National Planning Frameworks. The 2011 NIMS Training Program document emphasizes the importance of training and states that training of emergency personnel “is critical to the success of NIMS implementation nationally.” (FEMA 2011, p. 2)

Responsibilities of stakeholders including state transportation agencies include identifying appropriate personnel to take NIMS training, ensuring all course delivery meets the standard contained within the NIMS Training Program and other training guidance provided by the National Integration Center (NIC), and credentialing emergency/incident management personnel. Credentialing is defined in the 2017 draft NIMS Guideline for the National Qualification System as “the process of providing documentation that identifies personnel and verifies their qualifications for particular positions.”

These responsibilities align and dovetail with the concepts of personnel qualification and certification defined in the 2017 draft NIMS Guideline. Qualification is “the process of enabling personnel to perform the duties of specific positions and documenting their demonstration of the capabilities that those positions require.” (NIMS, 2017) Qualification involves completions of training, obtaining licenses and certifications and meeting fitness requirements. Certification attests “that individuals meet qualifications for key incident functions and are competent to fill specific positions.” (NIMS, 2017)

For state DOTs, NIMS and ICS training should be a priority for the following reasons as well: NIMS and ICS enhance the effectiveness of interagency coordination and response through a standardized approach to incident management. Implementation of NIMS is a requirement of federal preparedness grants and mitigation grants. Also, NIMS requires the use of ICS at traffic incident management scenes. Furthermore, as stated in NCHRP Synthesis 472,

“A good understanding and implementation of NIMS concepts and principles, including ICS, NIMS resource management procedures, and ICS record-keeping procedures and forms, facilitate successful integration of state DOT personnel into their state’s emergency organization and effective reimbursements.” (NCHRP Synthesis 472, p. 48)

The NIC provides NIMS training and qualification guidance and maintains and distributes foundational documents and other resources. The NIC identified core competencies for personnel qualification and a NIMS national curriculum, and for the Multi-Agency Coordination Systems. The 2011 NIMS Training Program, released in 2011 and supersedes the 2008 Five-Year NIMS Training Plan, is based on these core competencies which, in turn, are based on operational needs. The NIMS Training Program includes a NIMS Core Curriculum which includes baseline NIMS and ICS courses IS-700 and ICS-100 and additional training
including MACs, EOCs, mutual aid, and resource management. In general, incident complexity will affect training needs, and some flexibility is provided to entities in the implementation of NIMS training. For instance, agencies may develop their own training courses to suit their scheduling and budgetary needs and still meet the NIMS training requirements.

While field personnel require basic NIMS and ICS training, personnel in EOCs, MACs and TMCs, supervisors, senior management, and elected officials require additional or other training. Arizona DOT’s Emergency Planning and Management Training Matrix shows required emergency management and security training for DOT personnel by job category. The Matrix is included in Appendix G of NCHRP Synthesis 468. Missouri DOT’s NIMS Training Guide recommends specific NIMS training courses for personnel at different levels including Emergency Responders, First-Line Response Supervisors, Mid-Level Response Supervisors, Senior-Level Response Managers and Executives, Elected and Appointed Officials and Support Staff.

In addition, NIMS/ICS should be used in all training and exercises including use of ICS in exercise planning team structures; and, ICS should be used in emergency response including response to traffic incidents.

Five new NIMS documents were recently released for public comment. They include: NIMS Guideline for the National Qualification System, NIMS Job Titles/Position Qualifications, NIMS Position Task Books, NIMS GUIDELINE FOR THE CREDENTIALING OF PERSONNEL AND NIMS GUIDELINE FOR MUTUAL AID. Since 2010, NIMS updates and publications including the five recently released NIMS documents provide new definitions, policy direction and guidance. Existing training programs and content should be reviewed against the finalized documents and updated as needed. Also, check with your state NIMS coordinator and/or state EMA regarding NIMS compliance matters.

**Mutual Aid/Emergency Management Assistance Compact (EMAC)**

State DOTs provide and receive mutual aid to/from other states and organizations using mutual aid agreements and mutual aid plans. Mutual aid operational plans include a schedule of training and exercises for validation of plan design, concept, implementation and communications, logistics, and administrative structure, and affording practice opportunities to emergency response providers. (Draft 2017 NIMS Guideline for Mutual Aid) EMAC is an example of interstate/tribe/territory mutual aid compact, and was discussed in Section 2 of this Guide. Understanding and being able to execute tasks related to EMAC and other mutual aid agreements is important and requires appropriate training.

**Emergency Management Performance Grant (EMPG)**

EMPG funded activities include updating emergency plans, conducting training, and designing and conducting exercises to validate core capabilities, maintain current capabilities, and enhance capability for high-priority core capabilities with low capability levels. EMPG recipients and subrecipients are expected to address capability targets and gaps identified through the annual THIRA and SPR process. EMPG program recipients are also required to develop a Multiyear Training and Exercise Plan (TEP) addressing THIRA risks and exercising/validating THIRA capability requirements in a progressive manner.

Recipients should develop and maintain a progressive exercise program and a multiyear TEP consistent with HSEEP. EMPG Program funds related to training should support NIMS implementation and emphasize NIMS Training Program core competencies. NIMS Training - Independent Study (IS) 100, IS 200, IS 700, and IS 800 are required for EMPG-funded personnel. In addition, they are required to complete either
the courses in the Professional Development Series or the National Emergency Management Basic Academy.

EMPG also has the following exercise participation requirements:

- No less than four quarterly exercises of any type and one full-scale exercise within a 12-month period are required. The exercises should increase in complexity and have common program priorities.
- EMPG-funded personnel are required to participate in no fewer than three exercises in a 12-month period. For allowable costs and other information, see DHS Notice of Funding Opportunity Fiscal Year 2016 Emergency Management Performance Grant Program (EMPG)

Federal Emergency Management Agency (FEMA) Training

FEMA’s Emergency Management Institute offers complimentary, on-demand courses accessible to the public via the internet. FEMA suggests the completion of at least the following independent study courses (http://training.fema.gov/IS/):

- IS-1: Emergency Manager: An Orientation to the Position
- IS-10: Animals in Disaster, Module A – Awareness and Preparedness
- IS-11: Animals in Disaster, Module B – Community Planning
- IS-100.a: Introduction to Incident Command System
- IS-120.a: An Introduction to Exercises
- IS-130: Exercise Evaluation and Improvement Planning
- IS-200.a: ICS for Single Resources and Initial Action Incidents
- IS-208.a: State Disaster Management
- IS-235: Emergency Planning
- IS-288: The Role of Voluntary Agencies in Emergency Management
- IS-366: Planning for the Needs of Children in Disasters
- IS-547.a: Introduction to Continuity of Operations
- IS-650.a: Building Partnerships with Tribal Governments
- IS-700.a: NIMS – An Introduction
- IS-701.a: NIMS Multiagency Coordination Systems
- IS-702.a: NIMS Public Information Systems
- IS-703.a: NIMS Resource Management
- IS-704: NIMS Communications and Information Management
- IS-706: NIMS Intrastate Mutual Aid – An Introduction
- IS-800.b: National Response Framework, An Introduction
- IS-860.a: National Infrastructure Protection Plan

FEMA’s Emergency Management Institute offers classes in All-Hazards Position Specific Training Program annually as well. The courses are for personnel with responsibilities for managing complex incidents and are seeking certification for ICS command, general staff, or unit leader positions or current members of an Incident Management Team.
Federal Reimbursement Programs (e.g., FHWA ER, FEMA PA)

Federal reimbursement programs such as the FHWA Emergency Relief and the FEMA Public Assistance programs have complex processes and procedures. Fully understanding the program requirements can save DOTs time and expenses and help them receive the reimbursement amounts to which they are entitled. In addition to documentation, damage assessment, and debris management, knowledge of emergency contracting, repair versus replacement considerations, design and mitigation techniques, environmental and historical preservation regulations, and construction and procurement procedures are required. Each of these function areas have detailed requirements and can become confusing during an emergency.

As stated in the NCHRP Synthesis 472: FEMA and FHWA Emergency Relief Funds Reimbursements to State Departments of Transportation a “high level of preparedness leads to better outcomes [with respect to the FEMA and FHWA reimbursement programs] for state DOTs.” Training practices that were helpful to DOTs in obtaining successful reimbursements included providing training on the FHWA Emergency Relief and FEMA Public Assistance programs to personnel responsible for documentation and reimbursement, training in conducting assessments, using scenarios from prior disasters, providing training to Local Public Agencies on both programs, providing training to state EMA personnel on the FHWA Emergency Relief program, and training state DOT personnel for integration into the state EMA as FEMA project officers and project coordinators. Transit agencies should also achieve full understanding of FTA’s Emergency Relief program and comply by its requirements.

Emergency Evacuations

Exercises can assess the feasibility of an evacuation plan and train personnel. State transportation agencies conduct and/or participate in exercises in areas with high likelihood of hurricanes and flooding to prepare for an evacuation. As described in the NCHRP 20-59(30) Texas DOT case study, after Rita, DHS conducted a series of hurricane preparedness exercises in the Gulf Coast region to prepare for the 2006 hurricane season.

Contraflow has been used by hurricane-prone areas for emergency evacuations. Contraflow is described as “a form of reversible traffic operation in which one or more travel lanes of a divided highway are used for the movement of traffic in the opposing direction.” (NCHRP Report 740) Exercise results along with results of simulations and traffic analyses are used to fine tune contraflow operations plans.

Traffic Control and Management

Traffic control during emergencies requires traffic management teams able to manage and direct traffic on highways and critical intersections lacking active signalization and during contraflow operations. The Manual on Uniform Traffic Control Devices (MUTCD), Traffic Incident Management (TIM), work zone safety practices, and TMCs and ITS technologies are important elements in effective traffic control and management. Hazmat protocols and OSHA guidance may be helpful in incident involving HazMat and other incident types as well.

Manual on Uniform Traffic Control Devices (MUTCD)

The FHWA’s MUTCD (available at http://mutcd.fhwa.dot.gov/ser-pubs.htm) is a national standard on traffic control devices on all roadways and bikeways open to public traffic. MUTCD also contains standards on temporary traffic control (TTC) and traffic incident management activities. TTC functions include the movement of road users around an incident, reducing the likelihood of secondary traffic crashes, and
precluding unnecessary use of local roadways. Non-compliance with the MUTCD can result in the loss of federal-aid funds and tort liability. Because the MUTCD is detailed and comprehensive, sufficient training in the standard is required of emergency response providers. In particular, responders should be trained in safe practices around traffic incident management areas to ensure their safety and the safety of motorists. The ITE Traffic Engineering Handbook recommends periodic training updates to train personnel on new MUTCD policies or standards, industry practices, or DOT policies and procedures.

The MUTCD is published by FHWA under 23 Code of Federal Regulations (CFR), Part 655, Subpart F. The following parts are applicable during emergency traffic management:

- Part 4 - Highway Traffic Signals
- Part 5 - Traffic Control Devices for Low-Volume Roads
- Part 6 - Temporary Traffic Control
- Part 7 - Traffic Control for School Areas
- Part 8 - Traffic Control for Railroad and Light Rail Transit Grade Crossings
- Part 9 - Traffic Control for Bicycle Facilities

Traffic incidents are classified into the following three classes of duration for the purpose of determining traffic control needs. These classes are:

- Major—expected duration > 2 hours;
- Intermediate—expected duration 30 minutes-2 hours;
- Minor—expected duration < 30 minutes.

In addition to the FHWA’s MUTCD webpage, MUTCD Training and Resources are also available from a number of organizations:

- Local Technical Assistance Program (LTAP) Offices
- American Traffic Safety Services Association (ATSSA)
- Institute of Transportation Engineers (ITE)
- American Association of State Highways and Transportation Officials (AASHTO)
- National Highway Institute (NHI)
- International Municipal Signal Association (IMSA)
- National Work Zone Safety Information Clearinghouse

**Traffic Incident Management (TIM) Training**

State DOTs, tribal and local public works agencies along with safety/service patrols address and manage traffic incidents on a daily basis. Field personnel also perform TIM activities during emergencies and disasters. The TIM Self-Assessment inquires whether the agency held at least one multi-agency training session on the following topics:

- NIMS/ICS 100
- Training of mid-level managers on the National Unified Goal
- Traffic control
- Work zone safety
- Safe parking
Also included is a question on whether all responders have been trained in traffic control following MUTCD guidelines.

After the introduction of NIMS, NIMS concepts and elements were incorporated into TIM. The NTIMC National Unified Goal Strategy concerning Multidisciplinary NIMS and TIM Training “ensures that incident responders are cross-trained on scene roles and responsibilities and have a thorough understanding of the Incident Command System (ICS) as required in the National Incident Management System (NIMS).” (page 5 - 2010 Traffic Incident Management Handbook Update) Furthermore, the 2010 Traffic Incident Management Handbook Update states that TIM programs “at all stages of development can and should tap into NIMS resources to achieve “Preparedness.” This integration of NIMS into TIM practices provides field personnel with frequent on-the-job training of NIMS through the response to actual incidents.

Traffic Management Centers (TMCs) and Technologies
Because TMCs play an important role in traffic and incident management and emergency support, TMC staff should be appropriately trained. TMCs should conduct task-specific needs assessment and crosscutting needs assessment. These assessments may result in the identification of specific response scenarios, and development of interagency training programs and exercises. According to the FHWA, two training related strategic actions that should be taken by TMCs focus on training and discussion-based exercises to train personnel on plans and procedures, and the certification of required personnel and equipment to ensure their preparedness.

TMCs monitor and manage transportation systems and support incident management through the deployment of ITS and other transportation technologies. TMCs are often co-located with EOCs and work closely with emergency response personnel from their DOT, from state and local police and fire departments, and other state, local, regional agencies, private contractors, towing companies and other organizations to manage traffic incidents of all sizes and types.

Work Zone Safety and Mobility Rule
The Work Zone Safety and Mobility Rule which went into effect in 2007 requires training as well as periodic refresher training for all personnel in work zone transportation management and traffic control. Note that the Rule requires Transportation Management Plans (TMPs) for all federal-aid projects and recommends TMPs for non-federal-aid projects as well. For significant projects, TMPs must have a Temporary Traffic Control (TTC) Plan and address Traffic Operations and Public Information and Outreach.

The National Work Zone Safety Information Clearinghouse (www.workzonesafety.org) supplies information on relevant training. Other sources include the National Highway Institute and professional organizations such as the ITE, the American Traffic Safety Services Association, and the International Municipal Signal Association.

The 2013 FHWA Work Zone Operations Best Practices Guidebook describes best practices by state DOTs such as a TMP peer review process by Michigan DOT, New Jersey DOT’s Safety Program (including emergency plans and training) specification as a contractor requirement and its on-site Traffic Control Coordinator (TCC) training, and Virginia DOT’s Flagger Certification Program.

Occupational Safety and Health Administration (OSHA)

As described on its website (www.osha.gov), the Occupational Safety and Health Act of 1970 created the Occupational Safety and Health Administration (OSHA) “to assure safe and healthful working conditions
for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance.” While not all DOTs are required to follow OSHA regulations, OSHA has a comprehensive set of useful standards covering workplace hazards. The OSHA standards address many workplace hazards and hazard communication including working with hazardous materials, personal protective equipment, fire protection, and fall protection; construction, maintenance and other roadway activities; bloodborne pathogens and emergency response. Various training resources including the Hazardous Waste Operations and Emergency Response training can be found on the OSHA website. For specific OSHA guidance, consult your compliance unit.

Hazmat
Workers handling or transporting hazmat require specialized training, while all field personnel would benefit from basic awareness and communications training. A useful resource is the 2011 HMCRP Report, A Guide for Assessing Community Emergency Response Needs and Capabilities for Hazardous Materials Releases.

Disclaimer: Complex federal environmental, safety, and health regulations including OSHA regulations need to be followed by state transportation agencies. For specific guidance, consult your compliance unit.

Physical Security and Cybersecurity
The 2013 National Infrastructure Protection Plan (NIPP) calls for the strengthening of Critical Infrastructure Security and Resilience through the coordinated development and delivery of technical assistance, training, and education. Another of NIPP’s goals is promoting “learning and adaptation during and after exercises and incidents.” The 2013 NIPP also encourages broad participation in exercises to address diverse needs and purposes, and addressing “cascading effects involving the lifeline functions” and determination of infrastructure priorities during response and recovery. (p. 24, 2013 NIPP)

Physical security and cybersecurity training issues will be covered in the NCHRP 20-59 51A project which is expected to result in an updated Security 101 guide.

Planned Events
Planned Events present good opportunities to assess plans and provide personnel with additional opportunity to practice their training. As described in NCHRP Report 777, WMATA evaluates the movement of drivers and riders during the annual Fourth of July fireworks on the national mall Washington, D.C. Also, large-scale planned events (e.g., Superbowl, Presidential Inaugurations) require substantial preparation including training and exercises and require the participation of many agencies including DOTs and jurisdictions.

Technologies
Effective mobilization of technologies and equipment used in emergencies is important in emergency response. They should therefore be incorporated into exercises when possible. All technologies to be used in emergency situations should be used in daily operations as well to ensure that personnel are able to use them. If a technology is complex, appropriate training should be provided prior to use. In addition, if a technology cannot be used in daily operations, personnel should receive appropriate training and the opportunity to use it in exercises.

Hazard-Specific Training
Since likely hazards and threats vary by state and region, specific state DOT training and exercise needs will depend on the likelihood of particular hazards and threats in the state or region. For instance coastal
regions are adversely affected by hurricanes while regions with nuclear power plants need radiological response plans.

**Exercises**

Training alone is not sufficient to achieve qualification in emergency management functions. Experience and practice through exercises and actual events or incidents are essential. Exercises are beneficial for multiple purposes including the evaluation of personnel, plans, procedures, equipment, and facilities. NIPP 2013 emphasizes “continuous learning and adaptation” through a call to action to learn and adapt during and after exercises and incidents, and rapidly incorporating lessons learned into technical assistance, training, and education programs.

Drills are a common form of exercise for state DOT field personnel and are used to provide training on specialized equipment or a specific function or procedure. Tennessee DOT’s Comprehensive Exercise Program document lists ten purposes for the program.

1) Exercise the Transportation Emergency Preparedness Plan, supporting plans, catastrophic annexes and specific policies and procedures to ensure TDOT’s ability to respond effectively to the needs of the citizens and local jurisdictions during emergencies,

2) Exercise the Emergency Support Functions assigned to TDOT under the Tennessee Emergency Management Plan to respond effectively to the needs of the citizens and local jurisdictions during emergencies there by improving individual and team performance, strengthening professional relationships, retaining skills, abilities, experiences and practicing or clarifying response organization roles and responsibilities,

3) Institutionalize and document the TDOT emergency management exercise program and its principles to regularly test or practice the skills, abilities, and experiences within the community of emergency management for the State of Tennessee. The CEP will also validate or test the capabilities of TDOT policies, plans, procedures, organization, equipment, facilities, personnel, training and agreements for the response and recovery phases that will allow for the return of TDOT and the transportation infrastructure system to a normal status as soon as possible; and to establish exercise program processes, practices, goals and objectives for TDOT emergency management stakeholders across the State.

4) Follow the State and agency policy and plan review cycle in order to validate the new or updated documents.

5) Establish a documented corrective action process / plan (CAP) and improvement plan (IP) that will ensure constant improvement in emergency response capabilities in TDOT.

6) To comply with TEMA and Federal homeland security requirements and known emergency management best practices.

7) To exercise response operations and planning efforts according to contractual obligations.

8) To exercise emergency response operational plans for all PROBABLE and the more likely POSSIBLE hazards and threats to Tennessee.
9) To exercise the capabilities and legal guidelines to provide the service, assistance, coordination, and expertise to the citizens of Tennessee as described by the TEMP; and

10) To support local jurisdictional training and exercise programs as best as is possible.

The 2013 Homeland Security Exercise and Evaluation Program (HSEEP) offers substantial exercise planning guidance. Many preparedness and homeland security programs require exercises and the development of After Action Reports/Improvement Plans conforming to the HSEEP. The HSEEP document provides a set of guiding principles and a common approach to exercise program management, design and development, conduct, evaluation, and improvement planning. Designed to be flexible and adaptable, HSEEP is applicable for exercises of all types.

The fundamental principles of HSEEP include a focus on capability-based objectives and exercise priorities informed by risk, guidance of the exercise program and individual exercises by elected and appointed officials, integration of the whole community where appropriate, and use of common methodology. HSEEP principles also include a progressive planning approach with exercises temporally increasing in complexity, and alignment of exercises using a common set of priorities and objectives.

In addition, HSEEP emphasizes the development of a Multi-year Training and Exercise Plan (TEP) to schedule and coordinate the delivery of training and exercise activities. The TEP takes a progressive approach with exercises and training becoming increasingly complex while adhering to the exercise program priorities. The training is designed to prepare participants for future exercises. Examples of Multiyear Training and Exercise Plans are included in the Caltrans and Tennessee DOT case studies.

Close coordination with the state Emergency Management Agency (EMA) ensures that DOT exercise and training activities support state priorities as well as DOT priorities. Regional or district offices should coordinate with regional EMA offices which can offer various types of assistance with exercise planning and implementation. DOTs can also leverage limited resources by participating in exercises or training sponsored by EMA or other agencies including local law enforcement and fire departments.

The TEP results from a Training and Exercise Planning Workshop (TEPW). The TEPW determines the strategy and format of an exercise program and program priorities based on input from elected and appointed officials. TEPW participants should include:

- Elected and appointed officials
- Representatives from relevant disciplines (federal, state, regional, local)
- Personnel responsible for exercise management and conduct including facilitators, controllers, and evaluators

CPG 101 v. 2 emphasizes the importance of considering the whole community including special needs populations and the private sector in the planning process and in exercises.

Priorities are based on jurisdiction-specific threats and hazards which may be based on THIRA and other risk assessments, corrective actions from actual events and exercises, external requirements (noted earlier in this Chapter), and accreditation standards (e.g., EMAP), regulations and legislative requirements (e.g., OSHA, MUTCD, NRC).
Once the program is underway, a rolling summary of outcomes provides an analysis of trends to inform elected and appointed officials, support reporting requirements, and modify exercise schedule and objectives as appropriate.

**Exercise Cycle**
The HSEEP Exercise Cycle contains the following four elements: 1) exercise design and development, 2) conduct, 3) evaluation, and 4) improvement planning. Key activities in each element are listed below:

1. Exercise design and development – identify exercise planning team; assign team members to schedule meetings, identify/develop objectives, design the scenario, create documentation, plan exercise conduct and evaluation, and coordinate logistics. Seek input from elected and appointed officials.
2. Conduct – prepare for exercise play, manage the exercise, and wrap-up activities.
3. Evaluation – planning for evaluation begins at the start of the exercise cycle. Performance of personnel, plans, procedures, equipment, and facilities (per 2016 EMAP) is evaluated against exercise objectives, and strengths and weaknesses are identified during the evaluation process.
4. Improvement planning – corrective actions are tracked to completion. The 2016 EMAP requires that the corrective actions are prioritized as well. The 2016 EMAP also requires that the products of evaluations of not just exercises but periodic reviews, testing, post-incident reports, real-world events, and post-incident reports be documented and distributed.

**Exercise Types**
There are two categories of exercises: Discussion-based and Operations-based.

*Discussion-based exercises* - seminars, workshops, tabletop exercises (TTXs), and games – are less costly and time-consuming than Operations-based exercises. Discussion-based exercises use a facilitator to direct discussions. They help familiarize and/or train participants on or develop plans policies, agreements and procedures such as development of operational concepts and procedures, transportation EOPs, public information dissemination strategies, and coordination of response/evacuation plans. Discussion-based exercises can also help in the creation of training.

*Operations-based exercises* – drills, FEs, and FSEs – are more realistic and conducted in real-time. Operations-based exercises provide personnel with the opportunity to practice what they have learned and are useful for assessing emergency plans, procedures, personnel, technologies, and equipment. Note that FSEs are considered having the highest realism and require the most resources and time in both exercise duration and planning.

Table 13 contains brief descriptions of each exercise type, and Table14 provides advantages and disadvantages by exercise type.

**Table 13: Discussion-based Exercises and Operations-based Exercises**

<table>
<thead>
<tr>
<th>Discussion-based Exercises</th>
<th>Operations-based Exercises</th>
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<tbody>
<tr>
<td>Seminars</td>
<td>Seminars provide an overview of authorities, strategies, plans, policies, procedures, protocols, resources, concepts, and ideas. They help to: - develop or change plans or procedures; - assess the capabilities of interagency or inter-jurisdictional operations.</td>
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<td>---------------------------------</td>
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<tr>
<td>Workshops</td>
<td>Similar to Seminars, but participant interaction is increased, and the focus is placed on achieving or building a product. Successful workshops clearly define objectives and have the broadest possible stakeholder attendance.</td>
</tr>
<tr>
<td>Tabletop Exercises (TTXs)</td>
<td>Held in an informal setting, generates discussion of various issues regarding a hypothetical emergency. TTXs are used to: - enhance general awareness, validate plans and procedures, rehearse concepts, and/or assess the systems to guide the prevention of, protection from, mitigation of, response to, and recovery from a defined incident.</td>
</tr>
<tr>
<td>Games</td>
<td>Simulates operations in a competition to - explore the consequences of player decisions and actions - helps validate or reinforce plans and procedures or evaluate resource requirements.</td>
</tr>
<tr>
<td>Operations-based Exercises</td>
<td></td>
</tr>
<tr>
<td>Drills</td>
<td>A coordinated, supervised activity to: - validate a specific operation or function in a single agency or organization; - train on new equipment; develop or validate new policies or procedures; or practice and maintain current skills.</td>
</tr>
<tr>
<td>Functional Exercises (FEs)</td>
<td>Uses exercise scenario with event updates that drive activity at the management level, conducted in a realistic, real-time environment to validate and evaluate: - capabilities, multiple functions and/or sub-functions, or interdependent groups of functions - plans, policies, procedures, and staff members in management, direction, command, and control function Actual movement of people and equipment may not occur.</td>
</tr>
<tr>
<td>Full-Scale Exercises (FSEs)</td>
<td>The most complex and resource-intensive type of</td>
</tr>
</tbody>
</table>
Exercise, involves multiple agencies, organizations, and jurisdictions. FSEs validate many facets of preparedness.

(Derived from HSEEP Glossary, 2013)

Table 14: Advantages and Disadvantages

<table>
<thead>
<tr>
<th>Discussion-based Exercises</th>
<th>Disadvantages</th>
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<tbody>
<tr>
<td><strong>Advantages</strong></td>
<td><strong>Disadvantages</strong></td>
</tr>
<tr>
<td>- Conducted in a safe, non-stressful environment at a lower cost than Operations-based exercises. Interaction among peers fosters learning. - Can assist in the identification of additional training needs. - May be helpful in developing future training content and scenarios.</td>
<td>- Cost may become an issue if the exercise is held at a location difficult to access for some or all of the participants. - Discussion-based exercises do not provide the realism that operations-based methods can provide.</td>
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<tr>
<th>Operations-based Exercises, Drills</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advantages</strong></td>
<td><strong>Disadvantages</strong></td>
</tr>
<tr>
<td>- Provide hands-on experiential learning with respect to functions, activity, or equipment. - Provides a sense of urgency without the possibility of serious consequences. - Can help identify procedural and policy gaps. - May avoid comprehension problems related to literacy/language deficiencies</td>
<td>- Providing hands-on training to a large number of individuals can be time-consuming and costly. - Scheduling drills can be difficult due to scheduling issues of the field personnel, the instructor, and the facility or equipment. - Variables differ based on the individual, so consistent outcomes are not assured. - Personality differences between the instructor or mentor and the worker may cause issues.</td>
</tr>
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<tr>
<th>Operations-based Exercises, Functional Exercises (FEs)</th>
<th>Disadvantages</th>
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</thead>
<tbody>
<tr>
<td><strong>Advantages</strong></td>
<td><strong>Disadvantages</strong></td>
</tr>
<tr>
<td>- Offers experiential learning in a realistic setting. - Facilitates the retention of knowledge and skills. - Helps identify units and individuals that would benefit from additional training. - Can help develop future training content and scenarios.</td>
<td>- Arranging and scheduling FEs can be difficult and time-consuming.</td>
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<table>
<thead>
<tr>
<th>Operations-based Exercises, Full-Scale Exercises (FSEs)</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advantages</strong></td>
<td><strong>Disadvantages</strong></td>
</tr>
<tr>
<td>- Offers very high realism, complex situations. - Helps identify units and individuals that would benefit from additional training. - Can help develop future training content and Scenarios.</td>
<td>- Significant coordination, preparation, resources, and time are required.</td>
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(Adapted from NCHRP Synthesis 468)
Emergency Response Drills

According to 2013 NCHRP Report 740, there are four types of emergency response drills useful for assessment of emergency evacuation plans:

- Plan walk-through: introduces the emergency plan, procedures, communications pathways, etc.; yields ideas, comments on plans and can also be used as refresher training;

- Table-to exercises (TTX) requiring participants to respond to a hypothetical crisis; duration of play can reach several hours;

- Event simulations which provide enhanced realism (e.g., using victims with fake blood, using actual members of special populations); duration ranges from two to eight hours;

- A full deployment drill, extremely realistic and involves multiple agencies and jurisdictions; this type of drill can last several days.

Facilitated Exercise

2010 MTI Emergency Management Training and Exercises for Transportation Agency Operations describes another type of exercise, the Facilitated Exercise. The San Jose Metropolitan Medical Task Force exercise chair created a format that divided a full-scale exercise into segments and incorporated refresher training. The facilitator guides the exercise play in each segment and ensures that no significant mistake has been made by the players. For example, if an important topic is left out of the Incident Action Plan, the facilitator will inform the players regarding its significance and will ensure that it is included in the Plan. The thinking behind this is based on adult andragogy – learners remember what they do and not what they hear. Therefore, instead of allowing players to engage in incorrect behaviors or make the wrong decisions, the facilitator takes steps to direct the exercise play in the appropriate direction.

Refresher Training

Refresher training for NIMS/ICS courses is not available through FEMA EMI and is very limited in available through other sources. Tennessee DOT, however, does provide a four-hour refresher NIMS/ICS course every five years. (NCHRP Synthesis 468) In addition, exercises and real-life incidents provide personnel with opportunities to practice NIMS and ICS.

Sandboxes

Sandboxes can help participants envision actions and facilitate operations-based exercises by simulating certain actions and scenes. The sandbox can include model vehicles, buildings, traffic signals, etc. (2014 MTI Exercise Handbook)

Helpful Tips regarding Exercise Programs

(Based on the Tennessee DOT case study)

- Establish relationships with members of state, local, and federal government emergency management communities, volunteer agencies, and private industry
- Build on existing relationships through regional personnel with key stakeholders
- Emphasize joint state and local exercises
• Design shorter duration exercises
• Consolidate exercise objectives and requirements to enhance efficiency

Design and Development
The 2013 NIPP recommends the following regarding exercise design: “Design exercises to reflect lessons learned and test corrective actions from previous exercises and incidents, address both physical and cyber threats and vulnerabilities, and evaluate the transition from steady state to incident response and recovery efforts.” (p. 26, 2013 NIPP)

For design and development of individual exercises, exercise program managers will need to manage multiple elements including the exercise budget and staff along with IT requirements, exercise tools and resources, MOUs and other agreements, technical assistance, equipment and supplies, and documentation from previous exercises.

Design and Development Steps
Exercise design and development steps include:

1. Review elected and appointed officials’ guidance, the TEP, and other factors.
2. Select participants for an exercise planning team and developing an exercise planning timeline with milestones.
3. Select objectives and core capabilities.
4. Identify evaluation requirements.
5. Develop the exercise scenario.
6. Create documentation
7. Coordinate logistics
8. Plan for exercise control and evaluation.

Key Meetings
The following meetings are usually held to help move the design and development process forward. Of these meetings, the HSEEP notes that the following are considered essential meetings: Initial Planning Meeting (IPM) and Final Planning Meeting (FPM)

Prior to these meetings, it is helpful to have identified the lead agency, funding sources, any labor restrictions, and HSEEP compliance issues. (2014 MTI Exercise Handbook).

• Concept and Objectives (C&O) Meeting - identifies the scope and objectives of the exercise. Participants include elected and appointed officials, representatives from the sponsoring and participating organizations, and the exercise planning team leader. The Concept and Objectives (C&O) Meeting can be held with the Initial Planning Meeting (IPM).
• Initial Planning Meeting (IPM) - determines exercise scope and identifies exercise design requirements and conditions such as assumptions and artificialities. Exercise documentation responsibilities and exercise details are determined; they include exercise objectives, location, schedule, duration, participant extent of play, and scenario variables (e.g., time, location, hazard selection).
• **Master Scenario Events List (MSEL) Meeting** – focuses on developing the MSEL. The meeting may be combined with the MPM or FPM.

• **Midterm Planning Meetings (MPMs)** – provides opportunities to discuss exercise organization and staffing concepts, scenario and timeline development, scheduling, logistics, administrative requirements and review draft documentation, and any other issues. Also provides opportunities to engage elected and appointed officials.

• **Final Planning Meeting (FPM)** - ensures the readiness of all components and resolution of any outstanding issues. No significant changes should be made during or after this FPM.

**Exercise Planning Team**

The exercise planning team is led by a team leader. The team determines exercise objectives, designs the scenario, ensures their activities are aligned with the overall multiyear plan, and creates the exercise plan. Exercise plans have clear objectives, define exercise roles and responsibilities and management structure based on NIMS/ICS, and procedures for debriefings/hot wash, and AAR/IP or Corrective Action Plan development. The exercise planning team also creates other needed documentation and coordinates logistics including safety of participants.

For evacuations, while agencies can and do conduct exercises such as TTXs and FEs to test plans and mobilization capabilities, there will be no opportunity to exercise an actual evacuation. The 2013 **NCHRP REPORT 740: A TRANSPORTATION GUIDE FOR ALL-HAZARDS EMERGENCY EVACUATION** stresses the importance of including as many agencies as possible and representatives of populations with special needs in the planning process.

**Helpful Tips for the Exercise Planning Team**

These and the remainder of the helpful tips in this section are based on the following sources: 2013 HSEEP, 2014 MTI Exercise Handbook, 2014 NCHRP Report 777; 2015 TDOT Comprehensive Exercise Plan, 2013 NIPP.

• In exercises and drills managed by another agency, participate in exercise planning to ensure the DOT role is realistic to operations.

• In exercises and drills managed by your DOT, ensure all key stakeholders participate.

• Plan for high-probability and low-probability events.

• Consider special needs populations and pets.

• Exercise planning team should keep key officials, state EMA, and other stakeholders in the loop.

• Safety should always be top of mind.

• Have a clear organizational structure based on ICS structure

• Use project management tools and processes

• Start evaluation planning and fill key evaluation roles at the start of this process

• Review the detailed checklists for discussion-based exercises, operations-based exercises, and facilitated exercises are available in the 2014 MTI Exercise Handbook.

• Insure adequate play for all participants

• Exercise focus should be driven by objectives, not by the scenario

• The number of objectives should be limited (few rather than many)

• Use the SMART guidelines to develop exercise objectives
**Exercise Objectives**

The exercise objectives selected for the exercise will drive scenario selection, evaluation, and all other aspects of exercise development. Therefore, exercise objectives should be prudently chosen with input from elected and appointed officials. Following SMART guidelines assist planning teams in identifying and developing relevant exercise objectives:

- Specific – objectives address who, what, when, where, why.
- Measurable – measures should define quantity, quality, etc. with a focus on concrete outcomes/actions.
- Achievable – objectives should be feasible for players
- Relevant – objectives should be pertinent to the agency’s mission, goals, or strategic intent
- Timeframe – reasonable timeframe should accompany each objective

In addition, keep the number of exercise objectives to a feasible number, and focus on exercising emergency functions assigned to the DOT by the state. The following are sample exercise objectives:

**Demonstrate capability to**

- Mobilize resources for contraflow operations
- Track and document resources
- Conduct effective situational assessment
- Identify alternative transportation solutions
- Respond to an Active Shooter event

The 2014 MTI Exercise Handbook (p. 128, Table 13) presents a list of example objectives based on Wisconsin Emergency Management, 2004. They include:

- Communications: “To determine the ability to establish and maintain communications essential to support response to an incident/accident and the immediate recovery, including establishing interoperable communications with first responder agencies.”
- Damage Assessment: “To demonstrate the ability to organize and conduct damage assessment, including the collection of information to facilitate response by first responder organizations, support of over-weight permits, and recovery activities.”
- Emergency Public Information: “To determine the capability of the emergency public information system to disseminate timely and accurate emergency response information in languages and methods appropriate to the community; evaluate the ability to work with the media and maintain media monitoring and rumor control; evaluate the adequacy of the electronic signboards, travel information radio, 5-1-1 system, and agency website for maintaining timely travel information to the public.”
- Emergency Evacuation: “To determine the adequacy of the evacuation plan for the jurisdiction and the ability of officials to effectively coordinate an evacuation. Demonstrate the capability and procedures to provide access, egress and emergency routing (including contraflow where appropriate) to support mass care for persons displaced by a disaster in another community.”

**Roles and Responsibilities**
Key exercise roles are noted in 2013 HSEEP, Table 4.1. The roles include:

- Exercise director – oversees all exercise functions
- Evaluator – observes, documents, and analyzes the exercise; has expertise in functional areas they observe
- Lead Evaluator – oversees team of evaluators; is familiar with all issues concerning the exercise; and, is able to analyze capabilities
- Facilitator – for Discussion-based exercises, keeps discussions aligned with exercise objectives; ensures all issues and objectives are covered
- Controller – for Operations-based exercises and some games, plans and manages exercise play and timeline, sets up and operates exercise, directs pace of the play by providing injects and other information, and ensures safety of participants.
- Senior Controller – oversees exercise organization including all controllers, manages exercise progress, oversees exercise setup and takedown, and debriefs controllers and evaluators.
- Safety Controller - monitors exercise safety during exercise setup, conduct, and cleanup

**Scenarios**

A scenario is a narrative or timeline used in Operations-based exercises and TTXs that “drives an exercise to test objectives” and “informed by actual threats and hazards....” (2013 HSEEP Glossary) Scenarios should include:

“(1) the general context or comprehensive story; (2) the required conditions that will allow players to demonstrate proficiency and competency in conducting critical tasks, demonstrating core capabilities, and meeting objectives; and (3) the technical details necessary to accurately depict scenario conditions and events” (HSEEP 2013, p. 3-12).


The 2014 MTI Exercise Handbook notes the benefits of basing the scenario on an actual event. According to the authors, Edwards and Goodrich, “An actual occurrence increases believability. Theoretically based scenarios decrease believability. The more artificialities that are used, the higher the likelihood of misunderstanding and rejection by participants.” For instance, Washington DOT used the 50-vehicle pileup on Snoqualmie Pass that occurred in February, 2007 to create a scenario for a TTX held in May 2007.

**Helpful Tips regarding Scenario Development**

- Scenarios should be realistic and challenging but not overwhelming
- Scenarios should focus on local threats and hazards
- Use subject-matter experts (SMEs) to create realism
• Use capabilities of MPOs (e.g., GIS mapping, extensive databases, stakeholder connections)
• Involve a broad, diverse team for scenario development
• Link MSEL entries to the Exercise Evaluation Guide (EEG) critical tasks to ensure the critical tasks and core capabilities can be demonstrated.
• Select three recent events; then, select the scenario that best supports exercise objectives.
• Scenarios can also be based on:
  o National Planning Scenarios
  o Findings of After Action Reports/Improvement Plans
  o Threat and Vulnerability Assessments
  o Current or Historical Events (local, national, or international)
  o Scenarios Developed for Research Studies (e.g., TCRP A-36 project)
• Consider the following when developing a scenario
  o Cascading effects involving lifeline functions
  o Flexible uses of the transportation system
  o Resource prioritization strategies
  o Mobility options and needs of all travelers including disadvantaged populations
  o Chain of authority when key personnel/decision-maker is unavailable
  o Critical information collection and dissemination
  o Identification of infrastructure priorities in response and recovery


Exercise Documentation
Exercise documentation is extremely important. Identification of strengths and areas of improvement can be accomplished without accurate and thorough documentation. The types of documents required for each exercise type are provided in Table 3.2 of the 2013 HSEEP:

• Situation Manual for TTXs and Games for all Participants
• Facilitator Guide for TTX and Game Facilitators
• Multimedia Presentation for TTX and Game for all Participants
• Exercise Plan for Drill, FE, and FSE for Players and Observers
• Controller and Evaluator Handbook for Drill, FE, and FSE for Controllers and Evaluators
• Master Scenario Events List for Drill, FE, FSE for Controllers, Evaluators, and Simulators
• Extent of Play Agreement for FE and FSE for Exercise Planning Team
• Exercise Evaluation Guides for TTX, Game, Drill, FE, and FSE for Evaluators
• Participant Feedback Form for all Exercises for all Participants

Note that Tennessee DOT follows HSEEP, EMAP, and Emergency Management Performance Grant (EMPG) exercise documentation guidance.

Exercise Conduct
Exercise Conduct involves the following key steps:

Step 1: Preparing for exercise play

Generally, discussion-based exercises require less preparation than operations-based exercises.

Both require room or site and seating set-up, equipment checks, multimedia presentation and handouts, sign-in sheets, and feedback forms. Also before an exercise, separate briefings are held for elected and appointed officials, facilitators/controllers/evaluators, players, observers, and actors.

Step 2: Managing exercise play

For Discussion-based exercises, the facilitator gives a multimedia presentation, and participant discussion will ensure. These discussions can be facilitated or moderated. Facilitated discussions occur in a plenary session or breakout sessions. Breakout group discussions are held before the moderated discussion in which a spokesperson from each group summarizes the key findings of the discussion. Evaluators observe and document these sessions.

For Operations-based exercises, it is important to clearly define and mark exercise areas and exercise materials to avoid confusion. Controllers control exercise flow and provide necessary data and injects to players. Activity and staff not in the exercise areas are simulated by the SimCell staff. Evaluators are pre-positioned at strategic locations to allow observation and documentation of exercise play and player response. Evaluators capture both quantitative and qualitative data using Exercise Evaluation Guides (EEGs). EEGs facilitate the exercise evaluation process by clearly delineating exercise objectives and associated core capabilities, capability targets, and critical tasks. Documentation of the exercise play through photos and video recordings can help train personnel, brief senior management, and improve future exercises.

Step 3: Wrap-up activities

Wrap-up activities including debriefings and a “Hot Wash” which is a debriefing conducted immediately after the exercise.

- Debriefings of exercise planning team members gather information about their satisfaction with the exercise, issues, and possible improvements. Participant Feedback Forms are used to collect participant feedback and help develop debriefing notes. The controller/evaluator debriefing provides an opportunity for controllers and evaluators to share their observations and key insights into strengths and areas for improvement.

- A Hot Wash, a forum for exercise participants to discuss exercise strengths and areas for improvement, is led by an experienced facilitator. Participant Feedback Forms can be distributed during the Hot Wash. For Operations-based exercises, a Hot Wash for each functional area is conducted.

Helpful Tips regarding Exercise Conduct
• Establish a contingency process to end the exercise in case of a real-world event.
• Document the exercise play through photos and video recordings which can be used to train personnel, brief senior management, and improve future exercises.
• Remember to document the debriefings.
• Consider providing psychological support during debriefings.

Exercise Evaluation
To create standardized evaluation mechanisms for the exercise and ability to track progress across multiple exercises, and meet funding or reporting requirements, once exercise objectives have been selected, identify core capabilities for each exercise objective. Next, identify capability targets (performance thresholds) for each of the core capabilities. Information regarding capability targets may be available from results of the THIRA or other risk assessments. Finally, identify the critical tasks needed to accomplish a core capability. Critical tasks are found in the EOP, SOPs, Mission Area Frameworks, or other sources.

The four key steps for Exercise Evaluation are discussed below:

Step 1: Planning for Exercise Evaluation
The first step in exercise evaluation is planning which should start during the Exercise Design and Development stage. Actions that should be taken include:

• Select lead evaluator
• Define evaluation team requirements and structure
• Develop Exercise Evaluation Guides which include objectives, core capabilities, targets, and critical tasks
• Recruit, train, and assign evaluators
• Develop evaluation documentation including exercise-specific details, evaluator team organization/assignments/locations, evaluator instructions, and evaluation tools
• Conduct a pre-exercise C/E briefing to confirm roles, responsibilities, and assignments and any changes

For evaluation of plans, CPG 101 v. 2 (page c-4) recommends asking the following questions:

• “Did an action, process, decision, or the operational timing identified in the plan make the situation worse or better?
• Were new alternate courses of action identified?
• Were the requirements of children, individuals with disabilities, and others with access and functional needs fully addressed and integrated into all appropriate aspects of the plan?
• What aspects of the action, process, decision, or operational timing make it something to keep in the plan?
• What aspects of the action, process, decision, or operational timing make it something to avoid or remove from the plan?
• What specific changes to plans and procedures, personnel, organizational structures, leadership or management processes, facilities, or equipment can improve operational performance?”

Step 2: Observing the exercise conduct and data collection
For discussion-based exercises, the evaluator or note-taker will record data from participant discussions. For operations-based exercises, the focus is on recording player actions. The data collected during this step will be essential in developing the AAR.

**Step 3: Analyzing data and identifying strengths and areas for improvement**

Data analysis will determine answers to the questions:

- Were exercise objectives met?
- Were the capability targets met? If not, why not?
- Were players able to perform core capabilities? Did they execute the critical tasks to meet capability targets? If not, what were the impacts and/or consequences?
- Do current plans, policies, and procedures support critical tasks and capability targets? Were participants familiar with these documents?

To determine the root causes of deficiencies, evaluators will closely review critical tasks not completed and targets not met.

**Step 4: Reporting exercise outcomes**

**Helpful Tips on Evaluations**

- Select facilitators and evaluators that know and are known by your agency
- Evaluators should evaluate only their own agency and profession and jurisdiction

**After Action Report (AAR)/Improvement Plan (IP)/Corrective Actions**

Lessons learned lead to helpful feedback for the DOT, personnel, and teams. They are reviewed, analyzed, and compiled into an After Action Report (AAR). The AAR provides documentation regarding strengths and weaknesses identified during the event. After an initial analysis step, a qualitative assessment is recommended especially for exercises, incidents, and planned events to develop an initial list of corrective actions. An Improvement Plan (IP) contains a list of corrective actions addressing capability gaps along with responsibility for each Corrective Action, target dates, and tracking mechanism. The IP should include source of funds for Corrective Actions, and how and when overseeing agency will be notified upon completion of a Corrective Action. The IP is based on the AAR and lessons learned along with relevant information from self-assessments, audits, and administrative reviews.

To develop a draft list of improvement areas and Corrective Actions, the reviewer asks the following questions:

What are the lessons learned for similar problems or scenarios?

What changes need to be made to:

- training, plans and procedures
- organizational structures, resources, systems
- management processes

...to improve performance?
(Adapted from HSEEP, 2013)

The AAR contains evaluation information, overview of performance with a focus on exercise objectives and the analysis of core capabilities. According to CPG 101 v. 2, the AAR should:

- Describe the reasons and need to conduct an AAR (e.g., review actions taken, identify equipment shortcomings, improve operational readiness, highlight strengths/initiatives)
- Describe the methods and agencies used to organize and conduct a review of the disaster, including how recommendations are documented to improve local readiness (e.g., change plans/procedures, acquire new or replace outdated resources, retrain personnel)
- Describe the links and connections between the processes used to critique the response to an emergency/disaster and the processes used to document recommendations for the jurisdiction’s exercise program
- Describe how the jurisdiction ensures that the deficiencies and recommendations identified in the AAR are corrected/completed.

p. c-10 Appendix C, CPG 101 v. 2

AAR templates should be reviewed and used to ensure that important information is not left out of the document. The exercise sponsor sends the draft AAR to exercise participants and elected and appointed officials will confirm conclusions in the AAR and areas for improvement.

After a draft AAR and IP have been developed, elected officials and key decision makers are provided an opportunity to review them and provide comments. An After-Action Meeting (AAM) is then held for personnel to review the updated AAR and the draft IP. The AAM facilitator should lead focused discussions, present the event timeline and responses to assist in event recall, and distribute a feedback form to gather additional comments and input. The final AAR and IP/Corrective Actions should be disseminated to all training and exercise participants and others affected by them.

Improvement planning can be used to support continuous improvement throughout the DOT by taking a consistent approach to related activities including issue resolution and information sharing, data collection from and analysis of exercises and events, and longer-term trend analysis. Regarding the maintenance of plans, each component of the plan should be reviewed and revised on a regular basis, AND after specific events such as key changes in resources, changes in guidance or standards, a major exercise or incident, or a change in officials.

**Helpful Tips on After Action Report/Improvement Plan/Corrective Actions**

- Corrective actions should be clear, specific, and actionable.
- Corrective actions should be within the DOT’s responsibility.
- Ensure support for the IP and Corrective Actions.
- Don’t forget to properly document the AAR process.
- Tasked individuals/entities may need to develop implementing documents.
- Share improvement recommendations related to NIMS, NIMS plans and training with the NIMS national coordination process.
- The HSEEP website provides helpful templates including AAR/IP templates.

Training Implementation Solutions

NCHRP SYNTHESIS 468: INTERACTIVE TRAINING FOR ALL-HAZARDS EMERGENCY PLANNING, PREPARATION, AND RESPONSE FOR MAINTENANCE AND OPERATIONS FIELD PERSONNEL identified and described training implementation challenges, and training needs and solutions. Key challenges for state DOTs identified were scheduling difficulties and limited budgets. Additional challenges included lack of qualified training staff, personnel turnover, distance issues, senior management issues, inadequate facilities and other resources, insufficient information about available training, and infrequent need for training. Training delivery solutions included in Table 15:

Table 15: Training Delivery Solutions

<table>
<thead>
<tr>
<th>Field Crew Meetings</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advantages</strong></td>
<td>Meetings are brief and are held on a regular basis at a location/time convenient to field personnel. Meetings are also focused and very relevant to field crew. Hands-on training is possible. Field personnel can practice a procedure or skill.</td>
</tr>
<tr>
<td><strong>Disadvantages</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Just-in-Time Training</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advantages</strong></td>
<td>High retention of training content Cost-effective</td>
</tr>
<tr>
<td><strong>Disadvantages</strong></td>
<td>Personnel are not provided the opportunity to practice a skill or process before its real-life application. Taking the time to train personnel may delay the response effort. Training personnel in an emergency situation when their level of stress is high may hinder the learning process.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interjurisdictional and Interagency Training and Exercises</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advantages</strong></td>
<td>Opportunity for face-to-face interactions with peers from other response agencies through these exercises is essential preparation for larger and more complex events. They will also help prepare agencies and their field personnel understand the ICS structure, their roles and responsibilities within the structure, and how they should integrate with</td>
</tr>
<tr>
<td><strong>Disadvantages</strong></td>
<td>Scheduling difficulties may impede the ability of a large percentage of field personnel to attend these sessions.</td>
</tr>
<tr>
<td>personnel from other entities for these events</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td></td>
</tr>
</tbody>
</table>

### **Joint Training**

<table>
<thead>
<tr>
<th><strong>Advantages</strong></th>
<th><strong>Disadvantages</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduling difficulties may be mitigated by delivering emergency training in conjunction with another related topic. Intra-agency interaction and communications may be facilitated.</td>
<td>Emergency component may need to be shortened or modified.</td>
</tr>
</tbody>
</table>

### **Asynchronous Training - Computer-based Training without Live Instructors**

<table>
<thead>
<tr>
<th><strong>Advantages</strong></th>
<th><strong>Disadvantages</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Alleviates the need to schedule the training in advance. Allows 24-hour access to the material. Some on demand services offer automated record keeping and trainee progress tracking.</td>
<td>Lack of ability to interact with other students and instructor limits learning. Student distraction may be more likely. Self-direction is needed.</td>
</tr>
</tbody>
</table>

### **Asynchronous Training - Prepackaged DVDs and CDs**

<table>
<thead>
<tr>
<th><strong>Advantages</strong></th>
<th><strong>Disadvantages</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Allows trainers to select appropriate training videos or CD or DVD training packages that is the best value for their needs. The packages usually focus on a particular topic and contain a variety of tools. Cost-effective because many trainees may view the content typically for a fixed cost. Online on-demand training may charge the agency per trainee. With VTC, CCTV, or SKYPE technology, it is possible to present the content to multiple locations.</td>
<td>When VTC, CCTV, or SKYPE technology is used, technology related issues can arise and connectivity and quality of the transmission may be inconsistent. Training videos and packages on CD ROMs and DVDs are not “on-demand;” the training needs to be scheduled. Interaction with instructors and other trainees is limited.</td>
</tr>
</tbody>
</table>

### **Train-the-Trainer**

<table>
<thead>
<tr>
<th><strong>Advantages</strong></th>
<th><strong>Disadvantages</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost-effective way to leverage limited resources. Alleviates having to hire additional training staff or consultants.</td>
<td>Content dilution could be possible as additional training tiers are added.</td>
</tr>
</tbody>
</table>

### **Planned Events, Incidents**

<table>
<thead>
<tr>
<th><strong>Advantages</strong></th>
<th><strong>Disadvantages (Incidents)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Both planned events and incidents are good opportunities to practice coordination, communications, resource mobilization, and traffic management/control strategies. Traffic incidents happen daily and provide many opportunities for practice.</td>
<td>There is no guarantee that a series of minor incidents, aside from traffic accidents, will occur prior to a disaster. Incidents, even minor ones, have more risk associated with them; for instance, a minor traffic</td>
</tr>
</tbody>
</table>
A large, geographically dispersed audience can be reached.
Allows identification of weaknesses or resource deficiencies in training, plans, procedures, and policies.
Allows the participation/interaction of key personnel in different geographic regions.
Improves individual performance, organizational communication, and coordination.
Dangerous scenarios may be simulated safely.
May or may not be web-based.

Good PC and Internet skills necessary for learners to gain full advantage of training.
In remote locations or other areas bad or no Internet access can hinder training.
Unforeseen connection problems may arise during training. If on the host’s end, training may be interrupted.
Bandwidth issues may cause delay or disruption.
May lack realism, and may not provide a true test of capabilities in an emergency situation.
For synchronous simulations, scheduling can be a problem.

Can present up-to-date information.
Summarizes materials from various sources.
Can adapt the material to student backgrounds and interests.
Highlights important concepts and materials.
Instructor enthusiasm can motivate students and enhance learning (McKeachie and Svinicki 2013)

Reduced development of problem-solving skills and interaction among students if sufficient interaction opportunities are not provided.
Scheduling difficulties
Cost of the training and travel, including time.
(Scheduling and travel issues may be alleviated through the use of VTC, VoIP, or similar technology.)

Cost is lower vs. classroom training.
Training is standardized.
Training can be provided anywhere with web access.

Training must be scheduled in advance.
Trainees may be distracted.
Ability to monitor student progress may be limited.
Access to a PC and Internet are required.
Familiarity with the Internet and basic PC skills are required.
In addition to these methods, Blended Training allows agencies to combine multiple methods, and choose desired aspects of each method. Cross-Training personnel can provide contingencies for situations that result in significant absenteeism.

**Helpful Tips on Training**
- Determine who (what positions) need what type of emergency management training including NIMS Core Curriculum training.
- In general, training should progress from individuals to intra-agency teams to interagency and interjurisdictional exercises.
- Establish professional qualifications, certifications, and/or performance standards for individuals and teams, whether paid or volunteer with the assistance of the NIC and the state EMA.
- Ensure that content and training methods comply with applicable standards and produce required skills and measurable proficiency.
- Ensure that all personnel with a direct role in emergency preparedness and emergency management complete the designated FEMA training.
- Establish or leverage partnerships with other agencies and organizations to coordinate and deliver NIMS training requirements in conformance with NIMS.
- Incorporate NIMS/ICS into all training and exercises.
- Identify what additional training resources may be needed in the community to support response and evacuation/shelter-in-place/quarantine activities.
- Strive to make the training interactive. Much learning can occur through instructor-student and student-student interactions.
- Make the training relevant and specific to real-world problems.
- Provide a chance for learners to reflect on their training. Then, provide opportunities to apply their new learning shortly thereafter.
- Acknowledge experience and knowledge by providing opportunities for participants to share information and practices.
- Maintain comprehensive training records, following EMAP standards and any applicable state or agency policy.
- Connect with the NIC for guidance on NIMS/ICS personnel training needs and qualifications for emergency management positions.
- The FHWA Peer-to-Peer (P2P) program offers technical assistance including training and education on traffic incident management/planned special event planning, procurement, deployment, and operations.
- Memberships in professional organizations can be leveraged to take advantage of their training and certification programs. Organizations include American Public Works Association, American Road and Transportation Builders Association, the American Traffic Safety Services Association, AASHTO’s Transportation Curriculum Coordination Council, International Municipal Signal Association.
- Job aids and on-the-job learning can help with training retention and recall.
- Technologies such as VOIP and VTC can broadcast classroom instruction to other districts or regional offices.
- Minor incidents provide an opportunity for personnel to hone their abilities and skills and identify gaps in training.

Useful training sources for NIMS/ICS include:
There are also many other sources of training on NIMS/ICS and other emergency management topics including regional coalitions, associations, member organizations, etc. These sources are noted in Chapter 2 of this Guide and in Chapter 5 of the NCHRP Synthesis 468 report.

**State DOT Emergency Management Training and Exercise Implementation Practices**

During interviews with state DOTs and case example agencies for the NCHRP Synthesis 44-12 project, the following courses were common elements in many of their training programs:

- IS-15.b: Special Events Contingency Planning for Public Safety Agencies
- IS-100: Introduction to the Incident Command System
- IS-200: ICS for Single Resources and Initial Action Incidents
- ICS-300: Intermediate ICS for Expanding Incidents
- ICS-400: Advanced ICS
- IS-552: The Public Works Role in Emergency Management
- IS-554: Emergency Planning for Public Works
- IS-556: Damage Assessment for Public Works
- IS-558: Public Works and Disaster Recovery
- IS-559: Local Damage Assessment
- IS-632: Introduction to Debris Operations
- IS-700: Introduction to the National Incident Management System
- IS-701.a: NIMS Multiagency Coordination System (MACS)
- IS-703.a: NIMS Resource Management
- IS-706: NIMS Intrastate Mutual Aid—An Introduction
- IS-800: Introduction to the National Response Framework
- SHRP 2 National Traffic Incident Management Responder Training.
NCHRP Synthesis 468 contains the full training matrices for Arizona DOT’s Emergency Management Training for its Maintenance and Landscaping/Natural Resources personnel. Portions of the matrices that include NIMS and ICS for various roles and functions are shown below.

**Maintenance Roadway, Signing, and Striping Personnel**

*Highway Operations Worker*

- Basic Incident Command IS-100
- National Incident Management System IS-700

*Tech 1*

- Traffic Incident Management
- Control of Hazardous Energy

*Supervisor*

- ICS for Expanding Incidents IS-200
- National Response Framework IS-800

*Superintendent*

- Intermediate Incident Command IS-300
- Advanced Incident Command IS-400

**Landscape/Natural Resources Personnel**

*Highway Operations Worker*

- Basic Incident Command System IS-100
- National Incident Management System IS-700
- Hazard Communication
- OSHA/DOT Hazardous Materials
- Traffic Incident Management

*Tech 1*

- Traffic Incident Management
- Control of Hazardous Energy
- Introduction to Wildland Firefighting

*Supervisor*

- ICS for Expanding Incidents IS-200
- National Response Framework IS-800

*Superintendent*
• Intermediate Incident Command IS-300
• Advanced Incident Command IS-400

In addition to this training, Arizona DOT’s Highway Operations Worker undergoes almost 40 additional training courses ranging from fire safety to flagger ATSSA certification to computer security awareness. Tech 1 takes about 10 additional courses including advanced work zone traffic control and maintenance communications. Supervisors must also take about 10 additional courses such as On Boarding New Employees and Managing Resources Effectively. Superintendents take 6 additional courses including the NHI Maintenance Leadership Academy and Performance Measurement. (NCHRP Synthesis 468)

The following is a portion of Tennessee DOT’s emergency management training based on the DOT’s training needs assessment.

• NIMS/ICS training; required courses vary based on worker function
• ICS Train-the-Trainer Course
• TIM training for all responders
• Protect the Queue training for all field employees
• Hazardous Materials Awareness training for all field employees
• Hazardous Materials for Operational Level Response
• Active Shooter Training for all employees
• TVA Fixed Nuclear Facilities Emergency Worker Training
• Oak Ridge Emergency Worker Training
• Storm Spotter Training
• Emergency Radio Communications Training
• Emergency Management Support Team Training
• Damage Assessment Workshop
• Basic Public Information
• TEMA 101
• Instructor Methodology
• Principles of Emergency Management
• Exercise Development
• Communications Leader Course
• Search and Navigation Courses
  o TEMA Search Operations
  o GPS Land Navigation Course
  o Basic Visual Tracking
  o Managing Search Operations
• National Domestic Preparedness Consortium (NDPC) - DHS-funded courses
• FEMA National Emergency Training Center

(Tennessee DOT Case Study)

State DOTs use a number of different methods from field crew meetings to train-the-trainer to interagency training and exercises to deliver emergency management training to their field personnel. Examples of these methods include the following:

Field Crew Meetings
• Caltrans - tailgate meetings are used to share information and to train field personnel on new procedures, technologies, equipment, and safety issues. The meetings are held every 10 days at every maintenance yard. (NCHRP Synthesis 468)
• Missouri DOT - field personnel are trained on specific tasks during field crew meetings. (NCHRP Synthesis 468)

Cross Training

• Tennessee DOT – TDOT cross-trains four to five additional persons to perform a particular function that has been designated as an “Essential Function” of the DOT. Essential Functions are defined in the TDOT COOP. The training need depends on the gap between the number of people that already have the capacity to perform the function and the number that is required. The actual amount of required training depends on function and system complexity. (Tennessee DOT Case Study)

Joint Training

• The Second Strategic Highway Research Program’s (SHRP 2) National Traffic Incident Management Responder Training Course is multidisciplinary and interjurisdictional and has been delivered to many state DOT personnel along with police, fire, and other responders. The SHRP 2 program has also created a Train-the-Trainer Course for incident responders and managers as well as an e-Learning training course being implemented through the National Highway Institute. (NCHRP Synthesis 468)
• Arizona DOT - TIM training is conducted by the Arizona Department of Public Safety using the train-the-trainer version of the SHRP 2 National TIM Responder Training course. It contains a strong ICS element and promotes a shared understanding of TIM requirements. SHRP 2’s two-day TTT course facilitates widespread use of the multidisciplinary training; the training was shortened to a four-hour format by the Arizona Department of Public Safety. The training participants include state DOT personnel and federal, state, county, and local emergency response providers, and tow truck operators and contractors. (NCHRP Synthesis 468)

Interjurisdictional and Interagency Training and Exercises

• Arizona - Arizona Division of Emergency Management (ADEM) Training and Exercise Office offers a wide variety of training courses that cover emergency planning, mitigation, awareness, operations, incident command, and domestic preparedness. ADEM also offers emergency response training to ADOT and other agencies for an unlikely accident at the Palo Verde Nuclear Generating Station. (NCHRP Synthesis 468)
• Blue Cascades Exercises - Pacific Northwest Economic Region and the Center for regional Disaster Resilience bring public and private partners from the U.S. and Canada in the Pacific Northwest to hold a series of scenario-based TTXs – Caltrans is one of the state DOT participants. The goals of the TTXs are to “raise awareness of infrastructure interdependencies and associated vulnerabilities, impacts, and preparedness gaps, identifying potential solutions to make needed improvements.” (http://www.regionalresilience.org/interdependencies.html) The exercise sequence involved 1) concept identification, 2) workshop, 3) development of materials and scenarios, 4) TTX, 5) After-Action Conference, and 6) Final Report. Scenarios have included a major earthquake, flood and pandemic, physical attack, and cyber-attack. The exercises result in
Regional Action Plans for stakeholders. These plans have included projects and actions in: interdependencies, coordination, roles and responsibilities, response, logistics and distribution, information sharing, training and education, public information, and economic continuity and recovery. (Caltrans case study, NCHRP Report 777)

- Tennessee - TDOT has an arrangement with the Tennessee Emergency Management Agency (TEMA) to “exchange” training in which training delivered by TEMA is complimentary to TDOT personnel and vice versa. Interdisciplinary training with the Civil Air Patrol is organized at least once yearly. TEMA's Technical Hazards Branch provides multiple training and training exercises on radiological emergency response for Tennessee’s two nuclear plants on an annual basis to federal, state, and local responders. Plans are exercised on an annual basis; a federal exercise is also conducted by FEMA and the Nuclear Regulatory Commission yearly at one of the two plants. (Tennessee Case Study, NCHRP Synthesis 468)

- Texas – Texas DOT personnel participate in ICS-300 (Intermediate ICS) and ICS-400 (Advanced ICS) training courses hosted by local fire departments and police departments. (NCHRP Synthesis 468)

Train-the-Trainer (TTT)

- Arizona DOT - in its first NIMS/ICS rollout, Arizona DOT trained 10 instructors to teach Introduction to ICS and Introduction to NIMS to 4,600 district personnel in a classroom setting. (NCHRP Synthesis 468)

- Iowa DOT – Iowa DOT used TTT for the IS-100 and IS-200 (ICS for Single Resources) courses. District office and DMV enforcement trainers were trained first; they then trained more than 1,600 personnel over the course of a year. (NCHRP Synthesis 468)

Computer Simulation

- I-95 Corridor Coalition’s three-dimensional, multiplayer computer gaming simulation technology (www.i95vim.com) provides scenario-based, interactive, and real-time incident management training (Virtual Incident Management Training, I-95 Corridor Coalition n.d.).

- On-line eXercise System is a web-based training system for disaster professionals and communities. The system can implement TTX, FE, and FSE using the Internet.

- FEMA’s Emergency Management Institute (EMI) offers a series of virtual tabletop exercises focused on disaster training.

- The Transportation Emergency Response Application (TERA) is a free, web-based exercise system for the transportation, transit, rail, and airport domains and is compliant with NIMS/ICS and HSEEP. Initially focused on transit scenarios and developed and field-tested under the Transit Cooperative Research Program (TCRP) Project A-36, Command-Level Decision Making for Transit Emergency Managers, TERA initial transit scenarios are being modified and expanded with NCHRP funds to include state DOT roles. Additional information regarding TERA and the A-36 project can be found at www.tera.train-emst.com and in TCRP Web-Only Document 60/NCHRP Web-Only Document 200, available online at: http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_w60.pdf (NCHRP Synthesis 468)

Classroom Training
- Arizona DOT – Arizona Division of Emergency Management and Texas A&M provide emergency management classroom training to ADOT field personnel. (NCHRP Synthesis 468)
- California – Caltrans provides classroom training including monthly NIMS/SEMS/ICS and First Observer training at its Maintenance Training Academy to new and existing maintenance personnel. (Caltrans Case Study)
- Tennessee DOT - Supervisors are required to take IS-200 (ICS for Single Resources) and IS-800 (Introduction to the NRF) in a classroom setting. Managers are required to take ICS-300 (Intermediate ICS) and ICS-400 (Advanced ICS) delivered through classroom training as well. (NCHRP Synthesis 468)

Examples of exercise implementation by exercise type are provided in the following section:

**Workshops/Seminars**

- California – Caltrans uses workshops to deliver all-hazards training and COOP/COG training: each year, Caltrans holds four All-Hazards Training Workshops (one per quarter) and three COOP/COG Workshops. (Caltrans Case Study)
- Texas - Texas DOT’s emergency response providers and key district staff members including district engineers and M&O directors participate in various workshops and seminars including an annual hurricane preparedness workshop. The 2013 workshop covered evacuation, re-entry, cleanup, and response techniques. The following were also covered: protocols for the suspension of construction schedules, radio communications and interoperability, debris and environmental contracts, MAP-21, FHWA Emergency Relief and FEMA Public Assistance reimbursement, volunteer management, and the Maintenance Management System (NCHRP Synthesis 468)
- Vermont - Six discussion-based exercises (seminars or workshops) a year focusing on VTrans specific threats and hazards are attended by VTrans field personnel. (NCHRP Synthesis 468)

**Table-Top Exercise (TTX)**

- California - Caltrans participates in the annual CalEMA Golden Guardian Executive Table Top Exercise (TTX) which is held one month prior to the actual CalEMA Golden Guardian FSE. (Caltrans Case Study)
- Arizona - The Arizona DOT’s districts hold TTXs that relate to ADOT’s statewide exercises. (NCHRP Synthesis 468)
- Tennessee – TDOT conducts TTXs with representatives of tasked organizations to help validate its EOP.
- Multiple DOTs - The I-STEP Highway and Motor Carrier AASHTO Peer Exchange tabletop Exercise for state DOTs held at the 2012 Transportation Hazards and Security Summit and Peer Exchange highlighted regional prevention, protection, and response practices. The TTX scenario was a terrorist attack against critical infrastructure and an attack against a critical bridge coinciding with a natural disaster. (NCHRP Synthesis 468)

**Drills**
- California - Caltrans holds drills to evaluate personnel, technologies, and equipment; and for the development of plans and procedures. Caltrans’ personnel undergo monthly drills to ensure that they can mobilize the technologies and equipment; during the drills, any issues with the systems will be flagged as well. Monthly drills are held on Caltrans Microwave Telephone and Fixed Satellite Telephone and Sat Com Auxiliary Radio Systems which is a satellite communications system owned, managed, and operated by Caltrans for the purpose of emergency communications within Caltrans and with other agencies. (Caltrans Case Study)

**Functional Exercises (FEs)**

- Iowa - The Iowa DOT holds three to four regional TTXs annually. (NCHRP Synthesis 468)
- Missouri - Half of Missouri DOT’s exercises are FEs; typically, 10 percent or more of the field personnel are involved in these exercises. Scenarios have included earthquakes; severe weather, including snow, ice, and tornados; and situations involving nuclear power plants and terrorism. (NCHRP Synthesis 468)

**Full-Scale Exercises (FSEs)**

- Arizona - Arizona DOT personnel including field personnel, emergency preparedness and management, and communications personnel participated in a 2011 statewide exercise on an improvised explosive device explosion. (NCHRP Synthesis 468)
- California - Caltrans participates in the statewide Great California Shakeout Interagency Exercise organized by the Earthquake Country Alliance. (Caltrans Case Study)
- Caltrans also participates in the annual CalEMA Golden Guardian FSE. The FSE is preceded by planning meetings and a TTX and a Hot Wash and After Action Report meeting is held after the meeting. (Caltrans Case Study) In addition, Caltrans also incorporates and evaluates technologies such as Caltrans Microwave Telephone and Fixed Satellite Telephone and Sat Com Auxiliary Radio Systems into its FSEs.
- Texas – Texas DOT organizes and hosts at least one FSE each year usually focusing on contraflow evacuations in which personnel and equipment are mobilized and the process timed and evaluated. Additional participants have included the Texas Department of Public Safety, the fire marshal, and local law enforcement agencies. (NCHRP Synthesis 468)
- Vermont - VTrans field personnel undergo 4-5 day FSEs organized by the state EOC. The scenarios are hurricanes and WMD. (NCHRP Synthesis 468)

**Training Evaluation**

U.S. Office of Personnel Management (OPM) regulations require federal agencies to create and demonstrate the value of their training programs to their missions through training evaluation. The regulations require the implementation of a training evaluation system that helps the agency determine future investments in training and development. The evaluations should determine whether learning has occurred; whether learning was applicable to job performance or other behaviors affecting results; whether the learning was applied to the employee’s job; and, if he or she did, whether there was positive impact on performance or other job-related behaviors.

The 2011 U.S. Office of Personnel Management (OPM) Training Evaluation Field Guide uses the regulations as a foundation for the guide. The 2011 OPM Guide stresses the importance of ensuring that training positively affects agency mission and outcomes through evaluation. The Guide uses the New World Kirkpatrick Four Levels™ to offer a structured way in which agencies can evaluate their training and training programs.
The original Kirkpatrick training evaluation method is comprised of four levels:

- **Level 1:** Reaction. Trainees provide their reactions to the instructor or facilitator regarding training subject/content, facilities, and schedule, and improvements using a feedback form. This is probably the easiest level to implement.
- **Level 2:** Learning. Determines the extent to which trainees have learned the training material. What the trainee knew before the training (pre-test) is compared to what he/she has learned from the training (post-test).
- **Level 3:** Behavior. Trainee application of training to their jobs is evaluated by observation of the trainee during work or during a drill.
- **Level 4:** Results. Demonstrates whether the training is having the desired outcome (e.g., faster response to an incident). Provides information on the effectiveness of a training program. Outcomes need to be measured before and after the training.

The new Kirkpatrick method recommends using the four levels in reverse: starting with level 4 and proceeding to level 1. Also, to help prove value of training, it is necessary to conduct both quantitative and qualitative evaluation for each level and to provide evidence of the connection between level 4 and levels 1, 2, and 3.

The new Kirkpatrick method also adds the following to each of the levels:

- **Level 1:** Engagement (to what degree participants are involved and interested in the learning intervention) and Relevance (to what degree the content of the learning intervention is applicable to the jobs of the participants).
- **Level 2:** Confidence (to what degree training participants feel confident to apply the newly obtained knowledge and skills on the job) and Commitment (to what degree training participants commit that they will apply newly obtained knowledge and skills on the job).
- **Level 3:** Required Drivers (process and systems that reinforce, monitor, encourage and reward performance of critical behaviors on the job) and On-the-Job Learning (ongoing self-education on the job by the training graduate)
- **Level 4:** Leading Indicators (short term observations and measurements that suggest that critical behaviors are on track to create a positive impact on the desired results) The new method stresses the importance of monitoring behaviors and required drivers to ensure they are being applied on the job; and, monitoring leading indicators to determine whether correct behaviors have been chosen.

The 2011 OPM Guide notes the distinction between *effective training* - training that fulfills Level 1 and 2 expectations – and *training effectiveness* which relates to Level 3 and 4 – application of the training to the employee’s job which produces results that contribute to the agency’s mission.

State transportation agencies should refer to the 2011 OPM Guide as a resource guide when developing training evaluations. The Guide contains case studies and sample tools including participant surveys appropriate for each of the four Levels and observation checklists for Levels 2 and 3. In addition, the Guide provides a brief summary of additional evaluation tools that may be considered for use.
Appendix A1: Annotated Bibliography

A. Institutional Context for Emergency Management

Recent guidance at the national level has been reshaping the focus and long-term direction of transportation agencies. Since the publication of the Guide in 2010, four significant national level directives and executive orders have been issued, with an emerging focus on the complementary goals of infrastructure protection and system resiliency as part of security and emergency management.


- **Presidential Policy Directive-21: Critical Infrastructure Security and Resilience (2013)** focuses on the need for secure critical infrastructure that is able to withstand and rapidly recover (resilient) from all hazards.

- **2013 National Infrastructure Protection Plan: Partnering for Critical Infrastructure Security and Resilience** emphasizes the importance of resilience, the need to reduce all-hazards vulnerabilities and mitigate potential consequences of incidents or events that do occur.

- **Executive Order 13636: Improving Critical Infrastructure Cybersecurity (2013)** provides a technology-neutral cybersecurity framework and means to promote and the adoption of cybersecurity practices.

- **Executive Order 13653, Preparing the United States for the Impacts of Climate Change (2013)** requires federal agencies to integrate considerations of the challenges posed by climate change effects into their programs, policies, rules and operations to ensure they continue to be effective, even as the climate changes.

- **The Moving Ahead for Progress in the 21st Century Act (MAP–21)**, the previous transportation reauthorization legislation, focused on performance management and established a series of national performance goals. The goals related to safety, congestion reduction, freight movement and economic vitality and environmental sustainability are of particular relevance to emergency management. MAP-21 also required incorporating performance goals, measures, and targets into transportation planning.

- **The Fixing America’s Surface Transportation (FAST) Act**, enacted in 2015, expands the focus on the resiliency of the transportation system. “It is in the national interest to encourage and promote the safe and efficient management, operation, and development of resilient surface transportation systems that will serve the mobility needs of people and freight and foster economic growth and development within and between States and urbanized areas through metropolitan and statewide transportation planning processes.” It requires strategies to reduce the vulnerability of existing transportation infrastructure to natural disasters and expands the scope of consideration of the metropolitan planning process to include improving transportation system resiliency and reliability.


Synopsis. The National Disaster Recovery Framework describes “how the whole community works together to restore, redevelop, and revitalize the health, social, economic, natural, and environmental fabric of the community.” The new Framework incorporates the edits to the National Preparedness Goal and new lessons learned. Additional changes made to the Framework include:

“Increased focus on Recovery’s relationship with the other four mission areas. Updated Recovery Support Functions (RSFs) to reflect changes in Primary Agencies and Supporting Organizations. Additional language on science and technology capabilities and investments for the rebuilding and recovery efforts.”


Synopsis. The NRF is aligned with NIMS and provides capabilities to save lives, protect property, and meet basic human needs. Response activities occur before, during, and after an incident and can overlap with the start of Recovery activities. The following changes were made to the Framework:

- The addition of a new core capability, Fire Management and Suppression.
- Three revised core capability titles
  - Logistics and Supply Chain Management;
  - On-scene Security, Protection, and Law Enforcement; and
- Three revised core capability definitions
  - Environmental Response/ Health and Safety;
  - Fatality Management Services; and
  - Logistics and Supply Chain Management.


Synopsis. The National Mitigation Framework covers the capabilities necessary to reduce the loss of life and property by lessening the effects of disasters, and focuses on risk (understanding and reducing it),
resilience (helping communities recover quickly and effectively after disasters), and a culture of preparedness. The new Framework incorporates the edits to the National Preparedness Goal and new lessons learned including a revised core capability title, Threats and Hazards Identification. In addition, the following changes have been made:

“Additional language on science and technology efforts to reduce risk and analyze vulnerabilities within the mitigation mission area. Updates on the Mitigation Framework Leadership Group (MitFLG), which is now operational. Updates to the Community Resilience core capability definition to promote preparedness activities among individuals, households and families.”


Synopsis. The National Protection Framework focuses on “actions to deter threats, reduce vulnerabilities, and minimize the consequences associated with an incident.” The new Framework incorporates the edits to the National Preparedness Goal and new lessons learned. In addition, the following changes have been made:

“Updated Cybersecurity Core Capability Critical Tasks to align with the Mitigation, Response, and Recovery Mission Areas. Additional language on science and technology investments to protect against emerging vulnerabilities are included within the protection mission area. Additional language on interagency coordination within the protection mission area to support the decision-making processes outlined within the framework.”


Synopsis. The National Prevention Framework focuses on terrorism and addresses the capabilities necessary to avoid, prevent, or stop imminent threats or attacks. Some core capabilities overlap with the Protection mission area. The updates include edits to the Nation Preparedness Goal, and lessons learned. Other edits include:

“Updates to Coordinating Structure language on Joint Operations Centers and the Nationwide Suspicious Activity Reporting Initiative. Clarification on the relationship and differences between the Prevention and Protection mission areas. Updated language on the National Terrorism Advisory System (NTAS) as part of the Public Information and Warning core capability. Additional language on science and technology investments within the prevention mission area.”

Synopsis. The 2011 National Preparedness Goal was updated in 2015. The key changes are described in the National Preparedness Goal, Second Edition – What’s New Fact Sheet. The National Preparedness Goal itself has not changed:

“A secure and resilient nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk.”

The following changes were made to the National Preparedness Goal document:

- Introduction: Language added to stress the importance of community preparedness and resilience.
- Risk and the Core Capabilities: Enhanced items on cybersecurity and climate change.
- Preliminary Targets: Updated preliminary targets.
- New Core Capability: A new core capability, Fire Management and Suppression, was added.
- Core Capability Titles: Revised the following core capability titles: o Threats and Hazard Identification (Mitigation) – revised to Threats and Hazards Identification; o Public and Private Services and Resources (Response) – revised to Logistics and Supply Chain Management; o On-scene Security and Protection (Response) – revised to On-scene Security, Protection, and Law Enforcement; and o Public Health and Medical Services (Response) – revised to Public Health, Healthcare, and Emergency Medical Services.
- Core Capability Definitions: Several of the core capability definitions were revised.

NIPP 2013: Partnering for Critical Infrastructure Security and Resilience


Synopsis. From DHS.gov: “Our Nation’s well-being relies upon secure and resilient critical infrastructure—the assets, systems, and networks that underpin American society. The National Infrastructure Protection Plan (NIPP) — NIPP 2013: Partnering for Critical Infrastructure Security and Resilience — outlines how government and private sector participants in the critical infrastructure community work together to manage risks and achieve security and resilience outcomes.”

“NIPP 2013 represents an evolution from concepts introduced in the initial version of the NIPP released in 2006 and revised in 2009. The National Plan is streamlined and adaptable to the current risk, policy, and strategic environments. It provides the foundation for an integrated and collaborative approach to achieve the vision of: “[a] Nation in which physical and cyber critical infrastructure remain secure and resilient, with vulnerabilities reduced, consequences minimized, threats identified and disrupted, and
response and recovery hastened.” NIPP 2013 meets the requirements of Presidential Policy Directive-21: Critical Infrastructure Security and Resilience, signed in February 2013. The Plan was developed through a collaborative process involving stakeholders from all 16 critical infrastructure sectors, all 50 states, and from all levels of government and industry. It provides a clear call to action to leverage partnerships, innovate for risk management, and focus on outcomes."

The NIPP 2013 has six chapters, two appendices, and four supplements. After an Executive Summary, the Introduction (Chapter 1) gives an overview of the NIPP 2013 and its evolution from the 2009 NIPP. Chapter 2 defines the Vision, Mission, and Goals of the NIPP 2013, while Chapter 3 describes the Critical Infrastructure Environment in terms of key concepts, risk, policy, operations, and partnership. Core Tenets are established in Chapter 4. Ways to collaborate to manage risk are given in Chapter 5. The final chapter is a Call to Action (“Steps to Advance the National Effort”). The Sector-Specific Plans of the 16 critical infrastructure sectors are being updated to align with the NIPP 2013. The web page for NIPP 2013 also contains links to training courses, critical infrastructure partnership courses, security awareness courses, and the relevant authorities (i.e. laws, regulations, and guidance).

**NIPP Supplemental Tool: Incorporating Resilience into Critical Infrastructure Projects**

**NIPP Supplemental Tool: Executing a Critical Infrastructure Risk Management Approach**
B. Nature and Degree of Hazards/Threats

Hazards have continued to evolve since the First Edition was published. In more recent times transportation agencies have been experiencing more and more devastating events either due to natural causes (e.g., Superstorm Sandy, extensive Midwest flooding, powerful hurricanes), caused by unintentional human intervention (e.g., truck crashes and fires on the Oakland Bay Bridge and in the Boston tunnels, oil train derailments) or intentional acts (e.g. cyber-attacks and armed assault including active-shooter incidents). Because today's transportation systems are integrated cyber and physical systems, there are greater cyber risks than ever, including the risk of a cyber incident impacting not only data, but the control systems and physical infrastructure of transportation agencies.

Risk-Based Transportation Asset Management: Building Resilience into Transportation Assets: Report 5: Managing External Threats Through Risk-Based Asset Management


Synopsis. From the Transport Research International Documentation (TRID) Database: “This is the fifth of five reports examining how risk management complements asset management. This last report examines how physical, climatic, seismic and other external threats can be addressed in risk-based asset management programs. The first four reports and the literature review emphasized the definition of risk as the positive or negative effect of uncertainty or variability upon agency objectives. Those reports emphasized that risks could be positive in that some types of uncertainty can create opportunities. However, this report will focus more on negative risks, or threats. These risks generally are external, and while highly probable over a long period of time, are difficult to predict in the short term. Randomness and variability complicate planning for them. In August 2011, Hurricane Irene reached one of the nation’s most northern states, Vermont, and damaged 480 bridges out of a total network of 2717 bridges. In one day, more bridge deterioration occurred than normally would occur over many years. Accurate prediction of such events is nearly impossible. Such a significant storm had not struck Vermont for 83 years. In managing risks to assets from external threats, this report emphasizes the Three Rs, which are Redundancy, Robustness and Resiliency. These will be defined, described and illustrated through several agency examples. Asset management plays a critical role in each, particularly Robustness and Resiliency. Including the Three Rs in asset planning efforts can better prepare agencies to cope with an increasingly unpredictable world.”

The report consists of five major sections. The first is an introductory section. The second section discusses Climate Change and Extreme Weather Risks. The FHWA’s Vulnerability Assessment Model is presented in the third section. The fourth section discusses Risked-Based Approaches to Protecting Assets. Summary and Conclusions make up the fifth section.


Synopsis. From the Transport Research International Documentation (TRID) Database: “This Guide presents comprehensive, step-by-step guidance on assessing hazardous materials emergency response needs at state, regional, and local levels; matching state, regional, and local capabilities with potential emergencies involving different types of hazardous materials; and assessing how quickly resources can be brought to bear in an emergency. The methodology described in the Guide is designed to be scalable, allowing the implementation results to be aggregated at the local level up through regional, state, and national levels. Also, the Guide is designed to connect as many components as possible to already-established standards, guidelines, regulations, and laws, so that the Guide will remain current as these underlying components are updated. In addition, the Guide discusses appropriate means for maintaining currency of the information over time. The Guide and accompanying spreadsheet tool (on the attached CD-ROM), which leads planners through the assessment process, will be most useful for local jurisdictions that have limited resources and expertise in hazardous materials emergency response planning.”

Protecting America's Roads, Bridges, and Tunnels: The Role of State DOTs in Homeland Security


Synopsis. According to AASHTO’s page on Bridge and Tunnel Security, this publication is an "AASHTO brochure providing an overview of the vital role that State DOTs – builders and operators of the nation’s busiest roads, tunnels, and bridges – often play when emergency situations occur”. It explains “why the security of our roads, bridges, and tunnels is important, what DOTs are doing to improve it, and the keys to better partnership.” The document has four sections. The introductory section (“State Dots—Guardians of The Nation’s Transportation Infrastructure”) argues that DOTs’ foremost expanded roles include all-hazards emergency management and critical asset protection.

The two body sections explain DOTs' expertise and needs in their respective domain. The first body section (“A Vital Support Role in Emergency Management”) notes that DOTs’ all-hazards emergency management expertise includes the key functions of: traveler information; traffic management; transportation facilities, personnel, and equipment; and infrastructure reconstruction capabilities. At the same time, resources are needed to address the enhancement of Intelligent Transportation System (ITS) capabilities; improvement of emergency response; and better communications. The second body section (“Protecting Critical Transportation Assets”) notes that DOTs have several available countermeasures: deterrence and detection, defense, and design and re-design. But to address critical asset protection, DOTs need resources to address: bridge retrofits, bridge reconstruction, tunnel protection costs.”
In its concluding section ("The Road Ahead – Setting an Agenda for Partnership in Security"), this publication advocates that DOTs be "considered as first responders in terms of support from the Department of Homeland Security." For strengthening this partnership, four cornerstones are proposed:

- recognition of vital role of DOT in emergency management and homeland security,
- responsiveness to road, bridge, and tunnel asset protection needs,
- additional resources for DOT to meet homeland security challenges, and
- support for transportation-related security research.


Synopsis. From the Transport Research International Documentation (TRID) Database: “This report presents guidance on adaptation strategies to likely impacts of climate change through 2050 in the planning, design, construction, operation, and maintenance of infrastructure assets in the United States (and through 2100 for sea-level rise). In addition to the practitioner’s guide and research report, this project also developed the following items:

1. "a software tool that runs in common web browsers and provides specific, region-based information on incorporating climate change adaptation into the planning and design of bridges, culverts, stormwater infrastructure, slopes, walls, and pavements;
2. "tables that provide the same information as the previously mentioned software tool, but in a spreadsheet format that can be printed; and

This report discusses physical countermeasures against storm surge, floods, extreme temperature, and permafrost instability. Storm surge countermeasures include shoreline revetments, elevated approach roadways, extended wingwalls, enhanced scour protection and strengthened deck tie-downs. Additional flood countermeasures include floodplain culverts, hardening the slopes of approach roadways, adding/raising spans, and protecting coatings. Countermeasures against extreme temperature include widening expansion joints, redesigning bearings, and strengthening beams and girders. Countermeasures against permafrost instability include mitigation techniques such as the use of reflective surfaces, air convection embankment, geosynthetic reinforcement, thermosyphons, berms, air ducts, insulation materials and lightweight fill materials.

Hazard Data Sources and Tools
Information on potential hazards, including probability and possible effects, can be obtained from the Federal Emergency Management Association (FEMA), State Emergency Management and Civil Defense Agencies, National Weather Service (NWS), Environmental Protection Agency (EPA), U.S. Department of


**FEMA Map Service Center**

Available: [http://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1](http://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1)

This Federal Emergency Management Agency source provides map information for a variety of users affected by floods, including homeowners and renters, real estate and flood determination agents, insurance agents, engineers and surveyors, and federal and exempt customers. There are flood maps, databases, map viewers, documents and publications providing comprehensive information. Further aspects of the site include FEMA issued flood maps available for purchase, definitions of FEMA flood zone designations, and information about FIRMettes, a full-scale section of a FEMA Flood Insurance Rate Map (FIRM) that users can create and print at no charge.

**FEMA Flood Map Service Center (MSC)**


The FEMA Flood Map Service Center is the official public source for flood hazard information produced in support of the National Flood Insurance Program (NFIP). The MSC contains official flood maps, access a range of other flood hazard products, and tools for better understanding flood risk. subsection of

**Interior Geospatial Emergency Management System (IGEMS)**


The Department of Interior Geosciences and Environmental Change Science Center IGEMS, which replaced the Natural Hazards Support System (NHSS), provides online maps containing the latest available information on earthquakes, earthquake shakemaps, streamflow data, floods, volcanoes, wildfires, and weather hazards.

**National Weather Service GIS Data Portal (NOAA)**

Available: [http://www.nws.noaa.gov/gis/shapepage.htm](http://www.nws.noaa.gov/gis/shapepage.htm)

Current weather, forecasts and past weather data are available in Shapefile and other formats from the Data Portal. Hazards include tornados, hurricanes, rain, snowfall, floods and other weather related hazards.

**Advanced Hydrologic Prediction Service (NOAA)**


The NOAA Advanced Hydrologic Prediction Service (AHPS) is a web-based suite of forecast products that displays the magnitude and uncertainty of occurrence of floods or droughts, from hours to days and months, in advance. The majority of the observed water level data displayed on the AHPS web pages
originates from the United States Geological Survey's (USGS) National Streamflow Information Program which maintains a national network of stream gauges. In addition, real-time water level information is collected from other federal, state, and local stream gauge networks.

Climate Change & Extreme Weather Vulnerability Assessment Framework (2012)

The Federal Highway Administration's (FHWA's) Climate Change and Extreme Weather Vulnerability Assessment Framework is a guide for transportation agencies interested in assessing their vulnerability to climate change and extreme weather events. It gives an overview of key steps in conducting vulnerability assessments and uses in-practice examples to demonstrate a variety of ways to gather and process information.

Space Weather

Over the last several years, both industry and the Federal government have played an active role in maintaining and advancing the Nation’s ability to forecast and mitigate the various impacts of space weather. These actions include taking steps to replace aging satellite assets essential to monitoring and forecasting space weather, proposing space-weather standards for both the national and international air space, developing regulations to ensure the continued operation of the electric grid during an extreme space weather event, proposing a new option for replacing crucial Extra High Voltage (EHV) transformers damaged by space weather, and developing domestic production sources for EHV transformers.

NOAA Space Weather Prediction Center
Available: http://www.swpc.noaa.gov/
The official U.S. government space weather bureau.

SpaceWeather.com
Available: spaceweather.com
This website maintains all space weather information including current conditions.

White House Workshop on Space Weather, 2015

The White House held a workshop titled “Space Weather: Understanding Potential Impacts and Building Resilience” in October of 2015 and released the following supporting commitments to enhance Space-Weather Preparedness:

- **Releasing New Space Environment Data.** The U.S. Air Force (USAF), in partnership with the National Oceanic and Atmospheric Administration (NOAA), will provide Space Environment Data from the current GPS constellation and other U.S. Government satellites. This data could be used to validate space-weather forecast models, potentially enhancing space-weather prediction capabilities. As a first step, USAF and NOAA will make data from January 2014 – a month characterized by a high level of solar activity – freely available on data.gov, providing an opportunity for users to explore the scientific value of the data. Within three months of this release, the Office of Science and Technology Policy will chair an interagency group to evaluate
the utility of the released data and to determine if the open data archive should be expanded to include additional historical and near real-time data.

- **Launching a Space Weather Data Initiative.** In accordance with President Obama’s Executive Order on making open and machine-readable the new default for government information, as well as on demonstrated successes of unleashing innovation and technology for disaster response and recovery, the Administration will launch a Space Weather Data Initiative. The goals of this Initiative are to (1) make easily accessible and freely available on data.gov an unprecedented amount of space weather-related data; (2) engage with the private sector and the open-data community to leverage the open data and promote the development of data-driven tools, applications, and technology to enhance space-weather preparedness; and (3) expand U.S. Government capacity for using open data, innovation, and technology to support effective and efficient response to and recovery from space-weather events.

- **Increasing International Collaboration.** To strengthen international coordination and cooperation on space-weather preparedness, the Department of State will organize workshops and meetings in Washington, DC with embassy staff from a multitude of nations. These workshops and meetings will provide an opportunity for other countries to learn more about the purpose and goals of the National Space Weather Strategy and accompanying Action Plan; ensure that policymakers in and leaders of partner nations recognize space weather as a global challenge; and facilitate the sustained, coordinated participation of partner nations in relevant international space-weather initiatives.

- **Including Space Weather in Transportation “Fundamentals” Reports.** Space weather can affect communication and navigation systems that are critical for safe and efficient transportation systems. By incorporating space-weather considerations into two reports that provide comprehensive and up-to-date guidance on the major elements of a state’s all-hazards transportation security and emergency management program – Security 101: A Physical Security Primer for Transportation, and A Guide to Emergency Response Planning at State Transportation Agencies – officials will have the information they need to incorporate space-weather considerations into transportation-security guidelines and emergency-response plans. The American Association of State Highway and Transportation Officials (AASHTO) – a nonprofit association representing highway and transportation departments in the 50 states, the District of Columbia, and Puerto Rico – will ensure that space weather is included in the next edition of these two AASHTO Special Committee on Transportation Security and Emergency Management “fundamentals” reports.

- **Incorporating Space Weather into Emergency-Management Training and Activities.** Space-weather events can, directly or indirectly, cause or exacerbate major disasters or emergencies, and can interfere with or impair disaster response, relief, and recovery efforts. The National Emergency Management Association (NEMA) – a professional association of and for emergency management directors, dedicated to enhancing public safety by improving the nation’s ability to prepare for, respond to, and recover from all emergencies and disasters – will increase training and education related to space weather. Specifically, NEMA will:
  - Partner with the International Association of Emergency Managers to host a space-weather focused webinar for members of both groups, reaching up to 1200 state and local emergency managers, and others working in the emergency-management field;
  - Incorporate space weather into training and education opportunities for newly appointed state emergency management directors; and
  - Incorporate space weather into the NEMA Homeland Security Committee’s policy focus on infrastructure resilience.
• **Raising Awareness of Space Weather in the Aviation Sector.** As part of their commitment to promote safety, security and a healthy U.S. airline industry, Airlines for America – America’s largest airline trade association – will work with member carriers and their affiliates to educate the community on space weather and its effects on aviation, which include degradation or loss of satellite navigation signals and radio transmissions for communication.

**Fact Sheet: New Actions to Enhance National Space-Weather Preparedness**
[https://www.whitehouse.gov/sites/default/files/microsites/ostp/space_weather_fact_sheet_final.pdf](https://www.whitehouse.gov/sites/default/files/microsites/ostp/space_weather_fact_sheet_final.pdf)

**National Space Weather Strategy and National Space Weather Action Plan**

**National Space Weather Strategy**
Available: [https://www.whitehouse.gov/sites/default/files/microsites/ostp/final_nationalspaceweatherstrategy_20151028.pdf](https://www.whitehouse.gov/sites/default/files/microsites/ostp/final_nationalspaceweatherstrategy_20151028.pdf)

**National Space Weather Action Plan**
Available: [https://www.whitehouse.gov/sites/default/files/microsites/ostp/final_nationalspaceweatheractionplan_20151028.pdf](https://www.whitehouse.gov/sites/default/files/microsites/ostp/final_nationalspaceweatheractionplan_20151028.pdf)

The newly released National Space Weather Strategy (Strategy) and Space Weather Action Plan (Action Plan) were developed by an interagency group of experts, with input from stakeholders outside of the Federal government, to clearly articulate how the Federal government will work to fill these gaps by coordinating, integrating, and expanding existing policy efforts; engaging a broad range of sectors; and collaborating with international counterparts. The Strategy identifies goals and establishes the guiding principles that will guide these efforts in both the near and long term, while the Action Plan identifies specific activities, outcomes, and timelines that the Federal government will pursue accordingly. The Action Plan broadly aligns with investments proposed in the President's Budget for Fiscal Year 2016 and will be reevaluated and updated within 3 years of the date of publication or as needed.

Taken together, the Strategy and Action Plan will facilitate the integration of space-weather considerations into Federal planning and decision making to achieve preparedness levels consistent with national policies, and enhance the resilience of critical technologies infrastructures to the potentially debilitating effects of space weather on the people, economy, and security of the United States.

**Cybersecurity**

**Protection of Transportation Infrastructure from Cyber Attacks: A Primer**


*Synopsis:* This primer, a joint product of two Transportation Research Board Cooperative Research Programs, provides transportation organizations basic reference material concerning cybersecurity concepts, guidelines, definitions and standards. The primer delivers fundamental strategic, management and planning information associated with cybersecurity and its applicability to transit and state
department of transportation operations. The primer presents fundamental definitions and rationales that describe the principles and practices that enable effective cybersecurity risk management. The goals of the primer are to: increase awareness of cybersecurity as it applies to highway and public transportation; plant the seeds of organizational culture change; address those situations where the greatest risks lie; and provide industry-specific approaches to monitoring, responding to and mitigating cyber threats. Individual chapters address: myths of cybersecurity; risk management, risk assessment and asset evaluation; plans and strategies, establishing priorities, organizing roles and responsibilities; transportation operations cyber systems; countermeasures; training; and security programs and support frameworks.

Critical Infrastructure Protection: Sector-Specific Agencies Need to Better Measure Cybersecurity Progress.


Synopsis: U. S. critical infrastructures, such as financial institutions, commercial buildings, and energy production and transmission facilities, are systems and assets, whether physical or virtual, vital to the nation’s security, economy, and public health and safety. To secure these systems and assets, federal policy and the National Infrastructure Protection Plan (NIPP) establish responsibilities for federal agencies designated as sector-specific agencies (SSA), including leading, facilitating, or supporting the security and resilience programs and associated activities of their designated critical infrastructure sectors. The Government Accountability Office’s (GAO’s) objectives were to determine the extent to which SSAs have (1) identified the significance of cyber risks to their respective sectors’ networks and industrial control systems, (2) taken actions to mitigate cyber risks within their respective sectors, (3) collaborated across sectors to improve cybersecurity, and (4) established performance metrics to monitor improvements in their respective sectors. To conduct the review, GAO analyzed policy, plans, and other documentation and interviewed public and private sector officials for 8 of 9 SSAs with responsibility for 15 of 16 sectors. GAO recommends that certain SSAs collaborate with sector partners to develop performance metrics and determine how to overcome challenges to reporting the results of their cyber risk mitigation activities. Four of these agencies concurred with GAO’s recommendation, while two agencies did not comment on the recommendations.

Maritime Critical Infrastructure Protection: DHS Needs to Enhance Efforts to Address Port Cybersecurity


Synopsis: The nation’s maritime ports handle more than $1.3 trillion in cargo each year: a disruption at one of these ports could have a significant economic impact. Increasingly, port operations rely on computerized information and communications technologies, which can be vulnerable to cyber-based attacks. Federal entities, including the Department of Homeland Security’s (DHS’s) Coast Guard and the Federal Emergency Management Agency (FEMA), have responsibilities for protecting ports against cyber-related threats. The Government Accountability Office (GAO) has designated the protection of federal information systems as a government-wide high-risk area since 1997, and in 2003 expanded this to include systems supporting the nation’s critical infrastructure. This statement by Gregory C.
Wilshusen, Director, Information Security Issues, addresses (1) cyber-related threats facing the maritime port environment and (2) steps DHS has taken to address cybersecurity in that environment. In preparing this statement, GAO relied on work supporting its June 2014 report on cybersecurity at ports (GAO-14-459). In its June 2014 report on port cybersecurity, GAO recommended that the Coast Guard include cyber-risks in its updated risk assessment for the maritime environment, address cyber-risks in its guidance for port security plans, and consider reestablishing the sector coordinating council. GAO also recommended that FEMA ensure funding decisions for its port security grant program are informed by subject matter expertise and a comprehensive risk assessment. DHS has partially addressed two of these recommendations since GAO’s report was issued.

**Guidebook on Best Practices for Airport Cybersecurity**


**Synopsis:** Cybersecurity is a growing issue for all organizations, including airports. While the risks to traditional information technology (IT) infrastructure are often highlighted, many airports also rely on industrial control systems that introduce risks that are less apparent. The increasing practice of Bring Your Own Device (BYOD), whereby employees use their own personal devices for business purposes such as email and remote access to airport systems, brings its own risks that must be managed. These risks cannot be eliminated, but they can be reduced through implementation of industry standards, best practices, and awareness programs for employees. This report provides resources for airport managers and IT staff to reduce or mitigate inherent risks of cyberattacks on technology-based systems. Traditional IT infrastructure such as servers, desktops, and network devices are covered along with increasingly sophisticated and interconnected industrial control systems, such as baggage handling, temperature control, and airfield lighting systems. Accompanying this guidebook is a CD-ROM (CRP-CD-171) of multimedia material that can be used to educate all staff at airports about the need, and how, to be diligent against cybersecurity threats.

**A Summary of Cybersecurity Best Practices**


**Synopsis:** This report contains the results and analysis of a review of best practices and observations in the field of cybersecurity involving electronic control systems across a variety of industry segments where the safety-of-life is concerned. This research provides relevant benchmarks that are essential to making strategic decisions over the next steps for the National Highway Traffic Safety Administration's (NHTSA’s) research program. This publication is part of a series of reports that describe the authors' initial work under the goal of facilitating cybersecurity best practices in the automotive industry (Goals 1 and 2). The information presented herein increases the collective knowledge base in automotive cybersecurity; helps identify potential knowledge gaps; helps describe the risk and threat environments; and helps support follow-on tasks that could be used to establish security guidelines.

**Assessment of the Information Sharing and Analysis Center Model**

**Synopsis:** An Information Sharing and Analysis Center (ISAC) is a trusted, sector-specific entity that can provide a 24-hour per day and 7-day per week secure operating capability that establishes the coordination, information sharing, and intelligence requirements for dealing with cybersecurity incidents, threats, and vulnerabilities. An ISAC can serve as an industry resource by which to gather key information about cybersecurity events and issues and identify, communicate, and analyze potential impacts of such concerns to the sector. This report presents findings from an assessment of the ISAC model, and how ISAC’s are effectively implemented in other sectors. The report also explains how a new sector ISAC could be formed by leveraging existing ISAC models. This publication supports the goal of facilitating the establishment of a cybersecurity information sharing forum in the automotive sector (Goal 2).

**Maritime Critical Infrastructure Protection: DHS Needs to Better Address Port Cybersecurity**


**Synopsis:** U.S. maritime ports handle more than $1.3 trillion in cargo annually. The operations of these ports are supported by information and communication systems, which are susceptible to cyber-related threats. Failures in these systems could degrade or interrupt operations at ports, including the flow of commerce. Federal agencies—in particular Department of Homeland Security (DHS)—and industry stakeholders have specific roles in protecting maritime facilities and ports from physical and cyber threats. The Government Accountability Office’s (GAO’s) objective was to identify the extent to which DHS and other stakeholders have taken steps to address cybersecurity in the maritime port environment. GAO examined relevant laws and regulations; analyzed federal cybersecurity-related policies and plans; observed operations at three U.S. ports selected based on being a high-risk port and a leader in calls by vessel type, e.g. container; and interviewed federal and nonfederal officials. GAO recommends that DHS direct the Coast Guard to (1) assess cyber-related risks, (2) use this assessment to inform maritime security guidance, and (3) determine whether the sector coordinating council should be reestablished. DHS should also direct the Federal Emergency Management Agency (FEMA) to (1) develop procedures to consult DHS cybersecurity experts for assistance in reviewing grant proposals and (2) use the results of the cyber-risk assessment to inform its grant guidance. DHS concurred with GAO’s recommendations.

**Critical Infrastructures: Background, Policy, and Implementation**


**Synopsis:** The nation’s health, wealth, and security rely on the production and distribution of certain goods and services. The array of physical assets, functions, and systems across which these goods and services move are called critical infrastructures (e.g., electricity, the power plants that generate it, and the electric grid upon which it is distributed). The national security community has been concerned for some time about the vulnerability of critical infrastructure to both physical and cyberattack. In May 1998, President Clinton released Presidential Decision Directive No. 63. The Directive set up groups within the federal government to develop and implement plans that would protect government-operated infrastructures and called for a dialogue between government and the private sector to
develop a National Infrastructure Assurance Plan that would protect all of the nation's critical infrastructures by the year 2003. While the Directive called for both physical and cyber protection from both man-made and natural events, implementation focused on cyber protection against man-made cyber events (i.e., computer hackers). Following the destruction and disruptions caused by the September 11 terrorist attacks in 2001, the nation directed increased attention toward physical protection of critical infrastructures. Over the intervening years, policy, programs, and legislation related to physical security of critical infrastructure have stabilized to a large extent. However, current legislative activity has refocused on cybersecurity of critical infrastructure. This report discusses in more detail the evolution of a national critical infrastructure policy and the institutional structures established to implement it. The report highlights two primary issues confronting Congress going forward, both in the context of cybersecurity: information sharing and regulation.

Critical Infrastructure Protection: More Comprehensive Planning Would Enhance the Cybersecurity of Public Safety Entities’ Emerging Technology


**Synopsis:** Individuals can contact fire, medical, and police first responders in an emergency by dialing 911. To provide effective emergency services, public safety entities such as 911 call centers use technology including databases that identifies phone number and location data of callers. Because these critical systems are becoming more interconnected, they are also increasingly susceptible to cyber-based threats that accompany the use of Internet-based services. This, in turn, could impact the availability of 911 services. The U.S. Government Accountability Office (GAO) was asked to review federal coordination with state and local governments regarding cybersecurity at public safety entities. The objective was to determine the extent to which federal agencies coordinated with state and local governments regarding cybersecurity efforts at emergency operations centers, public safety answering points, and first responder organizations involved in handling 911 emergency calls. The five identified federal agencies (Departments of Homeland Security, Commerce, Justice, and Transportation and Federal Communications Commission (FCC)) have to varying degrees, coordinated cybersecurity-related activities with state and local governments. These activities included (1) supporting critical infrastructure protection-related planning, (2) issuing grants, (3) sharing information, (4) providing technical assistance, and (5) regulating and overseeing essential functions. However, except for supporting critical infrastructure planning, federal coordination of these activities was generally not targeted towards or focused on the cybersecurity of state and local public safety entities involved in handling 911 emergency calls. Under the critical infrastructure protection planning activity, the Department of Homeland Security (DHS) coordinated with state and local governments and other federal stakeholders to complete the Emergency Services Sector-Specific Plan. The plan is to guide the sector, including the public safety entities, in setting protective program goals and objectives, identifying assets, assessing risks, prioritizing infrastructure components and programs to enhance risk mitigation, implementing protective programs, measuring program effectiveness, and incorporating research and development of technology initiatives into sector planning efforts. It also addressed aspects of cybersecurity of the current environment. However, the plan did not address the development and implementation of more interconnected, Internet-based planned information technologies, such as the next generation of 911 services. According to DHS officials, the plan did not address these technologies, in part, because the process for updating the sector-specific plan will begin after the release of the revised National Infrastructure Protection Plan—a unifying framework to enhance the safety of the nation’s critical infrastructure. A revised plan was released in December 2013, and, according to DHS, a new sector-specific plan is estimated to be
completed in December 2014. Until DHS, in collaboration with stakeholders, addresses the cybersecurity implications of the emerging technologies in planning activities, information systems are at an increased risk of failure or being unavailable at critical moments. Under the other four activities, federal agencies performed some coordination related activities for public safety entities including administering grants for information technology enhancements, sharing information about cyber-based attacks, and providing technical assistance through education and awareness efforts. For example, the Departments of Transportation and Commerce allocated $43.5 million in grants to states over a 3-year period, starting in September 2009, to help implement enhancements to 911 system functionality. While these grants were not targeted towards the cybersecurity of these systems, cybersecurity was not precluded from the allowed use of the funds. GAO recommends that the Secretary of Homeland Security collaborate with emergency services sector stakeholders to address the cybersecurity implications of implementing technology initiatives in related plans.

The Critical Infrastructure Gap: U.S. Port Facilities and Cyber Vulnerabilities


Synopsis: This paper looks at the current state of cybersecurity as it relates to U.S. ports. Topics include port security prior to and post-September 11th, the Maritime Transportation Security Act, the Port Security Grant Program, and cybersecurity awareness, preparedness and recovery. Case studies outlining current port security and practices are presented for the Port of Baltimore, Maryland, the Port of Houston, Texas, the Port of Los Angeles, California, the Port of Long Beach, California, the Port of Vicksburg, Mississippi, and the Port of Beaumont, Texas. Of the six ports studied most had not conducted a cybersecurity vulnerability assessment nor developed a cyber incident response plan. Policy recommendations are provided to address port cybersecurity improvements.

Critical Infrastructure Security: Assessment, Prevention, Detection, Response


Synopsis: This book examines best practices and trends in infrastructure security at both the physical and digital level. Methods and tools for assessing, preventing, detecting and responding to security threats are outlined. The book is divided into five parts: (1) Security risk and vulnerability assessment; (2) Modeling and simulation tools; (3) Cybersecurity; (4) Monitoring and surveillance; (5) Security systems integration and alarm management.

Homeland Security: DHS’s Progress and Challenges in Key Areas of Maritime, Aviation, and Cybersecurity


Synopsis: Securing the nation’s transportation and information systems is a primary responsibility of the Department of Homeland Security (DHS). Within DHS, the Transportation Security Administration (TSA) is responsible for securing all transportation modes; U.S. Customs and Border Protection (CBP) is responsible for cargo container security; the U.S. Coast Guard is responsible for protecting the maritime environment; and the National Protection and Programs Directorate is responsible for the cybersecurity
of critical infrastructure. This statement focuses on the progress and challenges DHS faces in key areas of maritime, aviation, and cybersecurity. It is based on U.S. Government Accountability Office (GAO) products issued from June 2004 through November 2009, as well as ongoing work on air cargo security. DHS has made progress in enhancing security in the maritime sector, but key challenges remain. For example, as part of a statutory requirement to scan 100 percent of U.S.-bound container cargo by July 2012, CBP has implemented the Secure Freight Initiative at select foreign ports. However, CBP does not have a plan for fully implementing the 100 percent scanning requirement by July 2012 because it questions the feasibility, although it has not performed a feasibility analysis of the requirement. Rather, CBP has planned two new initiatives to further strengthen the security of container cargo, but these initiatives will not achieve 100 percent scanning. Further, TSA, the Coast Guard, and the maritime industry took a number of steps to enroll over 93 percent of the estimated 1.2 million users in the Transportation Worker Identification Credential (TWIC) program (designed to help control access to maritime vessels and facilities) by the April 15, 2009 compliance deadline, but they experienced challenges resulting in delays and in ensuring the successful execution of the TWIC pilot. While DHS and the Coast Guard have developed a strategy and programs to reduce the risks posed by small vessels, they face ongoing resource and technology challenges in tracking small vessels and preventing attacks by such vessels. In the aviation sector, TSA has made progress in meeting the statutory mandate to screen 100 percent of air cargo transported on passenger aircraft by August 2010 and in taking steps to strengthen airport security, but TSA continues to face challenges. TSA’s efforts include developing a system to allow screening responsibilities to be shared across the domestic air cargo supply chain, among other steps. Despite these efforts, TSA and the industry face a number of challenges including the voluntary nature of the program, and ensuring that approved technologies are effective with air cargo. TSA also does not expect to meet the mandated 100 percent screening deadline as it applies to air cargo transported into the U.S., in part due to existing screening exemptions for this type of cargo and challenges in harmonizing security standards with other nations. GAO is reviewing these issues as part of its ongoing work and will issue a final report next year. In addition, TSA has taken a variety of actions to strengthen airport security by, among other things, implementing a worker screening program; however, TSA still faces challenges in this area. DHS has made progress in strengthening cybersecurity, such as addressing some lessons learned from a cyber attack exercise, but further actions are warranted. Since 2005, GAO has reported that DHS has not fully satisfied its key responsibilities for protecting the nation’s computer-reliant critical infrastructures and has made related recommendations to DHS, such as bolstering cyber analysis and warning capabilities and strengthening its capabilities to recover from Internet disruptions. DHS has since developed and implemented certain capabilities to satisfy aspects of its responsibilities, but it has not fully implemented GAO’s recommendations and, thus, more action is needed to address the risk to critical cybersecurity infrastructure.

Freight Rail Security: Actions Have Been Taken to Enhance Security, but the Federal Strategy Can Be Strengthened and Security Efforts Better Monitored


Synopsis: An attack on the U.S. freight rail system could be catastrophic because rail cars carrying highly toxic materials often traverse densely populated urban areas. The Department of Homeland Security’s (DHS) Transportation Security Administration (TSA) is the federal entity primarily responsible for securing freight rail. The U.S. Government Accountability Office (GAO) was asked to assess the status of efforts to secure this system. This report discusses (1) stakeholder efforts to assess risks to the freight rail system and TSA’s development of a risk-based security strategy; (2) actions stakeholders have taken
to secure the system since 2001, TSA’s efforts to monitor and assess their effectiveness, and any challenges to implementing future actions; and (3) the extent to which stakeholders have coordinated efforts. Federal and industry stakeholders have completed a range of actions to assess risks to freight rail since September 2001, and TSA has developed a security strategy; however, TSA’s efforts have primarily focused on one threat, and its strategy does not fully address federal guidance or key characteristics of a successful national strategy. Specifically, TSA’s efforts to assess vulnerabilities and potential consequences to freight rail have focused almost exclusively on rail shipments of certain highly toxic materials, in part, because of concerns about their security in transit and limited resources. However, other federal and industry assessments have identified additional potential security threats, including risks to critical infrastructure and cybersecurity. Although many stakeholders agreed with TSA’s initial strategy, going forward TSA has agreed that including other identified threats in its freight rail security strategy is important, and reported that it is reconsidering its strategy to incorporate other threats. Additionally, in 2004, GAO reported that successful national strategies should identify performance measures with targets, among other elements. TSA’s security strategy could be strengthened by including targets for three of its four performance measures and revising its approach for the other measure to ensure greater consistency in how performance results are quantified. Federal and industry stakeholders have also taken a range of actions to secure freight rail, many of which have focused on securing certain toxic material rail shipments and have been implemented by industry voluntarily; however, TSA lacks a mechanism to monitor security actions and evaluate their effectiveness, and new requirements could pose challenges for future security efforts. GAO’s Standards for Internal Control in the Federal Government calls for controls to be designed to ensure ongoing monitoring. While the freight rail industry has taken actions to better secure shipments and key infrastructure, TSA has limited ability to assess the impacts of these actions because it lacks a mechanism to systematically track them and evaluate their effectiveness. Having such information could strengthen TSA’s efforts to efficiently target its resources to where actions have not been effective. New, mandatory security planning and procedural requirements will also necessitate additional federal and industry efforts and resources, and may pose some implementation challenges for both federal and industry stakeholders. Federal and industry stakeholders have also taken a number of steps to coordinate their freight rail security efforts; however, federal coordination can be enhanced by more fully leveraging the resources of all relevant federal agencies. GAO previously identified a number of leading practices for effective coordination that could help TSA strengthen coordination with federal and private sector stakeholders.

Cybersecurity Resources

Protection of Transportation Infrastructure from Cyber Attacks: A Primer (2016)


Synopsis. This Primer provides transportation organizations with reference materials concerning cybersecurity concepts, guidelines, definitions, and standards. It delivers strategic, management, and planning information associated with cybersecurity and its applicability to transit and state DOT operations. It includes definitions and rationales that describe the principles and practices that enable effective cybersecurity risk management. The primer provides transportation managers and employees with greater context and information regarding the principles of information technology and operations systems security planning and procedures. The report is supplemented with an Executive Briefing for
use as a 20-minute presentation to senior executives on security practices for transit and DOT cyber and industrial control systems.


Synopsis. The ICS security guide advises on how to reduce the vulnerability of computer-controlled industrial systems to malicious attacks, equipment failures, errors, inadequate malware protection and other threats. The Second Edition of the Guide includes new guidance on how to tailor traditional IT security controls to accommodate unique ICS performance, reliability and safety requirements, as well as updates to sections on threats and vulnerabilities, risk management, recommended practices, security architectures and security capabilities and tools.

Recommended Practice: Securing Control And Communications Systems In Transit Environments

Citation. APTA Standards Development Program Recommended Practice: Securing Control And Communications Systems In Transit Environments, APTA. Available:
Part IIIa and IIIb in development

Synopsis. This document covers recommended practices for securing control and communications systems in transit environments. These Recommended Practices address the importance of control and communications security to a transit agency, provide a survey of the various systems that constitute typical transit control and communication systems, and identify the steps that an agency would follow to set up a successful security program. The documents address the security of the following passenger rail and/or bus systems: SCADA, traction power control, emergency ventilation control, alarms and indications, fire/intrusion detection systems, train control/signaling, fare collection, automatic vehicle location (AVL), physical security feeds (CCTV, access control), public information systems, public address systems, and radio/wireless/related communication.

NIST Cybersecurity Framework


The National Institute of Standards and Technology (NIST), the Federal Information Processing Standards (FIPS), with transportation specific guidance available from APTA and FHWA, have developed recommended practices and standards. There are international standards and recommendations from the International Organization for Standardization (ISO), the Information Systems Audit and the Control Association (ISACA), and Control Objectives for Information and related Technology (COBIT).

US Department of Transportation (USDOT) Cybersecurity Action Team

The US Department of Transportation (USDOT) developed a Cybersecurity Action Team, as part of
Executive Order 13636, to implement the Department’s Cyber Incident Response Capability Program. The team monitors, alerts and advises the ITS and surface transportation communities of incidents and threats, and leverages the extensive body of assessments and research done by Federal Highway Administration (FHWA) staff related to the security threats and vulnerabilities of the United States’ transportation systems.


Incident Hotline: 1-888-282-0870

Website: [https://www.us-cert.gov/](https://www.us-cert.gov/)

The US Computer Emergency Readiness Team (US-CERT), part of DHS’ National Cybersecurity and Communications Integration Center (NCCIC), provides technical assistance, coordinates cyber information sharing and proactively manage cyber risks through its 24x7 operations center. US-CERT distributes vulnerability and threat information through its National Cyber Awareness System (NCAS), and operates a Vulnerability Notes Database to provide technical descriptions of system vulnerabilities.

**Industrial Control Systems Cyber Emergency Response Team (ICS-CERT)**

Available: [https://ics-cert.us-cert.gov/](https://ics-cert.us-cert.gov/)

The Industrial Control Systems Cyber Emergency Response Team (ICS-CERT) operates cybersecurity operations centers focused on control systems security as part of the National Cybersecurity and Communications Integration Center (NCCIC). The team:

- Responses to and analyses industrial control systems (ICS) related incidents
- Provides onsite support for incident response and forensics
- Conducts malware analysis
- Coordinates responsible disclosure of ICS vulnerabilities/mitigations
- Shares vulnerability information and threat analysis through information products and alerts
- Provides security awareness training courses (see [http://ics-cert.us-cert.gov/Training-Available-Through-ICS-CERT](http://ics-cert.us-cert.gov/Training-Available-Through-ICS-CERT)).

**Transportation Security Administration (TSA) Transportation Systems Sector Cybersecurity Working Group (TSSCWG)**

Available: [https://www.dhs.gov/publication/cipac-trans-cybersecurity-agendas](https://www.dhs.gov/publication/cipac-trans-cybersecurity-agendas)

The TSA has authority to regulate cybersecurity in the transportation sector and provides cybersecurity pamphlets, a weekly newsletter, cybersecurity exercise support, and incident-specific threat briefings. TSA has pursued collaborative and voluntary approaches with industry. TSA DHS facilitates the Cybersecurity Assessment and Risk Management Approach (CARMA) for companies requesting assessments. TSA has hosted cybersecurity-focused Intermodal Security Training and Exercise Program (I-STEP) exercises, most recently in August 2014.

TSA and its industry partners established the Transportation Systems Sector Cybersecurity Working
Group (TSSCWG) to advance cybersecurity across all transportation modes. The TSSCWG strategy, completed in mid-2012, stated, “The sector will manage cybersecurity risk through maintaining and enhancing continuous awareness and promoting voluntary, collaborative, and sustainable community action.” The TSSCWG is developing implementation guidance for adoption of the NIST Framework.

**National Institute of Standards and Technology (NIST) Cybersecurity Framework**


The National Institute of Standards and Technology (NIST) is an agency of the U.S. Department of Commerce. The Computer Security Division (CSD), a component of NIST’s Information Technology Laboratory (ITL), provides standards and technology to protect information systems against threats to information and services. Executive Order 13636, Improving Critical Infrastructure Cybersecurity (2013) directed NIST to work with stakeholders to develop a voluntary cybersecurity framework – based on existing standards, guidelines, and practices - for reducing cyber risks to critical infrastructure.

**Cybersecurity Framework (CSF) Reference Tool**


A runtime database solution, have been created the allows the user to browse the Framework Core by functions, categories, subcategories, informative references, search for specific words, and export the current viewed data to various file types.

**NIST National Vulnerability Database**


National Vulnerability Database (NVD) is the U.S. government repository of standards-based vulnerability management data that includes databases of security checklists, security-related software flaws, misconfigurations, product names, and impact metrics.

**NIST Computer Security Division's Computer Security Resource Center (CSRC)**


This Center facilitates broad sharing of information security tools and practices, provides a resource for information security standards and guidelines, and identifies key security web resources to support users in industry, government, and academia. The CSRC is the primary gateway for gaining access to NIST computer security publications, standards, and guidelines plus other useful security-related information.

**NIST Security Publications**

Available: http://csrc.nist.gov/publications/PubsSPs.html

NIST has published over 300 Information Security guides that include Federal Information Processing Standards (FIPS), the Special Publication (SP) 800 series, Information Technology Laboratory (ITL) Bulletins, and NIST Interagency Reports (NIST IR). Most commonly referenced NIST publications include:

- **Special Publication 800-12: An Introduction to Computer Security: The NIST Handbook (1995).** Elements of security, roles and responsibilities, common threats, security policy,
and program management. Initially created for the federal government, most practices are applicable to the private sector.

- **Special Publication 800-14** Generally Accepted Principles and Practices for Securing Information Technology Systems (1996) describes common security principles that are used. It provides a high level description of what should be incorporated within a computer security policy. It describes what can be done to improve existing security as well as how to develop a new security practice. Eight principles and fourteen practices are described within this document.


- **Special Publication 800-53**, Recommended Security Controls for Federal Information Systems and Organizations (2013). Security control fundamentals, baselines by system-impact level, common controls, and tailoring guidelines that are applied to a system to make it "more secure".


- **Special Publication 800-150** Guide to Cyber Threat Information Sharing, (2016)


**National Cyber Investigative Joint Task Force – Analytical Group**


In 2008, the U.S. President mandated the National Cyber Investigative Joint Task Force (NCIJTF) to be the focal point for all government agencies to coordinate, integrate, and share information related
to all domestic cyber threat investigations. The FBI is responsible for developing and supporting the joint task force, which includes 19 intelligence agencies and law enforcement.

**Internet Crime Complaint Center (IC3)**


The Internet Crime Complaint Center (IC3) is a partnership between the Federal Bureau of Investigation (FBI) and the National White Collar Crime Center (NW3C). Internet crime complaints are reported online on the IC3 site. IC3 analysts review and research the complaints, disseminating information to the appropriate federal, state, local, or international law enforcement or regulatory agencies for criminal, civil, or administrative action, as appropriate.

**InfraGard**

Available: [https://www.infragard.org/](https://www.infragard.org/)

InfraGard is a partnership between the FBI, state and local law enforcement agencies, and the private sector - businesses, academic institutions and other participants - dedicated to sharing information and intelligence to prevent hostile acts against the U.S. With over 80 chapters, InfraGard chapters conduct local meetings pertinent to their area.

**National Cybersecurity Center of Excellence (NCCoE)**


Established in 2012 through a partnership among NIST, the State of Maryland and Montgomery County, the National Cybersecurity Center of Excellence is dedicated to furthering innovation through the rapid identification, integration and adoption of practical, standards-based cybersecurity solutions.
C. Emergency Management Program

Transportation plays a critical and unique role in emergency response. As the National Response Framework (NRF) states, "The ability to sustain transportation services, mitigate adverse economic impacts, meet societal needs, and move emergency relief personnel and commodities will hinge on effective transportation decisions at all levels." Transportation's unique role stems from the broad range of capabilities and responsibilities a transportation agency has: large and distributed workforces, easy access to heavy equipment and a robust communications infrastructure. To be ready for the agency's role, a comprehensive emergency management program must be in place within the agency.

As a part of their function, state DOTs are responsible for creating all-hazards plans and ensuring that employees have the ability to implement them. These all-hazards plans must conform with and complement the planning activities of the rest of the state's operations and agencies as well as those of regional authorities. DOTs may coordinate planning efforts with other state agencies, including the state's Emergency Management Agency; county highway departments; with various agencies of the U.S. Department of Transportation; and with DOTs from other states to ensure activities can be easily integrated when necessary. DOTs also need to plan to receive and use resources provided by other states and the federal government during operations. In conducting these activities, DOTs should consider applicable standards and best practices for incorporating risk and resilience into functions and systems.


Synopsis. The Comprehensive Preparedness Guide (CPG) provides for the development of local, state, tribal, territorial, and insular area emergency operations plans. FEMA released CPG 201 in 2012, with a Second Edition following in 2013. The First Edition of CPG 201 presented the basic steps of a Threat and Hazard Identification and Risk Assessment (THIRA) that included a process for identifying community-specific threats and hazards. It addressed setting capability targets for each core capability identified in the National Preparedness Goal; the Second Edition of CPG 201 included an estimation of resources needed to meet those capability targets. The Second Edition also included changes to the THIRA process, streamlining the number of steps to conduct a THIRA and providing additional examples.

THIRA Information Sheet


CPG 201 Supplement 1: THIRA Guide Toolkit

Information Sheet ESF #1 Transportation


Managing Catastrophic Transportation Emergencies: A Guide for Transportation Executives


Synopsis. This Guide provides guidance to new chief executive officers (CEOs) about the roles and actions that CEOs take during emergency events.

A Pre-Event Recovery Planning Guide For Transportation


Synopsis. This Guide discussed the impact that response can have on recovery, noting that the response efforts can mitigate the damages and consequences of an event, and potentially reduce the time to recovery, such as quickly assessing damage and removing debris. Some response decisions, such as where to put debris, can have an impact on both short-term and long-term recovery, as learned during the aftermath of Hurricane Katrina in New Orleans. Highlighting the differences between response and recovery, Report 753 also noted the importance of response and recovery team members understanding each other’s roles and responsibilities, because often the two functions overlap.


Synopsis. The U.S. Federal Highway Administration has released this report designed to help ensure that security and emergency management are considered during the planning phase of highway-related infrastructure projects.


Synopsis. This Guide supports development of a formal program for the improved management of traffic incidents, natural disasters, security events, and other emergencies on the highway system. It outlines a coordinated, performance-oriented, all-hazard approach called “Emergency Transportation Operations” (ETO). The guide focuses on an enhanced role for state departments of transportation as participants with the public safety community in an interagency process.
Using Highways During Evacuation Operations for Events with Advance Notice: Routes to Effective Evacuation Planning Primer Series


**Synopsis.** Evacuations may involve hundreds or hundreds of thousands of people. Regardless of the numbers, in each and every instance, the transportation network plays a key role in evacuating people out of harm’s way. Recognizing the unique challenges posed by the disaster environment on mobility and the safe and secure movement of people and goods, the U.S. Department of Transportation’s (DOT’s) Federal Highway Administration (FHWA) seeks to improve evacuation planning and implementation by bringing to the emergency management community new ways of better using the transportation network before and during evacuations. This document constitutes the first of a primer series entitled “Routes to Effective Evacuations.” This primer is intended as a tool to aid local and state planners to maximize the use of the highway network in the development and execution of evacuation plans for their communities, states or regions.

Final Report for the Application of Technology to Transportation Operations in Biohazard Situations


**Synopsis.** The U.S. Federal Highway Administration has released a report that examines the role of transportation agencies during a biohazard situation. The report is designed to help state and local transportation agencies perform the roles expected of them during all phases of a biohazard incident. According to the report, those roles can differ significantly from the ones they typically perform during other types of emergencies.

A Guide to Transportation’s Role in Public Health Disasters


**Synopsis.** This Guide examines development of transportation response options to an extreme event involving chemical, biological, or radiological agents. The report contains technical information on chemical, biological, and radiological threats, including vulnerabilities of the transportation system to these agents and consequence-minimization actions that may be taken within the transportation system in response to events that involve these agents. The report also includes a spreadsheet tool, called the Tracking Emergency Response Effects on Transportation (TERET), that is designed to assist transportation managers with recognition of mass-care transportation needs and identification and mitigation of potential transportation-related criticalities in essential services during extreme events. The report includes a user’s manual for TERET, as well as a PowerPoint slide introduction to chemical,
biological, and radiological threat agents designed as an executive-level communications tool based on summary information from the report.

**Simplified Guide to the Incident Command System for Transportation Professionals**


**Synopsis.** The purpose of this Simplified Guide is to introduce the ICS to stakeholders who may be called upon to provide specific expertise, assistance, or material during highway incidents but who may be largely unfamiliar with ICS organization and operations. These stakeholders include transportation agencies and companies involved in towing and recovery, as well as elected officials and government agency managers at all levels. This document may also be beneficial to public safety professionals, who are familiar with ICS but may not fully understand how ICS concepts are applicable to transportation agencies.

**Public Transportation Emergency Mobilization and Emergency Operations Guide**


**Synopsis.** This report examines activities that may be taken by public transportation agencies working with their local communities to promote the early recognition of emergency events, expedite response to emergency events, establish multi-agency coordination, and ensure that public transportation resources are available to support the response to an emergency event.

**Incorporating Security into the Transportation Planning Process**


**Synopsis.** This report examines the status, constraints, opportunities, and strategies for incorporating security into transportation planning at the state and metropolitan levels. The report also examines security-related projects in state and metropolitan priority programming decisions.

**Continuity of Operations (COOP) Planning Guidelines for Transportation Agencies**

Synopsis. The report is designed to assist transportation agencies in evaluating and modifying existing operations plans, policies, and procedures, as called for in the National Incident Management System. The planning guidelines in this report are supplemented online with downloadable worksheets, a template for a completed COOP plan, a series of brochures that can be used to explain the COOP planning process to staff, a draft PowerPoint presentation that may be customized and presented to transportation executive leadership, and more than 300 resource documents organized in an electronic COOP library.

FHWA Emergency Transportation Operations Website


The Office of Operations Emergency Transportation Operations (ETO) home page, features information on the ETO for Disasters, Traffic Planning for Special Events (PSE) and Traffic Incident Management (TIM) programs. The site provides tools, guidance, capacity building and good practices that aid local and State DOTs and their partners in their efforts to improve transportation network efficiency and public/responder safety when a non-recurring event either interrupts or overwhelms transportation operations. Non-recurring events may range from traffic incidents to traffic Planning for Special Event (PSE) to disaster or emergency transportation operations (Disaster ETO). Work in ETO program areas focuses on using highway operational tools to enhance mobility and motorist and responder safety.

Traffic Incident Management (TIM)

Traffic incident management (TIM) is a planned and coordinated program to detect and remove incidents and restore traffic capacity as safely and quickly as possible.

Traffic Incident Management Gap Analysis Primer

Available: [http://ops.fhwa.dot.gov/eto_tim_pse/about/tim.htm#t3](http://ops.fhwa.dot.gov/eto_tim_pse/about/tim.htm#t3)

Synopsis. This document provides guidance to federal, State and local TIM programs and their involved partners on the components needed to develop and sustain a successful full-fledged TIM program. The objectives of this primer are to:

- Identify and summarize the current state of TIM practice and activities at the national and State/local levels.
- Identify and summarize gaps found in TIM activities/information for national and State/local departments and agencies.
- Identify and outline a framework for achieving a complete TIM program for the different levels of government utilizing national guidelines.
- Outline the key elements that are contained in successful TIM programs.

The information contained within this document is geared towards multidisciplinary TIM stakeholders from both the public and private sectors. This includes but is not limited to personnel from transportation agencies, law enforcement, fire and rescue, emergency medical services (EMS), public safety communications, emergency management, towing and recovery, hazardous materials (HazMat), utilities, contractors, and traffic information media.
Making the Connection: Advancing Traffic Incident Management in Transportation Planning


**Synopsis.** The intent of this *primer* is to inform and guide traffic incident management (TIM) professionals and transportation planners to initiate and develop collaborative relationships and advance TIM programs through the metropolitan planning process. The primer aims to inspire planners and TIM professionals to create transportation plans and programs that support regional TIM programs through TIM-focused objectives, performance measures, and TIM strategies and projects. The ultimate goal of this primer is to strengthen, support, and elevate regional TIM programs as a crucial, lower-cost strategy for reliability, safety, environmental improvements, and mobility.

Senior Executive Transportation & Public Safety Summit Report


**Synopsis.** The 2012 Senior Executive Transportation & Public Safety Summit Report summarizes the proceedings, findings, and recommendations from a two-day Senior Executive Summit on Transportation and Public Safety, held June 26 and 27, 2012 at the United States Department of Transportation (USDOT) in Washington, D.C. This forum of senior-level, multi-disciplinary executives representing the transportation, law enforcement, fire and rescue, and emergency medical services communities addressed major challenges and innovative solutions in enhancing the state of the practice nationally in Traffic Incident Management (TIM). Secretary of Transportation Ray LaHood, Federal Highway Administration (FHWA) Deputy Administrator Greg Nadeau, and FHWA Executive Director Jeff Paniati provided opening remarks expressing the commitment of the entire Department to support safe, quick traffic incident response on the Nation’s roadways. Participants at the Summit discussed innovative practices in TIM policies, legislation, training and outreach. Summit highlights included discussions and presentations on the following issues: Improving responder and motorist safety and consistency among jurisdictions; Supporting TIM outreach initiatives and messaging; Enhancing State and local legislation and policies that advance TIM planning and operations, including Driver Removal and Authority Removal legislation; Supporting urgent and clearly-defined research strategies, such as model Move Over and Driver Removal laws, the effects of emergency lighting, and the impact of TIM performance measures; Implementing the National TIM Responder Training course developed through the Transportation Research Board’s Second Strategic Highway Research Program (SHRP 2); Improving the efficiency of the highway system through possible cost-recovery strategies, better investment of cost-efficient resources, and improved communication among responders about roles and responsibilities; and Developing an action-based executive group equipped to provide leadership, support, and guidance in advancing priority actions.
Analysis, Modeling, and Simulation for Traffic Incident Management Applications


Synopsis. Traffic incidents are a major source of congestion. Implementing traffic incident management (TIM) strategies has proven to be a highly cost effective way of reducing non-recurrent congestion. This publication provides the current state of practice of various analytical methodologies and related TIM applications. It, also, identifies some research activities to improve analysis of incident impacts and TIM strategies. This document provides a synthesis of analysis, modeling, and simulation (AMS) methods for incident impacts. The focus is on incidents effects on congestion and reliability as well as secondary incidents, for the purpose of estimating TIM benefits and evaluating programs and proposed strategies.

Traffic Incident Management Cost Management and Cost Recovery Primer


Synopsis. This publication provides mid-level managers at transportation and other stakeholder agencies with the resources they need to explain the benefits of traffic incident management (TIM) and TIM cost management and cost recovery to executive leadership. It also provides the same mid-level managers with information that will help them implement TIM cost management and cost recovery techniques. This document focuses on "recoverable costs" related to TIM, as there are costs associated with TIM that cannot accurately be measured or replaced; however, costs related to responder and motorist injury, disability, fatality, and the related medical and societal costs are not addressed here as those issues are addressed in a variety of ways in the existing literature.

Best Practices in Traffic Incident Management


Synopsis. This report describes task-specific and cross-cutting issues or challenges commonly encountered by TIM responders in the performance of their duties, and novel and/or effective strategies for overcoming these issues and challenges (i.e., best practices).

Field Operations Guide for Safety/Service Patrols


Synopsis. This guide was produced by the Federal Highway Administration and was developed for use by Safety/Service Patrol operators and supervisors. It is expected that Safety/Service Patrol personnel will carry the guide in their vehicle to use as a quick reference while performing patrol tasks. They should refer to this guide on a regular basis as a refresher on steps and tasks associated with managing incidents - particularly for those situations not encountered every day. This guide is not designed to stand alone, but in conjunction with training and exercises that will indoctrinate the Safety/Service
Traffic Incident Management Handbook


**Synopsis.** The Traffic Incident Management Handbook (TIM) (the Handbook or TIM Handbook) includes the latest advances in TIM programs and practices across the country, and offers practitioners insights into the latest innovations in TIM tools and technologies.

Emergency Vehicle Visibility and Conspicuity Report


**Synopsis.** The study report highlights the results of a U.S. Department of Justice - National Institute of Justice (NIJ) supported project intended to enhance emergency vehicle and roadway operations safety for firefighters, law enforcement officers, and other emergency responders. This report discusses best practices in emergency vehicle visibility and conspicuity, including cutting edge international efforts. It covers retroreflective striping and chevrons, high-visibility paint, built-in passive light, and other reflectors for law enforcement patrol vehicles, fire apparatus, ambulances and other EMS vehicles, and motorcycles.

National Preparedness and National Planning Frameworks

The federal government requires State DOTs to incorporate principles and concepts of national initiatives that provide common approaches to incident management and response in emergency response plans and operations. National initiatives include the National Response Framework (NRF) with its designated emergency support functions (ESFs) and the National Incident Management System (NIMS) with its protocols for multiagency interaction and communication. State and local NIMS compliance is a prerequisite for federal preparedness funds. The National Disaster Recovery Framework includes designated recovery support functions (RSFs).


**National Preparedness Goal, Second Edition – Information Sheet**


**Synopsis.** The 2011 National Preparedness Goal was updated in 2015. The key changes are described in the National Preparedness Goal, Second Edition – What’s New Fact Sheet. The National Preparedness Goal itself has not changed:
“A secure and resilient nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk.”

The following changes were made to the National Preparedness Goal document:

- **Introduction:** Language added to stress the importance of community preparedness and resilience.
- **Risk and the Core Capabilities:** Enhanced items on cybersecurity and climate change.
- **Preliminary Targets:** Updated preliminary targets.
- **New Core Capability:** A new core capability, Fire Management and Suppression, was added.
- **Core Capability Titles:** Revised the following core capability titles:
  - Threats and Hazard Identification (Mitigation) – revised to Threats and Hazards Identification;
  - Public and Private Services and Resources (Response) – revised to Logistics and Supply Chain Management;
  - Public Health and Medical Services (Response) – revised to Public Health, Healthcare, and Emergency Medical Services.
- **Core Capability Definitions:** Several of the core capability definitions were revised.

### Overview of the National Planning Frameworks (2013)


**National Planning Frameworks:**
- National Prevention Framework
- National Protection Framework
- National Mitigation Framework
- National Response Framework
- National Disaster Recovery Framework

### National Prevention Framework, Second Edition – Information Sheet


**Synopsis.** The National Prevention Framework focuses on terrorism and addresses the capabilities necessary to avoid, prevent, or stop imminent threats or attacks. Some core capabilities overlap with the Protection mission area.

The updates include edits to the Nation Preparedness Goal, and lessons learned. Other edits include:

“Updates to Coordinating Structure language on Joint Operations Centers and the Nationwide Suspicious Activity Reporting Initiative. Clarification on the relationship and differences between the Prevention and Protection mission areas. Updated language on the National Terrorism Advisory System.
(NTAS) as part of the Public Information and Warning core capability. Additional language on science and technology investments within the prevention mission area.”

**National Protection Framework, Second Edition – Information Sheet**


**Synopsis.** The National Protection Framework focuses on “actions to deter threats, reduce vulnerabilities, and minimize the consequences associated with an incident.”

The new Framework incorporates the edits to the National Preparedness Goal and new lessons learned. In addition, the following changes have been made:

“Updated Cybersecurity Core Capability Critical Tasks to align with the Mitigation, Response, and Recovery Mission Areas. Additional language on science and technology investments to protect against emerging vulnerabilities are included within the protection mission area. Additional language on interagency coordination within the protection mission area to support the decision-making processes outlined within the framework.”

**National Mitigation Framework, Second Edition – Information Sheet**


**Synopsis.** The National Mitigation Framework covers the capabilities necessary to reduce the loss of life and property by lessening the effects of disasters, and focuses on risk (understanding and reducing it), resilience (helping communities recover quickly and effectively after disasters), and a culture of preparedness.

The new Framework incorporates the edits to the National Preparedness Goal and new lessons learned including a revised core capability title, Threats and Hazards Identification. In addition, the following changes have been made:

“Additional language on science and technology efforts to reduce risk and analyze vulnerabilities within the mitigation mission area. Updates on the Mitigation Framework Leadership Group (MitFLG), which is now operational. Updates to the Community Resilience core capability definition to promote preparedness activities among individuals, households and families.”

**National Response Framework, Third Edition – Information Sheet**

Synopsis. The NRF is aligned with NIMS and provides capabilities to save lives, protect property, and meet basic human needs. Response activities occur before, during, and after an incident and can overlap with the start of Recovery activities.

The following changes were made to the Framework:

- The addition of a new core capability, Fire Management and Suppression.
- Three revised core capability titles
  - Logistics and Supply Chain Management;
  - On-scene Security, Protection, and Law Enforcement; and
- Three revised core capability definitions
  - Environmental Response/Health and Safety;
  - Fatality Management Services; and
  - Logistics and Supply Chain Management.


Synopsis. The National Disaster Recovery Framework describes "how the whole community works together to restore, redevelop, and revitalize the health, social, economic, natural, and environmental fabric of the community."

The new Framework incorporates the edits to the National Preparedness Goal and new lessons learned. Additional changes made to the Framework include "Increased focus on Recovery's relationship with the other four mission areas. Updated Recovery Support Functions (RSFs) to reflect changes in Primary Agencies and Supporting Organizations. Additional language on science and technology capabilities and investments for the rebuilding and recovery efforts."

Resilience

Resilience is "the ability to prepare and plan for, absorb, recover from and more successfully adapt to adverse events" (Disaster Resilience: A National Imperative, National Research Council 2012).

The National Infrastructure Advisory Council (NIAC), a presidential advisory council, conducted a study on resilience that was published under the title Critical Infrastructure Resilience, Final Report and Recommendations (2009). NIAC defines infrastructure resilience as the "ability to reduce the magnitude and/or duration of disruptive events".
In the context of transportation systems, increasing the resilience of transportation networks could include adaptations or elements that can be incorporated into the planning and design of specific asset types. For example, TRB Report 750: Strategic Issues Facing Transportation, Volume 2: Climate Change, Extreme Weather Events, And The Highway System: Practitioner's Guide And Research Report provided specific guidance on potential adaptations for bridges, culverts, storm water infrastructure, slopes/walls, and pavement in light of extreme weather events.

The most recent transportation reauthorization legislation, titled “Fixing America’s Surface Transportation Act” or the “FAST Act”, became public law on December 4, 2015 and includes, in SEC. 1201. Metropolitan Transportation Planning, an addition to Title 23 US Code Section 23 requiring MPOs to consider investments that “improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation.”

**Disaster Resilience: A National Imperative**


**Synopsis.** Resilience is defined in this report as “the ability to prepare and plan for, absorb, recover from and more successfully adapt to adverse events.” It provides a discussion of how to increase the nation’s resilience to disasters through a vision of the characteristics of a resilient nation in the year 2030.

**Systems Resilience and Climate Change**


**Synopsis.** This edition of TRB’s *Transportation Research Record* includes 18 papers that examine resilience and climate change issues related to transportation:

- Roadmaps for Adaptation Measures of Transportation to Climate Change.
- Resilience Versus Risk: Assessing Cost of Climate Change Adaptation to California’s Transportation System and the City of Sacramento, California.
- Barriers to Implementation of Climate Adaptation Frameworks by State Departments of Transportation.
- Resilience of Coastal Transportation Networks Faced with Extreme Climatic Events
- Analysis of Transportation Network Vulnerability Under Flooding Disasters
- Vulnerability Evaluation of Logistics Transportation Networks Under Seismic Disasters
- Integrating Stochastic Failure of Road Network and Road Recovery Strategy into Planning of Goods Distribution After a Large-Scale Earthquake
- Multimodal Transit Connectivity for Flexibility in Extreme Events
- Risk and Resilience Analysis for Emergency Projects
- Unmanned Aircraft Systems Used for Disaster Management
- Multimodal Evacuation Simulation and Scenario Analysis in Dense Urban Area: Philadelphia, Pennsylvania, Case Study
• Joint Evacuation and Emergency Traffic Management Model with Consideration of Emergency Response Needs
• Supporting Mobility-Impaired Populations in Emergency Evacuations
• Agent-Based Evacuation Model Considering Field Effects and Government Advice
• Selecting Four-Leg Intersections for Crossing Elimination in Evacuations
• Using Dynamic Flashing Yellow for Traffic Signal Control Under Emergency Evacuation
• Hurricane Evacuation Route Choice of Major Bridges in Miami Beach, Florida

Resilience: Key Products and Projects


Synopsis. Updated monthly, this presentation is a slideshow summary of the Transportation Research transportation security and resilience activities. These cross the main areas of TRB inquiry (freight, transit, highways and airports).

Fundamental Capabilities of Effective All Hazards Infrastructure Protection, Resilience and Emergency Management for State DOTs


Synopsis. A Guide prepared to assist State DOTs understand the fundamentals of preventing incidents within their control, protect transportation users, supporting other responders, recover from incidents and evaluate responses. It also introduces concepts supporting resilience programs. This is an update to the 2007 publication Fundamentals of Effective All-Hazards Security Management for State DOTs.

Integrating Hazard Mitigation and Comprehensive Planning Workshop


Synopsis. The workshop emphasized the important relationship between land use planning and hazard mitigation, noting that how we design, build, and regulate our communities impacts their ability to withstand hazards.

Increasing National Resilience to Hazards and Disasters

Citation. Increasing National Resilience to Hazards and Disasters, Committee on Science, Engineering and Public Policy, the National Academies of Sciences, Engineering and Medicine. Available: http://sites.nationalacademies.org/PGA/COSEPUP/nationalresilience/index.htm

Synopsis. The ad hoc committee conducted a study and issued a consensus report that integrates information from the natural, physical, technical, economic and social sciences to identify ways in which to increase national resilience to hazards and disasters in the United States.

The ad hoc committee report:
• Defines "national resilience" and frames the primary issues related to increasing national resilience to hazards and disasters in the United States.
• Provides goals, baseline conditions, or performance metrics for resilience at the U.S. national level.
• Describes the state of knowledge about resilience to hazards and disasters in the United States.
• Outlines additional information or data and gaps and obstacles to action that need to be addressed in order to increase resilience to hazards and disasters in the United States.
• Presents conclusions and recommendations about what approaches are needed to elevate national resilience to hazards and disasters in the United States.

Crisis Response and Disaster Resilience 2030: Forging Strategic Action in an Age of Uncertainty, Progress Report Highlighting the 2010-2011 Insights of the Strategic Foresight Initiative, FEMA, January 2012


Synopsis. The Federal Emergency Management Agency (FEMA) established the Strategic Foresight Initiative (SFI) that has brought together a wide cross-section of the emergency management community to explore key future issues, trends and other factors, and to work through their implications. This report presents the findings from foresight efforts thus far, including: uncertainties that define and drive the future environment; strategic needs and gaps our community will have to address; a look into the emergency management community of 2030; and finally, suggested next steps for the community to prepare for the future. The strategic needs in particular – grouped into Essential Capabilities, Innovative Models and Tools, and Dynamic Partnerships – are intended as a catalyst for leaders throughout the emergency management community to prepare themselves and the Nation for the challenges and opportunities the future holds.

Building Resilient States: A Framework for Agencies


Synopsis. Smart Growth America's State Resilience Program offers resources, tools, and ideas for state leaders and agencies to build more resilient places and reduce the risk of natural hazards to human life and investments. Drawing on the work of pioneering state leaders, federal agencies, and national experts, this program represents the cutting edge of land use and engagement strategies for hazard resilience. Materials are based on the experience of peer agencies from across the country, the latest research on programs and activities that states control, and proven approaches for building municipal partnerships.

Community And Regional Resilience: Perspectives From Hazards, Disasters, And Emergency Management
Citation. Susan L. Cutter, Lindsey Barnes, Melissa Berry, Christopher Burton, Elijah Evans, Eric Tate, and Jennifer Webb, Hazards and Vulnerability Research Institute, University of South Carolina. Community And Regional Resilience: Perspectives From Hazards, Disasters, And Emergency Management, 2008. Available: 

Synopsis. Hazards and disaster research provides a fertile field and rich tradition in both the conceptual understanding of hazards vulnerability and community resilience in the face of disasters and the empirical place-based evidence to support geographic and temporal variability in community vulnerability and resilience. Drawing from the social sciences, natural sciences, and engineering, hazards and disasters scholars and practitioners have enabled a richer understanding of the impacts of hazards and disasters on places and the requisite monitoring required for the effective implementation of vulnerability reduction and resilience enhancing public policies. The NOAA salons also emphasized that geographic scale and unit of analysis are critical components in developing resilience metrics, especially given the underlying questions of resilience to what and for whom.

The development and actual deployment of coastal resilience indicators is still in the nascent stage, but there is considerable local, state, regional, and national interest in such measures. The desire is to create the equivalent of “an index of leading resilience indicators” for the nation— indicators that combine the best science and practice that are available. While we are not there yet, the perspectives from the hazards, disasters, and emergency management communities show considerable promise and illuminate the path forward.

Resource Guide on Resilience


Synopsis. IRGC developed a web-based resource guide on resilience for researchers and practitioners. The resource guide available on this page is a collection of authored pieces that review existing concepts, approaches and illustrations or case-studies for comparing, contrasting and integrating risk and resilience, and for developing resilience. Most papers focus also on the idea of measuring resilience. Although this idea may not sound right to some, there are on-going efforts for evaluating resilience, developing resilience indicators, and measuring the effectiveness of actions taken to build resilience. These efforts are worth considering because indicators and metrics for resilience are needed to trigger interest and investment from decision-makers.

This guide is designed to help scientists and practitioners working on risk governance and resilience evaluation. It stresses the importance of including resilience building in the process of governing risk, including in research, policy, strategies, and practices. It emphasizes the need to develop metrics and quantitative approaches for resilience assessment and instruments for resilience management.

A Multidimensional Review of Resilience: Resources, Processes, and Outcomes

Synopsis. This paper reviews a sampling of resilience literature from a variety of disciplines and identifies at least three dimensions of resilience: resources, processes, and outcome priorities.

Critical Infrastructure Resilience


Synopsis. The Infrastructure Resilience Analysis Methodology (IRAM) provides a comprehensive framework for analyzing and managing critical infrastructure resilience (Biringer, Vugrin, & Warren, 2013). The IRAM is a hybrid methodology that includes performance-based metrics to quantify resilience and resilience attributes to inform analysis and improvement. The IRAM quantifies resilience with two primary sets of metrics: systemic impact (SI) and total recovery effort (TRE).

Resilience: Approaches to Risk Analysis and Governance: An introduction to the IRGC Resource Guide on Resilience


Synopsis. This paper includes (I) a comparison of risk and resilience management strategies, (II) a description of common features within resilience analysis and thinking, and (III) a discussion of the benefits that resilience management brings to the field of risk management. This paper serves as a general introduction to the concept and application of resilience, specifically as it relates to traditional risk management, and in particular about suggestions for metrics or indicators that can be developed to assess resilience in a system, and the performance of resilience strategies.

Measuring the Resilience of Infrastructure Systems


Synopsis. This paper defines resilience – meaning both what it is and what aspects of the system must be measured – and understanding why resilience is being measured.

Planning for a More Resilient Future: A Guide to Regional Approaches


Synopsis. This report summarizes the rapidly-growing body of research on resilience, describing the main ideas that are driving policy and practice across the country, and examining current thinking on regional and economic resilience. It is accompanied by an online guide to resources on the practice of resilience, available at www.nado.org. The guide includes examples of ways to approach planning for resilience, a primer on the expansive federal policy framework which determines the priorities for funding resilience initiatives, and describes the current state of philanthropic engagement in resilience efforts.
Enhancing Community Resilience: Practical Resources in Addressing the Collaboration Gaps


Synopsis. This paper examines Community Resilience (CR), with particular reference to the “collaboration gap” and the manner in which it impedes the unification of communities and responding professionals in terms of reacting to the effects of an adverse event (disaster relief). The purpose of this paper is to highlight the impact of the “collaboration gap” and to then present resources which may enable communities and responding professionals to react together in order to mitigate and recover from the effects of an adverse event, thereby enhancing the resilience of communities.

Resilience Planning in Transportation

A Resiliency Framework for Planning in State Transportation Agencies


Synopsis. This thesis presents a framework for resiliency planning in state departments of transportation and other transportation agencies. The development of this framework is motivated by the need for more resilient transportation systems, due to the increasing frequency and the effect both natural and man-made catastrophic disasters have on transportation systems. The resiliency framework is based on the urban transportation planning framework and is thus applied in the broader context of general transportation planning. The resiliency framework is then applied in a preliminary review to three statewide transportation plans to show the resiliency deficiencies of those plans and how the framework may be applied to increase resiliency. These plans are selected from three different states with diversity of locations and without any preconceived notions about their incorporation of resiliency in their planning process. This preliminary review reveals a reactive nature towards investments that increase an agency’s resilience. This may be attributed to the problem of limited funding for transportation investments, as well as, limited knowledge by the transportation agencies about the return on such resiliency investments, mostly due to the uncertainty associated with the occurrence of catastrophic disasters, especially the predictability of weather-related events. However, post-disaster transportation system overhauls provide enough evidence for the need for more systemic ways of addressing resiliency in planning processes.

Improving the Resiliency of Transit Systems Threatened by Natural Disasters


Synopsis. The objectives of this research are to develop (1) a handbook with an associated suite of digital presentation materials to address planning principles, guidelines (including metrics), strategies, tools, and techniques to enable public transit systems to become more resilient to natural disasters and climatic events; and (2) a draft recommended practice for public transit resilience to natural disasters and climatic events suitable as input to the APTA Standards Program. The handbook and its associated
suite of digital presentation materials should be appropriately designed for use by public transit agency executive staff to plan, budget, and institutionalize effective practices to improve resilience, addressing (a) capital project planning and asset management (including financial planning and risk assessment for natural disasters and climatic events), (b) operations and maintenance, and (c) administration. They should provide sufficient detail to allow users to adapt them to their individual entities.

**Federal and Transit Agencies Taking Steps to Build Transit Systems’ Resilience but Face Challenges**


**Synopsis.** This report examines (1) how DHS and DOT help transit agencies make their systems resilient; (2) actions selected transit agencies take to make their systems resilient; and (3) challenges transit agencies face with making their systems resilient. GAO examined documentation and interviewed officials from DHS and DOT, and officials from nine transit and five emergency management agencies. GAO selected a non-generalizable sample of agencies in five locations, chosen for transit ridership volume and variation in geography, types of risks, and transit modes.

**FloodCast: A Framework for Enhanced Flood Event Decision Making for Transportation Resilience**


**Synopsis.** The objectives of this research are to develop a strategic framework and a prototype tool for enhanced flood event decision making. The framework and tool should help state DOTs plan, manage risks, mitigate hazards, and respond to flood and flash flood events. The framework and tool should address not only immediate flood impacts, but also cascading, escalating impacts. Given the large amount and diversity of applicable data and tools, the framework design should be flexible and scalable to accommodate the available data sets and allow users to easily share both data and products with other users, thereby fostering collaboration across government organizations and the private sector.

**Guidelines to Incorporate the Costs and Benefits of Adaptation Measures in Preparation for Extreme Weather Events and Climate Change**


**Synopsis.** The objectives of this research are to develop (a) a stand-alone document providing guidance for practitioners on methods and tools, including illustrative case studies where applicable, to: (i) efficiently mine, manage, and document existing data sources; (ii) acquire and use data from new and innovative sources; and (iii) apply, and communicate the results from, a flexible and scalable framework for analyzing the costs and benefits of adaptation measures in preparation for extreme weather events and climate change conducted by various transportation organizations; (b) a final report that documents the entire research effort and includes the research team’s recommendation of research needs and priorities for additional related research; and (c) an updated PowerPoint presentation describing the research and results suitable (upon revision) for posting on the TRB website.

**The Innovative DOT: A Handbook of Policy and Practice**

Synopsis. This Handbook, developed by the State Smart Transportation Initiative and Smart Growth America, contains a resiliency section that provides guidance for state departments of transportation (DOTs) on how to incorporate climate change adaptation into long-range transportation planning. It provides state DOTs with a comprehensive list of reforms that will address potential climate-related vulnerabilities and reduce the likelihood, magnitude, duration and cost of disruption associated with extreme weather. The resiliency section, entitled "Incorporate Climate Change Resilience into Long-Range Planning," is included into the larger handbook, which provides general guidance to state DOTs on ways to improve their transportation systems.

The resiliency section summarizes the potential effects of climate change on a state’s transportation system, describes how climate change adaptation planning can help a state protect its transportation assets, and outlines steps state DOTs can take to assess vulnerability and identify and implement changes to improve the system’s resilience.

The section reviews the effects of climate change and the impact extreme weather can have on a state’s transportation assets. For example, the increased intensity, variability, duration, and frequency of weather events could lead to shortened infrastructure lifespans, increased risk of catastrophic failures, and increased costs. It provides guidance for state DOTs on ways to implement resilience in transportation systems through operational and infrastructure changes. There are three key adaptation planning steps that state DOTs can take to assess system vulnerability and risks, and identify and implement changes to improve the system’s resilience. These steps include: (1) documenting environmental changes and selecting the most appropriate climate models to predict future conditions; (2) identifying climate change-related stressors and their impacts on the transportation system, and inventorying transportation assets, focusing on characteristics that could help or hinder adaptation; and (3) developing and assessing alternative strategies for adapting infrastructure and operations.

The handbook also highlights FHWA-sponsored pilot projects for incorporating resilience into transportation planning. These pilots were intended to encourage state and regional agencies in the development of climate adaptation plans using FHWA’s Climate Change and Extreme Weather Vulnerability Assessment Framework. Three of the states that conducted pilot projects (Washington, California, and Massachusetts) are featured in the handbook as case studies. Washington completed the vulnerability and risk assessment step by identifying at-risk transportation assets and planning to further develop a set of specific adaptation strategies for the assets. California has begun developing and selecting strategies for transportation infrastructure, and has developed guidance to assist MPOs and regional transportation planning agencies with assessing their vulnerability and incorporating climate adaptation into the development of their regional plans. Massachusetts committed funding to address climate impacts according to recommendations made in the state’s 2011 Climate Change Adaptation Report, which included recommendations for improving transportation facilities’ preparedness for extreme weather events.

The handbook was commissioned by the U.S. DOT’s Federal Highway Administration to assist state DOTs with prioritizing reforms by offering strategies that can be undertaken to improve a state’s transportation system.

NY Metropolitan Transportation Council, Resilience Planning, Plan 2040
Citation. NY Metropolitan Transportation Council Transportation Plan 2040. Available: https://www.nymtc.org/Regional-Planning-Activities/Resiliency-Planning

Synopsis. Improving the resiliency of the transportation system was included in Plan 2040’s regional goals. The Plan include various strategies for climate adaptation throughout the entire transportation system and stresses the importance of collaboration between all member agencies in planning for future severe weather events. Greater resiliency will mitigate the adverse impacts of disruptions on the movement of people and goods due to weather, climate, or other acts of nature.

The following outcomes are associated with the regional resiliency goal:

- Adaptation measures for critical components of the transportation system to accommodate variable and unexpected conditions without catastrophic failure;
- Greater resiliency of the regional supply chain by identifying options for goods movement during and after events;
- Cooperative partnerships with federal, state, local agencies, and other stakeholders to adapt the transportation system and improve recovery from disruptions.

Transportation Sector Resilience, Final Report and Recommendations


Synopsis. The President directed the National Infrastructure Advisory Council (NIAC) to examine the resilience of the Nation’s transportation sector to determine potential gaps and identify opportunities for the Federal Government to improve the sector’s resilience and security. Throughout this study, infrastructure resilience is defined as the ability to reduce the magnitude or duration of disruptive events that is accomplished by anticipating, absorbing, adapting to, or rapidly recovering from the disruption.

The Council’s key findings are presented within three major topic areas:

Finding 1: Understanding Systemic Risks
- Transportation risks are not well understood across modes, regions, and critical interdependent sectors, creating uncertainty about national-level consequences that could arise from a major system disruption.
- Owners and operators have limited visibility of risks across adjoining systems, jurisdictions, modes and critical dependent infrastructures. In particular, emerging risks related to cyber disruptions.

Finding 2: Incorporating Resilience into Operational Practice
- Although national resilience policies are generally well established, they have not yet been integrated into comprehensive national transportation plans and strategies that coordinate decision making and risk management across modes at local, state, regional, and national levels.
- Gaps in leadership, coordination, and workforce capabilities have made it difficult for organizations to effectively incorporate resilience as an embedded function of good operating practice.
There is no structured senior-level engagement between public and private sectors partners, and among transport modes and interdependent sectors, to address national-level transportation risks.

Finding 3: Investing in Resilient Infrastructure

- Chronic underinvestment in transportation infrastructure and the inability to monetize resilience for investment decisions have prevented resilience from being integrated into the built infrastructure.
- There is no national consensus on the need for investment in resilient transportation infrastructure due in part to a limited understanding among the public, political leaders, and industry leaders about the role and value of resilience.
- Uncertainty over the likelihood, costs, and consequences of emerging risks makes it difficult for owners and operators to invest in long-term resilience.

There are three overarching recommendations: the need to 1) baseline current risks and establish a Federal vision for transportation resilience; 2) develop the analytic tools, models, and exercises to better understand and plan for emerging risks and interdependencies; and 3) use the results of these efforts to operationalize resilience by increasing funding and implementing effective Federal practices, procedures, and procurement processes.

Resiliency Metrics for Transportation Planning


Synopsis. One of Caltrans' strategic objectives is to attain a more resilient and integrated transportation system, and this Preliminary Investigation sought information to support that goal. Caltrans is particularly interested in information to support development of a resiliency score or other metric that the department can use to prioritize projects based on expected resiliency and adaptability to change. Caltrans has a stated initial interest in three types of resiliency: climate, system and financial. The agency is also interested in learning what types of vulnerabilities are addressed in resiliency efforts across the United States and internationally.

Adapting Bridge Infrastructure To Climate Change: Institutionalizing Resilience In Intergovernmental Transportation Planning Processes In The Northeastern USA.

Citation. Anna Schulz, Asim Zia, Christopher Koliba


Synopsis. Multi-level governance networks provide both opportunities and challenges to mainstream climate change adaptation due to their routine decision-making and coordination processes. This paper explores institutionalizing resilience and adaptation to climate change in the intergovernmental transportation planning processes that address bridge infrastructure in the Northeastern United States
(USA), specifically in Vermont and Maine. The research presented here relies on nine interviews with policy-makers and planners, a survey of transportation project prioritization criteria, development of a longitudinal bridge funding database, and its integration with publicly available geospatial data. It presents a novel spatial analysis methodology, a modified version of which could be adopted by transportation agencies for prioritizing scarce adaptation funds. Although transportation agencies are undertaking a variety of mitigation activities to address business-as-usual needs, climate change adaptation and resilience efforts remain underprioritized. Adaptation is a global concern, but impacts vary dramatically between regions and require localized solutions. Bridges and culverts, which are especially vulnerable to climate-induced flooding impacts, have complex maintenance and design processes and are subject to convoluted adaptation planning procedures. Critical gaps in resources and knowledge are barriers to improved adaptation planning. Restructuring the transportation project prioritization procedures used by planning organizations to explicitly include adaptation may provide a novel strategy to institutionalize resilience in transportation. These procedures must be considered in the context of the intergovernmental networks that exist to support transportation infrastructure. Although these networks will likely vary across countries, the approaches introduced here to study and address transportation infrastructure adaptation may be applied to many settings.

State Agency Chiefs Break Down Issues Facing DOTs in CEO Roundtable Panels


Synopsis. California DOT Director Malcolm Dougherty moderated a panel discussion on resiliency and the ways in which state DOTs are planning for and responding to changes in climate and extreme weather events. His panelists were Pennsylvania DOT Director Leslie Richards, Delaware Transportation Secretary Jennifer Cohan and Colorado DOT Executive Director Shailen Bhatt. All described recent severe weather events that had damaged their transportation networks.

“I think it is fair to say that every state has had its share of adverse events,” said Dougherty, whose state recently suffered severe flooding, mudslides and fires.

“That is what we’re betting on right now . . . what I’m certain of is that we’re going to get more of this,” said Bhatt, who also talked about the severe mountain flooding that washed out many roads and rail tracks in Colorado during September 2013.

Richards said that in Pennsylvania, one of the nation’s most flood-prone states, officials recently commissioned the state’s first resiliency study. She said plans need to include educational campaigns and public outreach.

While most states face severe weather events, Delaware also sees challenges from rising sea levels as Cohan said her state has the nation’s lowest mean elevation with dikes and levees already protecting lands. She said resilience planning needs to focus not only on what can be protected, but also on what should be protected and at what cost. “This is an extremely passionate issue in Delaware,” said Cohan. She noted that her department is vacating its first road this year due to rising sea levels. “We have to start somewhere and this was the logical first step.”

Port Resilience Planning in the Port of New York and New Jersey
Citation. Dr. Tiffany Smythe, Principal Investigator, Center for Maritime Policy and Strategy
U.S. Coast Guard Academy, New London, CT. Port Resilience Planning in the Port of New York and New Jersey. Available: http://www.cga.edu/WorkArea/DownloadAsset.aspx?id%3D5050&usg=AFQjCNE6Ipl3dloEf8szZxBwQzi1TWr4ng&sig2=_ysxkmx4Y1TOU8rFr8m1BQ&bvm=bv.134495766,d.eWE06320

Synopsis. The purpose of this academic study is to examine resilience planning in the Port of NY and NJ with the goal of helping port, emergency management, and planning professionals to enhance the value of their ongoing port resilience planning work. While the concept of “resilience” to coastal storms and other natural hazards is increasingly used in public discourse, little social science research has been done to examine the application of this concept within the context of ports and to learn from the practitioners who are doing this work. This study is focused on two questions: (1) What do practitioners envision as a resilient port and how do they prioritize among the range of near-term and long-term resiliency considerations? and (2) Who is involved in coastal storm, port resilience, and climate change adaptation planning, and in what ways do individuals collaborate across planning networks, jurisdictions, agencies, and sectors to accomplish this work?

Increasing Transportation Resilience in the Gulf Coast


Synopsis. The study identified innovative approaches for using climate data in transportation vulnerability assessments, consistent strategies for evaluating vulnerability and adaptation options, and tools and resources that can assist other transportation agencies in conducting similar assessments.

Resilience Plans – State Examples

Vermont’s Roadmap to Resilience

Vermont is now working to develop an integrated, long-term strategy for resilience – one that weaves together state, regional and local initiatives, and better equips the state to prepare for, respond to and bounce back from future climate impacts and the natural disasters that we know will come. The Resilient Vermont project is a stakeholder-driven process to identify practical steps to reduce our vulnerabilities and minimize the risks to our citizens, our communities, our economy and our environment.

NY State Community Resilience

This document includes an overview of requirements and activities in resilience in NY state.
Iowa State Freight Plan

http://www.iowadot.gov/iowainmotion/freight.html

The Iowa DOT has embarked on numerous freight planning activities to help achieve this objective, many of which will be detailed in the Iowa Freight Plan. This plan is a way to connect all of these initiatives and allow them to move forward towards a common goal of optimal freight transportation in the state. In addition, the plan will guide Iowa DOT’s investment decisions to maintain and improve the freight transportation system, and ultimately strengthen the state’s economy and raise the quality of life for its citizens.

Oregon Resilience Plan: Reducing Risk and Improving Recovery for the Next Cascadia Earthquake and Tsunami, 2013


Oregon Resilience Plan set out to help Oregonians know what to expect from the state’s infrastructure should that disaster strike this year, and to propose the level of infrastructure reliability that a resilient state should provide. The plan’s recommendations highlight ways to close the gap that separates expected and desired performance.

The Transportation Task Group (Chapter Five) assessed the seismic integrity of Oregon’s multi-modal transportation system, including bridges and highways, rail, airports, water ports, and public transit systems, examined the special considerations pertaining to the Columbia and Willamette River navigation channels, and characterized the work deemed necessary to restore and maintain transportation lifelines after a Cascadia earthquake and tsunami. The group’s scope included interdependence of transportation networks with other lifeline systems.

Texas State Freight Resiliency Plan


The Texas Department of Transportation’s (TxDOT) recognized that the highway system is a major component of a resilient freight network. As the managing organization responsible for maintaining the State’s highways, TxDOT developed this plan to provide a comprehensive framework for identifying key freight infrastructure corridors and strategies to ensure a resilient freight transportation network in the State of Texas.

Resilience Plans – Transportation Specific Examples

2060 Florida Transportation Plan


http://www.dot.state.fl.us/planning/ftp/
The "2060 Florida Transportation Plan" provides transportation planning guidance for the state, and includes emergency preparedness and resilience planning in its long-range objectives. The Plan, developed by the Florida Department of Transportation (FDOT), sets high-level transportation objectives for the state, and offers implementation strategies to meet those objectives.

The Plan articulates two long-range objectives related to climate change resiliency: improving Florida's ability to use the transportation system to respond to emergency and security risks and increasing the resilience of state's critical infrastructure to the impacts of climate trends and events. The Plan offers several strategies to improve the state's ability to respond to emergency risks, calling on the FDOT to:

- Implement a comprehensive approach for enhancing transportation security and emergency management through developing and regularly updating statewide and regional emergency response plans to define roles and strategies related to preparedness, prevention, detection, protection, response, recovery, and mitigation;
- Support emergency evacuation, response, and post-disaster recovery activities through transportation planning and management decisions; and
- Increase the use of technology to improve transportation safety, security, and emergency management, including public sector actions to develop standards and adapt infrastructure to facilitate vehicle, communications, and related technology investments.

In addition to emergency management, the Plan also recognizes the need for system owners to identify where the risk for service interruptions will be greatest from the impacts of climate change. To reduce vulnerability and increase resilience, the Plan calls for the development of more refined data and decision-making tools to help decision-makers integrate climate trends and their potential impacts into decisions about the design, construction, maintenance, and operation of transportation infrastructure. All objectives and implementation strategies in the Plan are nonbinding.

In 2015-2016, FDOT updated the Florida Transportation Plan; the Vision Element and the Policy Element of the FTP were released in August and December 2015, respectively, and Strategic Intermodal System Policy Plan was completed in February 2016. The new plan establishes a vision to shift focus from maintaining infrastructure to adapting infrastructure, which includes making it resilient to impacts of extreme weather events, climate trends, and sea-level rise. The FTP Policy Element includes goals and objectives designed to guide the state towards this and other aspects of the overall vision for the state’s transportation system. To support the goal of adapting infrastructure and increasing resilience, the Policy Element recommends incorporating extreme weather risks into long-range planning, project development, design, and operations and maintenance; and continuing to support research to better understand impacts of extreme weather and climate trends on transportation infrastructure.

**Illinois' State Long Range Transportation Plan**


Includes Resilience goal - "ensure infrastructure is prepared to withstand and sustain hazards and extreme events"

**Oregon Bridge Resilience Plan**

Slides:

Presentation:

https://arameetings.webex.com/mw3100/mywebex/nbrshared.do

**NYSDOT Climate Change Resiliency Efforts**


**Mass MBTA Winter Resiliency Plan**


**California Transportation Sector Plan**

http://resources.ca.gov/docs/climate/safeguarding/Transportation%20Sector%20Plan.pdf

Safeguarding California: Reducing Climate Risk (Safeguarding California), details several recommended actions to enhance the state’s transportation system’s resiliency to climate impacts and improve its ability to provide access to places, goods, and services. This implementation plan builds on the foundation provided by Safeguarding California by describing climate-related vulnerabilities of the transportation sector, outlining current activities, identifying next steps, and proposing monitoring and evaluation metrics.
D. Stakeholders – Regional Collaboration

National Incident Management System (NIMS)


The National Incident Management System (NIMS) is a systematic, proactive approach to guide departments and agencies at all levels of government, nongovernmental organizations, and the private sector to work together seamlessly and manage incidents involving all threats and hazards—regardless of cause, size, location, or complexity—in order to reduce loss of life, property and harm to the environment. NIMS is the essential foundation to the National Preparedness System (NPS) and provides the template for the management of incidents and operations in support of all five National Planning Frameworks.

NIMS updates since the 2010 Guide was published provided important new definitions, policy direction and guidance explaining: (1) the NIMS relationship to the National Preparedness Framework; (2) additions to cover Intelligence and cyber issues; (3) support, coordination, collaboration, and command and management tactical and non-tactical operations; (4) use and interoperability of Emergency Communications; and (5) inclusion of “whole community” concepts in the NIMS. The NIMS 2016 refresh retains key concepts and principles from earlier NIMS versions while incorporating new Presidential directives, legislative changes, and lessons learned from exercises, actual incidents, and planned events. The NIMS refresh:

• Reiterates concepts and principles of the original 2004 version and the updated 2008 version;
• Reflects and incorporates lessons learned from exercises, real world incidents, and policy updates, such as the National Preparedness System, and NIMS-related guidance, including the 2013 NIMS Intelligence/Investigation Function Guidance and Field Operations Guide;
• Reflects progress in resource typing and mutual aid and builds a foundation for the development of a national qualification system;
• Clarifies that NIMS is more than just the Incident Command System (ICS) and that it applies to all stakeholders with roles in incident management across all five mission areas (Prevention, Protection, Mitigation, Response, and Recovery);
• Explains the relationship among ICS, the Center Management System (CMS) for operations centers and coordination centers, and Multiagency Coordination Groups (MAC Groups); and
• Enhances information management processes to improve data collection plans, social media integration, and the use of geographic information systems (GIS).

A Guide To Regional Transportation Planning For Disasters, Emergencies And Extreme Events


Synopsis. The Guide uses foundational planning principles, case studies, tips, and tools to explain implementation of transportation planning for possible multijurisdictional disasters, emergencies, and other major events. In addition to the guide, there is a contractor’s final research report and a PowerPoint presentation describing the entire project.
Information-Sharing Guidebook For Transportation Management Centers, Emergency Operations Centers, And Fusion Centers (2010)


Synopsis. This guidebook provides an overview of the mission and functions of transportation management centers, emergency operations centers, and fusion centers. The guidebook focuses on the types of information these centers produce and manage and how the sharing of such information among the centers can be beneficial to both the day-to-day and emergency operations of all the centers. Challenges exist to the ability to share information, and the guidebook addresses these challenges and options for handling them. The guidebook also provides some lessons learned and best practices identified from a literature search and interviews/site visits with center operators.

Role Of Transportation Management Centers In Emergency Operations Guidebook (2012)


Synopsis. This Guidebook explores ways to increase communication, collaboration, and cooperation between transportation management centers (TMCs) and emergency response agencies. The document addresses both technical and institutional barriers that prevent TMCs from fully supporting emergency operations and provides specific activities and practices such as joint planning and training activities for TMCs to become more effective in emergency operations.

Communication With Vulnerable Populations: A Transportation And Emergency Management Toolkit


Synopsis. The Toolkit describes how to create a communication process to reach vulnerable populations regarding their transportation options in emergencies. The toolkit provides a guiding framework and tools for constructing a scalable, adaptable communication process built on a network of agencies from public, private, and nonprofit sectors. Together, these partners will form interconnected communication channels with the ability to carry out the function of emergency communication not necessarily possible by working alone.
A Guidebook For Successful Communication, Cooperation, And Coordination Strategies Between Transportation Agencies And Tribal Communities


**Synopsis.** This Guidebook includes guidelines designed to help departments of transportation and tribal communities work together to achieve successful transportation projects on tribal lands. The report explores a wide range of issues and topics to be considered and offers a flexible approach that can be adapted to most situations. The report also includes case studies to illustrate successful practices.

The report on the project that led to the development of NCHRP Report 690 was published as NCHRP Web-Only Document 171.

Uses Of Social Media In Public Transportation


**Synopsis.** This report explores the use of social media among transit agencies and documents successful practices in the United States and Canada. For the purposes of the report, social media are defined as a group of web-based applications that encourage users to interact with one another, such as blogs, Facebook, LinkedIn, Twitter, YouTube, Flickr, Foursquare, and MySpace. An eReader friendly PDF version of TCRP Synthesis 99 is also available.

Expanding Role of Public Works in Emergency Management


**Synopsis.** This paper examines the evolving mission of public works in emergency management.

Maintenance and operations personnel of state DOTs and public works agencies are vital in the response and recovery phases of disasters and other emergencies, and assist with rescue, evacuation, and sheltering and provide temporary traffic control, perimeter security, animal control, transportation of supplies and equipment, on-site vehicle service, debris management, and restoration of infrastructure.

The convergence of all-hazards emergency management and traffic incident management in recent years means that public works has a different role in planning and preparing for and responding to disasters and events. The profusion of laws, mandates, and programs and the rapidly evolving body of training and knowledge can make staying abreast of these changes overwhelming.
E. Emergency Management Training

National Incident Management System (NIMS) Training

Available: [http://training.fema.gov/is/nims.aspx](http://training.fema.gov/is/nims.aspx)

NIMS ICS All-Hazards Position Specific Training Program Official Website


The National Incident Management System (NIMS) is a systematic, proactive approach to guide departments and agencies at all levels of government, nongovernmental organizations, and the private sector to work together seamlessly and manage incidents involving all threats and hazards—regardless of cause, size, location, or complexity—in order to reduce loss of life, property and harm to the environment. NIMS is the essential foundation to the National Preparedness System (NPS) and provides the template for the management of incidents and operations in support of all five National Planning Frameworks.

NIMS updates since the 2010 Guide was published provided important new definitions, policy direction and guidance explaining: (1) the NIMS relationship to the National Preparedness Framework; (2) additions to cover Intelligence and cyber issues; (3) support, coordination, collaboration, and command and management tactical and non-tactical operations; (4) use and interoperability of Emergency Communications; and (5) inclusion of “whole community” concepts in the NIMS.

The following NIMS and ICS courses are highlighted on the NIMS training page:

**ICS and NIMS Courses**

- ICS-100: Introduction to the Incident Command System
- ICS-200: ICS for Single Resources and Initial Action Incidents
- ICS-300: Intermediate ICS for Expanding Incidents
- ICS-400: Advanced ICS for Command and General Staff
- IS-700: National Incident Management System, An Introduction
- IS-701: NIMS Multiagency Coordination System (MACS)
- IS-702: NIMS Publication Information Systems
- IS-703: NIMS Resource Management
- IS-704: NIMS Communication and Information Management (unavailable)
- IS-706: NIMS Intrastate Mutual Aid – An Introduction
- IS-800: National Response Framework, An Introduction
- G-191: Incident Command System/ Emergency Operations Center Interface*
- G-402 Incident Command System (ICS) Overview for Executives/Senior Officials*
- G-775: Emergency Operations Center (EOC) Management and Operations*

*G191, G402, and G-775 are coordinated by local Emergency Management Agencies.
All-Hazards Position Specific Courses

- E/L 950: All-Hazards Position Specific Incident Commander
- E/L 952: All-Hazards Position Specific Public Information Officer
- E/L 954: All-Hazards Position Specific Safety Officer
- E/L 956: All-Hazards Position Specific Liaison Officer
- E/L 958: All-Hazards Position Specific Operations Section Chief
- E/L 960: All-Hazards Position Specific Division/Group Supervisor
- E/L 962: All-Hazards Position Specific Planning Section Chief
- E/L 964: All-Hazards Position Specific Situation Unit Leader
- E/L 965: All-Hazards Position Specific Resources Unit Leader
- E/L 967: All-Hazards Position Specific Logistics Section Chief
- E/L 969: All-Hazards Position Specific Communications Unit Leader
- E/L 970: All-Hazards Position Specific Supply Unit Leader
- E/L 971: All-Hazards Position Specific Facilities Unit Leader
- E/L 973: All-Hazards Position Specific Finance/Admin. Section Chief
- E/L 975: All-Hazards Position Specific Finance/Admin. Unit Leader Course
- E/L 984: Task Force/Strike Team Leader
- E/L 986: Air Support Group Supervisor
- E/L 987: Introduction to Air Operations

Contact information for State or Territorial Emergency Management Agencies can be found at https://training.fema.gov/programs/aps/stolist.aspx

FEMA Emergency Management Institute (EMI)


As noted on the FEMA EMI website, FEMA EMI is located in Emmitsburg, Maryland on the campus of the National Emergency Training Center (NETC) and trains more than 2 million annually through onsite and offsite training and partnerships with emergency management training systems, colleges, universities; and technology-based mediums.

EMI supports implementation of National Incident Management System (NIMS), the National Response Framework (NRF), the National Disaster Recovery Framework (NDRF), and the National Preparedness Goal (NPG) and is “the emergency management community’s flagship training institution, and provides training to Federal, State, local, tribal, volunteer, public, and private sector officials to strengthen emergency management core competencies for professional, career-long training.”

Courses offered by EMI include the following:

- IS-100: Introduction to the Incident Command System
- IS-200: ICS for Single Resources and Initial Action Incidents
• ICS-300: Intermediate ICS for Expanding Incidents
• ICS-400: Advanced ICS
• IS-552: The Public Works Role in Emergency Management
• IS-554: Emergency Planning for Public Works
• IS-556: Damage Assessment for Public Works
• IS-558: Public Works and Disaster Recovery
• IS-559: Local Damage Assessment
• IS-632: Introduction to Debris Operations
• IS-700: Introduction to the National Incident Management System
• IS-701.a: NIMS Multiagency Coordination System (MACS)
• IS-703.a: NIMS Resource Management
• IS-706: NIMS Intrastate Mutual Aid—An Introduction
• IS-800: Introduction to the National Response Framework

Note that IS stands for Independent Study. Independent Study courses are offered online and are free of charge. They include interactive quizzes and a final exam; a certificate will be issued to the student upon successful completion of the exam.

Links can also be found on the FEMA EMI website to FEMA Independent Study (IS) Program and an online searchable catalog, the National Training and Education Directorate (NTED) which offers courses focused on helping responders function in mass consequence events and to the DHS Center for Domestic Preparedness (CDP) which focuses on delivering WMD training. Other FEMA resources that can be accessed via the website include: FEMA NIMS Training Program webpage, FMA ICS Training Program and Resource Center, FEMA National Response Framework (NRF) Resources, and the FEMA National Fire Academy.

**Traffic Incident Management (TIM) Training**

Available:  
http://www.fhwa.dot.gov/goshrp2/solutions/all/l12_l32/national_traffic_incident_management_responder_training_program

**National Exercise Program (NEP)**


The NEP is a component of the National Preparedness System and allows the examination and validation of federal and whole community's core capabilities, and indicates national progress towards the National Preparedness Goal.

More specifically, the NEP’s purpose is “to design, coordinate, conduct, and evaluate exercises that rigorously test the Nation's ability to perform missions and functions that prevent, protect against, respond to, recover from, and mitigate all hazards.” Each Program cycle is a two-year, progressive schedule of exercises of various types that are selected based on their support to the Goal, and principal objectives.

The website also provides a link to the NEP document dated March, 2011.
FEMA.gov Exercise Webpage
Available: www.fema.gov/exercise

FEMA’s exercise webpage describes the National Exercise Program (NEP), the Homeland Security Exercise and Evaluation Program (HSEEP) which is used by NEP, the National Exercise and Simulation Center (NESC) which links planning, training, exercise, and response personnel with modeling and simulation capabilities. The webpage also describes the Radiological Emergency Preparedness (REP) Program and the Chemical Stockpile Emergency Preparedness Program (CSEPP) Program Exercises.

Emergency Management Professional Program (EMPP)
Available: http://training.fema.gov/empp/

FEMA’s Emergency Management Institute (EMI) established an Emergency Management Professional Program (EMPP). The EMPP is a framework for acquiring the knowledge, skills, and abilities to enter and progress through the Emergency Management field. The EMPP includes three academies:

- National Emergency Management Basic Academy – focus is on foundational knowledge and skills
- National Emergency Management Advanced Academy (formerly the Leaders Academy) – focus is on Advanced Concepts and Issues in Emergency Management; Advanced Leadership & Management; Critical Thinking and Complex Problem Solving
- National Emergency Management Executive Academy - Strategic Leadership and Critical Thinking

FEMA contacts for the programs are provided on this webpage.

Emergency Management Performance Grant (EMPG) FY 2016 Program Requirements

DHS Notice of Funding Opportunity (NOFO) Fiscal Year 2016 Emergency Management Performance Grant Program (EMPG)
Available: https://www.fema.gov/media-library-data/1455571902574-a84f5a1b2f450795a70ccee1f5ee7b967/FY_2016_EMPG_NOFO_FINAL.pdf

EMPG funded activities include updating emergency plans, conducting training, and designing and conducting exercises to validate core capabilities, maintain current capabilities, and enhance capability for high-priority core capabilities with low capability levels. EMPG recipients and subrecipients are expected to address capability targets and gaps identified through the annual THIRA and SPR process. EMPG program recipients are also required to develop a Multiyear Training and Exercise Plan (TEP) addressing THIRA risks and exercising/validating THIRA capability requirements in a progressive manner.

Recipients should develop and maintain a progressive exercise program and a multiyear Training and Exercise Plan consistent with HSEEP. EMPG Program funds related to training should support NIMS implementation and emphasize NIMS Training Program core competencies. NIMS Training - Independent Study (IS) 100, IS 200, IS 700, and IS 800 are required for EMPG funded personnel. In
addition, they are required to complete either the courses in the Professional Development Series or the National Emergency Management Basic Academy.

Exercise required include no less than four quarterly exercises (i.e., one EMPG-funded exercise and/or an exercise that includes EMPG-funded personnel per quarter) of any type and one full-scale exercise within a 12-month period. The exercises should increase in complexity and have common program priorities. In addition, EMPG-funded personnel are required to participate in no fewer than three exercises in a 12-month period.

Allowable training- and exercise-related costs are described in the document and in Appendix B, and include the establishment, support, conduct, and training attendance.

The Work Plan in Appendix C includes a Program and Budget Narrative, Personnel Data Table, Training Data Table, Exercise Data Table, and Grant Activities Outline.

**Emergency Management Accreditation Program (EMAP).** September 2012, EMAP Lexington, Kentucky.


The *Emergency Management Standard* by EMAP is the set of 64 standards by which programs that apply for EMAP accreditation are evaluated. The Emergency Management Standard is designed as a tool for continuous improvement as part of the voluntary accreditation process for local and state emergency management programs.

The *Emergency Management Standard* covers:

- Program Management
- Administration and Finance
- Laws and Authorities
- Hazard Identification, Risk Assessment and Consequence Analysis
- Hazard Mitigation
- Prevention
- Operational Planning
- Incident Management
- Resource Management and Logistics
- Mutual Aid
- Communications and Warning
- Operations and Procedures
- Facilities
- Training
- Exercises, Evaluations and Corrective Action
- Crisis Communications, Public Education and Information

**Emergency Management Standard**
The Emergency Management Standard establishes the minimum acceptable performance criteria for an Emergency Management Program and intends that the standard be fair and equitable for all who choose to adopt it.

Users of the standard are also mentioned in Chapter 1 as being Emergency Management Programs seeking EMAP Accreditation and those seeking a self-assessment standard for their Emergency Management Program. The document notes that there is a three-year review cycle for the standard.

Program elements of an accredited Emergency Management Program are discussed and described in the standard. Training is described in section 4.13. According to the document, a training program should include “the assessment, development and implementation of appropriate training for Program officials, emergency management response personnel and the public.”

The key elements of a training program include:

- Training needs assessment, curriculum, course evaluations, and records of training.
- Training for emergency personnel consistent with their current and potential responsibilities, including specialized training related to the threats facing the jurisdiction.
- Regularly scheduled training “based on the training needs assessment, internal and external requirements, and mandates (i.e. NIMS) and addresses deficiencies identified in the corrective action process.”
- Maintenance of appropriate training records
- Exercises, Evaluations and Corrective Actions are described in section 4.14. According to the document, an accredited Emergency Management Program should have an exercise, evaluation and corrective action process.

The key elements include:

- A documented exercise program that “regularly tests the skills, abilities, and experience of emergency personnel as well as the plans, policies, procedures, equipment, and facilities of the Emergency Management Program” and is tailored to the jurisdiction's hazards.
- The Emergency Management Program “shall evaluate plans, procedures, and capabilities through periodic reviews, testing, post-incident reports, lessons learned, performance evaluations, exercises, and real-world events.”
- A process for corrective actions to prioritize and track the resolution of deficiencies in real world and exercise events, and to revise relevant plans.
FHWA SHRP2 Solutions: Training for safer, faster, stronger, more integrated incident response.

National Traffic Incident Management Responder Training Program


The Second Strategic Highway Research Program (SHRP 2) has developed a multi-disciplinary and interjurisdictional training program for TIM. The SHRP2 training program, National TIM Responder Training Program, meets the challenge of “faster clearance and improved safety” for both motorists and responders, and is endorsed by the International Association of Chiefs of Police, the International Association of Fire Chiefs, and the National Volunteer Fire Council. The program incorporates effective practices and standards, and was developed through the second Strategic Highway Research Program (SHRP2). The program is available at no cost from the National Highway Institute (NHI) in two forms – a four-hour in-person training which promotes interaction among police, firefighters, DOT, medical personnel, and other incident responders and a four-hour, web-based version, FHWA-NHI-133126.

Various resources (fact sheets, brochures, communications toolkit, train-the-trainer course overview) are available for download on this website.

National TIM Responder Training Program Frequently Asked Questions (FAQs)


Synopsis. The FAQs describes the training program as a "national curriculum developed by responders for responders." It also notes that there is a Train-the-Trainer course for participants who would like to become a trainer.

Traffic incident management is described as "the process of coordinating the resources of a number of different public and private sector partners to detect, respond to, and clear traffic incidents as quickly as possible to reduce the duration and impacts of incidents, while protecting the safety of on-scene responders and the traveling public."

AASHTO National Traffic Incident Management Coalition

Available: http://ntimc.transportation.org/Pages/ObjectivesandStrategies.aspx

This AASHTO website provides links to numerous TIM publications, brochures, videos, and training resources.

National Highway Institute (NHI) Training


TIM-related Courses include the following: The National Highway Institute offers courses relevant to TIM. These courses include National Traffic Incident Management Responder Training (133126) course, Design and Operation of Work Zone Traffic Control, Work Zone Traffic Control for Maintenance Operations, Flagger Training, Successful Traffic Signal Management, Advanced Work Zone Management and Design, Principles of Evacuation Planning Tutorial, and Managing Travel for Planned Special Events.
Protection of Transportation Infrastructure from Cyber Attacks: A Primer


Synopsis. This Primer describes the key cybersecurity training principles and highlights the importance of cybersecurity culture in the chapter on Training. The Primer makes the case for creating a robust cybersecurity culture by noting that people are essential to building a cybersecurity culture and are also the most vulnerable element in protecting an agency’s cyber assets.

The key concepts and information introduced in this chapter are based on NIST training resources along with the following references: APTA Recommended Practices Part 2, The Transportation Roadmap (August, 2012), the Cybersecurity Framework (February 12, 2014), and the Homeland Security Workforce Assessment Act signed into law December, 2014. The legislation requires DHS to create a strategy “to enhance the readiness, capacity, training, recruitment and retention of its cybersecurity workforce.”

The Primer also refers to the Federal Information Security Modernization Act (2014) governing federal IT and cybersecurity and requires role-based training for federal personnel and other users of federal IT systems. While this Act’s focus is on federal personnel, the guidance which will be provided based on this Act should be of interest to transportation agencies. Therefore, according to the Primer, much focus needs to be placed by senior management on culture-building initiatives including awareness and training.

The Primer also presents NIST’s cybersecurity learning continuum model in which learning progresses from security awareness to cybersecurity essentials to role-based training to education and/or experience.

The Training chapter also describes Functions and User categories, awareness content and resources, training content and resources, evaluation techniques, performance indicators, and the importance of continuous improvement. With respect to Delivery methods, the use of Interactive training techniques, technologies, shared resource models, and interagency and interjurisdictional activities are discussed.

Transportation System Management & Operations (TSM&O) Workforce Development White Papers

Three White Papers were developed as a result of the NOCoE Workforce Development Summit on June 22-23, 2016.

- The first paper provides general background and context regarding TSM&O as a program activity and TSM&O staffing within transportation agencies and the private sector.
- The second paper addresses the needed staff competencies and related education and training.
- The third White Paper focuses on TSM&O workforce recruitment, retention and professional career development.

White Paper No. 2: Competencies, Education and Training
Synopsis. The second White Paper describes the TSM&O workforce characteristics, key positions, and the size and nature of the workforce development problem.

The White Paper presents a competencies matrix by function (Exhibit 1) and a training resources table (Exhibit 2) showing available resources by function. The categories of functions includes:

- Sr. Policy, Strategic Management
- Sr. Program Management
- Mid-level Program Management
- Program Planners
- System Engineering and Related Technical Specialties
- Mid-level Project Management
- Field Staff

In addition, the White Paper estimates training demand for each of these functions and how they may be met. Exhibit 3 presents training available by source and level.

White Paper No. 3: Recruitment, Retention and Career Development, National Operations Center of Excellence


The third White Paper is based on a May, 2016 survey of the AASHTO TSM&O Subcommittee members and Operations Academy graduates regarding TSM&O recruitment and retention. The top two issues of the 34 responding agencies were lack of existing training vs. emerging needs and the lack of a clear career path. Other key findings included:

- "Most agencies have retained a level staffing or increased slightly, perhaps reflecting continuing overall state DOT staffing restrictions.
- Most states appear to be having some difficulty filling key technical positions – especially in systems engineering, IT and ITS device maintenance – and approximately half were significantly dependent on consultants
- About one-half of responses indicated that new hires were generally knowledgeable in one or more specific TSMO topic areas (e.g., traffic signals) with the other half with little knowledge. None indicated that their new hires were TSM&O savvy.
- Difficulties in recruitment related to salary competition and/or lack of required skills/certifications."

Exploring the Role and Adoption of Technology-Based Training and Employment Services

Synopsis. As part of the US Department of Labor’s national initiative to explore the role and adoption of technology-based learning (TBL) within the public workforce, descriptive information about TBL use at the state and local levels of the workforce system was collected through an online survey of state workforce agency administrators and executive directors of Local Workforce Investment Boards.

Factors regarding the adoption of TBL included:

- Development of infrastructure through new investments and leveraging existing resources.
- Integration of personal support through design components or tutoring or mentoring.
- Use of a digital “on-ramp” which is attentive to participants’ levels of technological literacy.
- Active promotion and marketing of TBL.
- Commitment to technical assistance.

Curriculum for New State DOT Transit Grant Managers in Administering Federal and State Transit Grants


Synopsis. The curriculum is organized into modules and submodules appropriate for state transit staff.

Module topics include:

- Introduction to FTA grants
- Legal authority & annual certifications
- Grant administration
- Financial management
- Project management & grantee oversight
- Planning
- Procurement
- Asset management
- Safety & security
- Subrecipient personnel-related issues
- Subrecipient service requirements & restrictions
- Training & technical assistance
- Safety & Security

In the description of the Safety & Security module, it is noted that Section 5329, MAP-21 (49 USC 5329) provides FTA with the authority to establish a national transit safety framework, requires DOT to establish a national transit safety plan which includes safety performance criteria and standards and a Safety Certification Training Program for federal and state workers, contractors who conduct oversight, and transit workers responsible for safety oversight, and requires FTA funding recipients to create an agency safety plan and certify it meets FTA requirements. Up to 0.5% of Section 5307 or 5311 funds can be used to fund transit worker training in the Safety Certification Training Program.
Training & Technical Assistance

The key concepts in this module include FTA requirements for states. States are required to:

- Inform subrecipients of federal requirements and provide technical assistance to meet the requirements
- Subrecipients are required to train their own staff in several topic areas including:
  - Safety
  - ADA
  - Drug & Alcohol
- FTA requires states to certify that they have well-trained and well-informed staff when carrying out proposed projects
- States need to provide training to potential subrecipient applicants for applicants serving predominantly minority populations
- FTA’s Rural Transportation Assistance Program (RTAP) funds subrecipient training and technical assistance. States have RTAPs that conduct state-sponsored training and offer training scholarships, and provide technical assistance.

Additional FTA-funded training programs noted in this module include:

- Transportation Safety Institute (TSI)
- National Transit Institute (NTI)
- National RTAP
- National Center on Senior Transportation (NCST)
- Easter Seals Project Action (ESPA)

Additional recommended resources include:

- Community Transportation Association of America (CTAA)
- American Public Transportation Association (APTA)

Attracting, Recruiting, and Retaining Skilled Staff for Transportation System Operations and Management


Synopsis. The report helps transportation agencies recruit and retain qualified professional staff in Systems Operation and Management (SOM). Findings are based on an analysis of SOM career paths, skill requirements, and training needs to identify successful programs, state-of-the-art initiatives, and best industry practices.

For the core job function of Real-time Operations, competencies were grouped into

• "Operations Strategies – Maintenance of the capacity and safety of highways by controlling traffic, responding to incidents, clearing snow and other obstructions, and providing information to users on highway conditions and alternatives.
• Systems and Technology – Knowledge and understanding of the department’s operating systems as well as the technology required to carry out real-time operations.
• Safety – Focus on crash avoidance by enhancing driver performance, including advanced collision avoidance systems and the automated highway system.
• Security – Precautions taken to guard against the danger, risk, or safety threats of major highways. Management of Real-Time Operations Systems – The integration of key activities to ensure real-time monitoring of the traffic and travel conditions of major highways and sharing that information to improve transportation system security; address congestion; improve response to emergencies, weather events, and surface transportation incidents; and facilitate national and regional highway traveler information." (page 21)

Exhibit 28 provides an Overview of Strategic SOM Workforce Recommendations by Career Stage. For entry-level or new SOM workers, mentoring programs are recommended. Pages 106-108 describe the steps necessary to implement a mentoring program.

**TCRP F-Series Reports**

The F-series publications provide an excellent source of training literature focused primarily on the transit industry. In particular TCRP Report 162 - Building a Sustainable Workforce in the Public Transportation Industry – A Systems Approach, 2013 provides information on eleven training and development strategies and implementation steps along with sample programs implemented at specific agencies and Professional Capacity Building strategies that can complement an agency’s training initiatives.

**Washington State Transportation Training Coalition**


The Washington State Transportation Training Coalition is a collaboration of transit, highway, university and insurance. According to the site, Washington State Transit Insurance Pool (WSTIP) in partnership with WSDOT, Washington State Transit Association, Community Transportation Association of the Northwest, and Eastern Washington University Tribal Technical Assistance Program comprises the coalition. The Training Coalition coordinates approximately 20 training events each year at various locations throughout the state.

**Southern California Regional Transit Training Consortium**

Available: [http://www.scrttc.com](http://www.scrttc.com)

The Southern California Regional Transit Training Consortium (SCRTTC), through its network of Community Colleges, Universities, Transit Agencies, Public and Private Organizations develop and deliver training to transit workforce. The SCRTTC also assists them in finding appropriate employment within the transit industry.
NCHRP Web-Only Document 215: Incident Command System (ICS) Training for Field-Level Supervisors and Staff


Synopsis. According to its page on TRB’s web site, this publication “provides training materials and guidance for transportation field personnel to help their organizations operate safely in an emergency or traffic management event. This course is intended to review the basic ICS structures and terminologies aimed to ensure safety, personnel accountability, and support for the agency’s financial reimbursement efforts. The product includes lesson plans, guidance on classroom set-up, complete slide shows with scripts or instructor prompts, instructions for creating materials, and some information about training for adults. Specifically, the materials include:

1. A video presentation with voice-over
2. An Instructor Guide and Student Course Evaluation
3. An Instructor Guide and Student Evaluation
4. Discussion-Based Training Scenarios
5. ICS Quick Start Cards
6. A Supervisor’s Folder

The TRB web page for this publication continues, “The course material provided in this project assumes that instructors have completed classes on delivering training to adults, have certificates in at least ICS 100, 200 and 300, and have some experience with ICS, at the field level or in an Emergency Operations Center (EOC). It is also assumed that instructors may have had experience working with a transportation agency in emergency planning or training, or as a field supervisor, and to have also completed ICS 400 and E/L449 ICS "Incident Command System Curricula TTT” courses."

The report itself consists of twelve chapters. Chapter 1 discusses how to use the Instructor Guide. Chapter 2 discusses how the course and pilot programs were developed, and revealed the results of interviews and surveys providing feedback from pilot program participants. The Lesson Plans are in Chapter 3. Chapters 4 and 5 include the materials for Module 1, Chapters 6 and 7 the materials for Briefing Training, and Chapters 8 and 9 the materials for the Discussion-Based Scenarios. Chapter 10 consists of the ICS Quick Start Cards and accompanying instructions. Chapter 11 describes the materials in the Supervisor’s Folder. The report concludes in Chapter 12 with references related to the Incident Command System (ICS) and the Traffic Incident Management System (TIMS).

Homeland Security Exercise and Evaluation Program (HSEEP)


Synopsis. The Homeland Security Exercise and Evaluation Program (HSEEP) provides a set of guiding principles for exercise programs, as well as a common approach to exercise program management, design and development, conduct, evaluation, and improvement planning. HSEEP exercise and evaluation doctrine is flexible, adaptable, and is for use by stakeholders across the whole community
and is applicable for exercises across all mission areas – prevention, protection, mitigation, response, and recovery.

The HSEEP document is organized in the following manner:

- **Chapter 1: HSEEP Fundamentals** describes the basic principles and methodology of HSEEP.
- **Chapter 2: Exercise Program Management** provides guidance for conducting a Training and Exercise Planning Workshop (TEPW) and developing a Multi-year Training and Exercise Plan (TEP).
- **Chapter 3: Exercise Design and Development** describes the methodology for developing exercise objectives, conducting planning meetings, developing exercise documentation, and planning for exercise logistics, control, and evaluation.
- **Chapter 4: Exercise Conduct** provides guidance on setup, exercise play, and wrap-up activities.
- **Chapter 5: Evaluation** provides the approach to exercise evaluation planning and conduct through data collection, analysis, and development of an AAR.
- **Chapter 6: Improvement Planning** addresses corrective actions identified in the exercise IP and the process of tracking corrective actions to resolution.

Fundamental principles for exercise programs and individual exercises include the following:

- They should be guided by Elected and Appointed Officials.
- They are capability-based and objective driven. Exercises evaluate performance against capability-based objectives based on the National Preparedness Goal's series of core capabilities.
- A progressive planning approach with an increasing level of complexity over time should be used.
- Whole community integration should take place throughout the exercise planning and execution process.
- HSEEP’s common methodology for exercises should be used so that diverse organizations can readily collaborate and have a shared understanding.
- Exercises should be informed by risk.

Key elements of HSEEP’s approach to exercise program management include:

- Engaging Elected and Appointed Officials to Provide Intent and Direction.
- Developing a Multi-year Training and Exercise Plan and Establishing Multi-year Exercise Program Priorities. These priorities inform the development of individual exercise objectives, ensuring coordinated and integrated.
- Using a Progressive Approach. Which builds toward an increasing level of complexity over time.
- Maintaining a Rolling Summary of Exercise Outcomes. A rolling summary report provides elected and appointed officials and other stakeholders with an analysis of issues, trends, and key outcomes from all exercises conducted as part of the exercise program.
Managing Exercise Program Resources. An effective exercise program utilizes the full range of available resources for exercise budgets, program staffing, and other resources.

Phases of the Exercises Cycle

The exercise cycle phases described in HSEEP include:

- Design and Development
- Conduct
- Evaluation
- Improvement Planning

Design and Development:

Exercise planning team members determine exercise objectives and design the scenario, and ensure that they are aligned with the overall multiyear plan. They also engage with key officials, state EMA, and other stakeholders; create documentation and the exercise plan; and, coordinate logistics. Safety of exercise participants is a key aspect of the exercise logistics.

Exercise design and development steps include: “• Setting the exercise foundation by reviewing elected and appointed officials’ guidance, the TEP, and other factors; • Selecting participants for an exercise planning team and developing an exercise planning timeline with milestones; • Developing exercise-specific objectives and identifying core capabilities based on the guidance of elected and appointed officials; • Identifying evaluation requirements; • Developing the exercise scenario; • Creating documentation; • Coordinating logistics; and • Planning for exercise control and evaluation.”

Design: The core components include establishing the scope, objectives, scenario, documentation, and media and public relations guidance.

Objectives: Generally, planners should select a reasonable number of specific, measurable, achievable, relevant, and time-bound (SMART) exercise objectives.

Regarding the planning teams and reporting structure, a sample planning team structure and recommendations regarding organizational structure are provided in HSEEP:

- Planning team structure: The team can be structured according to a ICS-type structure with the Exercise Planning Team Leader in the Commander position. Operations develops and evaluates the scenario. Planning develops/compiles all documentation and may be responsible for any simulated actions by absent positions/agencies necessary for the exercise. Logistics elements include service such as transportation, signage, food, medical, and security and support such as communications and supplies. Administration/Finance Section provides financial and administrative support.
- The importance of understanding the exercise objectives and identifying core capabilities associated with each objective, and designing the exercise and evaluation plan around the capabilities to be tested are emphasized in HSEEP.
- Training and Exercise Planning Workshop (TEPW): TEPWs, based on guidance from officials, establish exercise program strategy and structure, and set priorities and a multi-year schedule of training and exercise. TEPWs encourage efficiency, effectiveness, and coordination of exercise initiatives. TEPW participants are diverse and include elected and appointed officials, persons...
with administrative responsibility and those in relevant disciplines, and representatives from relevant NGOs or social support organizations. They review and take into account jurisdiction-specific threats and hazards from THIRA and risk assessments, AAR results, regulations and other external requirements.

Conduct:

Conduct-related activities include preparing for exercise play, managing exercise play, and conducting immediate exercise wrap-up activities. Conduct techniques for Discussion-based exercises and Operations-based exercises are presented in this section. Participant roles and responsibilities are also described in HSEEP, Table 4.1.

Evaluation:

Evaluation compares performance of exercise teams, individuals, equipment, protocols, systems, and plans against objectives. The evaluation section includes information on planning, exercise documentation and analysis, identification of strengths and improvement areas, and development of AARs. Evaluation planning begins at the start of exercise design and development. Exercise evaluation guides (EEGs) are designed to streamline data collection, and facilitate assessment of core capabilities, objectives, capability targets and critical tasks in a consistent manner.

Improvement Planning:

Improvement planning identifies improvements based on corrective actions revealed during the exercise. The improvement planning results are included in or appended to the AAR. Improvements may include changes to plans, procedures, organizational structures, processes, equipment or other resources, training. Individual corrective actions should be monitored until they have been implemented.

Interactive Training for All-Hazards Emergency Planning, Preparation, and Response for Maintenance and Operations Field Personnel


Synopsis. The genesis of this Synthesis was the increasing challenges facing state DOT’s and public works agencies:

- State DOTs and public works agencies are being challenged with expanding roles in all-hazards emergencies and increasing public expectation of safe and secure transportation infrastructure and quick restoration of public services.

The Synthesis also stresses the importance of Maintenance and Operations personnel of DOTs, tribal, and local public works agencies with respect to emergency preparedness and response. Their preparedness is critical to public safety as they are frontline personnel during emergencies and disasters. They are usually first on the scene and the last to leave.

This Synthesis Report identifies interactive emergency training tools and sources that may be applied by maintenance and operations field personnel of state departments of transportation and public works agencies. The report also identifies potential obstacles to their implementation and develops a toolkit of
relevant training and exercise information. The target audience of the Synthesis was the managers of M&O field personnel.

Chapter 1 introduces NIMS, the importance of training and exercises and their place in the Preparedness Cycle, the Emergency Operations Plan and other plans and procedural documents. Chapter 2 describes emergency training and exercise needs of M&O field personnel including NIMS, TIM, federal directives, mutual aid and grants, winter maintenance and operations, evacuation, continuity of operations, supervisor training, and exercises.

Chapter 3 covers the following emergency training and exercise delivery methods:

- Field Crew Meetings
- Just-in-Time Training
- Interjurisdictional and Interagency Training and Exercises
- Joint Training
- Asynchronous Training
- Train-the-Trainer
- Planned Events, Incidents, and Exercises
- Computer-Assisted Simulations
- Classroom Training
- Online Training with Live Instructors
- Blended Training
- Exercises

Chapter 4 on emergency training and exercise practices discusses implementation challenges, training needs and solutions, findings on the use of exercises and additional findings.

Challenges: Key challenges were scheduling difficulties and limited budgets. Additional challenges included lack of qualified training staff, personnel turnover, distance issues, senior management issues, inadequate facilities and other resources, insufficient information about available training, and infrequent need for training.

Interactive Solutions: For adult learners whose motivation is problem-centered, interactive training is ideal. The interactive solutions identified in the Synthesis included both Synchronous methods and Asynchronous methods. Synchronous methods require a live instructor and take place at a fixed time. Participants are able to interact with the instructor and with each other through the web or in-person. Asynchronous methods, however, are more flexible and can take place according to the learner’s schedule and pace. It can also be less costly than synchronous training. Table 30 presents Implementation Issues and Possible Solutions.

Additional findings included: Peer-to-Peer Training, Field Training, In-House Training, Professional Organizations and Certifications, and Other Training.

Findings on Use of Exercises included: Discussion-based exercises, Operations-based exercises, exercise evaluation, exercise scenarios, training and exercises for PWs, training and exercises for contractors, and law enforcement and fire departments.
Chapter 5 described the development of the Toolkit which presents key courses and catalogs, guidance documents, source organizations, and source-specific information.

Chapter 6 presented the conclusion to the Synthesis and a summary of the key findings and further research needs.

The Appendices include:


Toolkit: The purpose of the Toolkit was to provide all-hazards emergency training resources including source organizations, key courses and course catalogs guidance documents were presented in an Excel spreadsheet, were interactive to varying extents, and encompassed a variety of delivery methods. “Variety of delivery met were those organizations that were a source of emergency operations and hazards awareness training and exercises, and included:

1. Federal (FEMA)
2. Federal (other DHS)
3. Federal (U.S.DOT)
4. Federal (other federal departments, administrations, agencies, etc)
5. State
6. Local
7. University/college
8. Associations and coalitions
9. Private firm.

Incorporating Transportation Security Awareness Into Routine State Dot Operations And Training


Synopsis. This Report outlines techniques to integrate all-hazards security awareness concepts and reminders into routine state department of transportation (DOT) operations, maintenance, and training. The Report is structured as follows:

Section 1 - introduces transportation security and role of state DOTs

Section 2 – presents organizational readiness and five key “Questions to Ask” before implementation of a security awareness program
Section 3 – identifies components of a security awareness campaign including general messages and delivery methods

Section 4 – provides relatively inexpensive methods to promote security awareness

Appendices

Appendix A – Overview of current training and resources

Appendix B – Contact list of transportation security training organizations

Appendix C – Directory of transportation security resources

The Report notes that many DOTs may believe security is not DOT business. However, because transportation systems are vulnerable to various hazards and threats, DOTs play a significant role in infrastructure security and have the responsibility of controlling access to critical components, coordinating with law enforcement to ensure quick response, conducting risk and vulnerability assessments, and taking action to address the effects of risks and vulnerabilities. Hence, security awareness is important for all employees and is the cornerstone of a security culture in which security is an integral part of daily routine.

The Report states that all transportation employees contribute to security by being vigilant and detecting suspicious activity, and by deterring unlawful acts simply by their presence. The Report also notes that all employees should also understand the risks to transportation systems and assets, know how to recognize a security risk, what to do and what to do, and how to report a security threat. Section 3, Figure 1 provides a security reporting procedures flowchart used by Texas DOT.

Training sources described in Appendix A and B include: DHS/TSA, TRB, NTI, CTSSR, FHWA, NHI, FTA, FMCSA, PHMSA, FEMA, LTAP/TTAP, Other federal training, SEMA, RDPC, Other sector resources, and Other security resources.

Security awareness programs described in Appendix C include If You See Something, Say Something™, First Observer™, Highway Watch, and Transit Watch.

Guidelines For Transportation Emergency Training Exercises


Synopsis. The report is designed to assist transportation agencies in developing drills and exercises in alignment with the National Incident Management System. The report describes the process of emergency exercise development, implementation, and evaluation. In addition, the available literature and materials to support transportation agencies such as state departments of transportation, traffic management centers, and public transportation systems are described

Synopsis. The report addresses current workforce development issues for the railroad industry, and identifies best practices for creating and maintaining a competent workforce. The authors note that the majority of the current workforce is or will be retiring, creating an urgency regarding knowledge transfer and the need to address the requirements of younger workers. The report’s authors identified the following key training successes, challenges, and recommendations.

Successes:
- On-the-job training creates positive training experiences.
- State-of-the-art railroad education and training centers include the Railroad Education and Development Institute

Challenges:
- Experienced workers may be averse to provide on-the-job training due to liability concerns.
- Lack of qualified trainers
- Lack of consistent and standardized training programs
- Adapting training to different education and experience levels

Recommendations:
- A culture of preceptorship and mentoring should be created
- Increased standardization and focus on training should be promoted
- World-class training facilities and programs to deliver both classroom and hands-on training should be established


The project goal 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.” As stated in the report, “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.”
The Transit Scenarios included: flood, hurricane, earthquake, power outage, hazardous materials, and active shooter. TERA was later expanded with supplemental NCHRP funding to include state DOT roles. These expansion activities were executed in Phase 3 of the project. The research approach introduced in Chapter 1 and described more fully in Chapter 2, involved three Phases and the following sample activities per Phase:

Phase 1

- Training Needs Analysis
- Role-based learning objective profiles
- Prioritized list of potential TERA scenarios

Phase 2

- Developed storyboards and facilitator/user guides
- Developed a prototype module
- Performed field testing of the prototype module

Phase 3

- Developed the scenario-based training system
- Executed Test Plan

Chapter 3 presents the project findings. Table 3, Scenarios with Task Function Differentiators, is included in this Chapter. The Table provides a listing of various natural disaster and terrorism scenarios and also identifies sources and task function differentiators for each scenario.

Chapter 4 recommends an approach to obtaining organizational acceptance for TERA and lists sources of technical and financial support along with training and system support. Chapter 5 presents the conclusions of the project report.

Appendix A provides scenario outlines for

- Flood with Hazmat spill
- Subway Bombing/Active Shooter
- Hurricane
- Earthquake
- Cyber Attack on the Power Grid
- Hazmat

Appendix B describes command level transit agency role profiles.
Appendix C describes training objectives for transit agency roles.
Appendices D – K are only available through request via Stephan Parker. They include Scenario Scripts and Tasks by Role.

Emergency management professionals in the transportation, transit, rail, and airport domains may register to use TERA for free at www.tera.train-emst.com.
Advancing Workforce Health at the Department of Homeland Security: Protecting Those Who Protect Us


Synopsis. From the Transport Research International Documentation (TRID) Database: “The more than 200,000 men and women that make up the Department of Homeland Security (DHS) workforce have been entrusted with the ultimate responsibility – ensuring that the homeland is safe, secure, and resilient against terrorism and other hazards. Every day, these dedicated individuals take on the critical and often dangerous challenges of the DHS mission: countering terrorism and enhancing national security, securing and managing the nation’s borders, enforcing and administering U.S. immigration laws, protecting cyber networks and critical infrastructure, and ensuring resilience in the face of disasters. In return, DHS is responsible for protecting the health, safety, and resilience of those on whom it relies to achieve this mission, as well as ensuring effective management of the medical needs of persons who, in the course of mission execution, come into DHS care or custody.

“Since its creation in 2002, DHS has been aggressively addressing the management challenges of integrating seven core operating component agencies and 18 supporting offices and directorates. One of those challenges is creating and sustaining a coordinated health protection infrastructure. This report examines how to strengthen mission readiness while better meeting the health needs of the DHS workforce. This report reviews and assesses the agency’s current occupational health and operational medicine infrastructure and, based on models and best practices from within and outside DHS, provides recommendations for achieving an integrated, DHS-wide health protection infrastructure with the necessary centralized oversight authority.”

Protecting the homeland is physically and mentally demanding and entails many inherent risks, necessitating a DHS workforce that is mission ready. Among other things, mission readiness depends on (1) a workforce that is medically ready (free of health-related conditions that impede the ability to participate fully in operations and achieve mission goals), and (2) the capability, through an operational medicine program, to provide medical support for the workforce and others who come under the protection or control of DHS during routine, planned, and contingency operations. The recommendations of this report will assist DHS in meeting these two requirements through implementation (of) an overarching workforce health protection strategy encompassing occupational health and operational medicine functions that serve to promote, protect, and restore the physical and mental well-being of the workforce.”

This report has nine chapters, and includes an extensive Executive Summary. The first chapter is the Introduction. The second chapter presents the history and the challenges of the DHS Workplace and Health System. Chapter 3 presents a Comprehensive Framework for Ensuring the Health of an Operational Workforce. Chapter 4 discusses the Current State of Workforce Health Protection at DHS, and Chapter 5 discusses the need for Leadership Commitment to Workforce Health and the current strategic approach. While Chapter 6 discusses Organizational Alignment and Coordination, Chapter 7 discusses Functional Alignment. The topic of Chapter 8 is Information Management and Integration. The report concludes with Considerations for Implementation (Chapter 9).
FY Fiscal Year 2016 Transit Security Grant Program Fact Sheet


Synopsis. The 2016 Transit Security Grant Program (TSGP) is appropriated by the Department of Homeland Security Appropriations Act, 2016 (Pub. L. No. 114-113) and authorized by Section 1406 of the Implementing Recommendations of the 9/11 Commission Act of 2007, (Pub. L. No 110-53) (6 U.S.C. 1135). Owners and operators of transit systems apply for TSGP funds which are intended "to protect and increase the resilience of critical surface transportation infrastructure and the traveling public from acts of terrorism." (TSGP Fact Sheet) Reviewers of applications include representatives from FEMA, DHS Office of Infrastructure Protection (IP), Transportation Security Administration (TSA), and Federal Transit Administration (FTA). Available funds are $87,000,000.

Link for the main Transit Security Grant Program site: https://www.fema.gov/fiscal-year-2016-transit-security-grant-program

2016 Transit Security Grant Program (TSGP) Security Plan Requirements


Synopsis. To be eligible for TSGP funds, the transit agency's security plan should include the following:

- "A prioritized list of all items included in the public transportation agency's security assessment that have not yet been addressed • A detailed list of any additional capital and operational improvements identified by DHS or the public transportation agency and a certification of the public transportation agency's technical capacity for operating and maintaining any security equipment that may be identified in such list • Specific procedures to be implemented or used by the public transportation agency in response to a terrorist attack, including evacuation and passenger communication plans and appropriate evacuation and communication measures for the elderly and individuals with disabilities • A coordinated response plan that establishes procedures for appropriate interaction with State and local law enforcement agencies, emergency responders, and Federal officials in order to coordinate security measures and plans for response in the event of a terrorist attack or other major incident; • A strategy and timeline for conducting training under Section 1408 of the 9/11 Act • Plans for providing redundant and other appropriate backup systems necessary to ensure the continued operation of critical elements of the public transportation system in the event of a terrorist attack or other major incident • Plans for providing service capabilities throughout the system in the event of a terrorist attack or other major incident in the city or region which the public transportation system serves • Methods to mitigate damage within a public transportation system in case of an attack on the system, including a plan for communication and coordination with emergency responders • Other actions or procedures as the
Secretary of Homeland Security determines are appropriate to address the security of the public transportation system

Link for the main Transit Security Grant Program site:
https://www.fema.gov/fiscal-year-2016-transit-security-grant-program

Fiscal Year (FY) 2016 Transit Security Grant Program (TSGP) Notice of Funding Opportunity (NOFO) – Key Changes


Synopsis. To ensure that agencies focus on their individual risks and threats, priority scoring groups were eliminated and replaced with three equal Funding Priority Areas: "1. Operational Activities: Training, drills/exercises, public awareness, security planning 2. Operational Deterrence: Operational Packages, Directed/Surge Patrols on Overtime 3. Capital Projects* * For capital projects only, priority consideration will be given in the following order: 1. Top Transit Asset List (TTAL) Infrastructure 2. Multi-User High-Density Key Infrastructure o Tunnel Hardening o High-Density Elevated Operations o Multi-User High-Density Stations o Hardening of supervisory control and data acquisition, other industrial control systems, or other anti-terrorism cybersecurity programs o Sustainment/maintenance 3. Single-User High-Density Key Infrastructure o Anti-terrorism security enhancement measures for high-density stations and bridges o Sustainment/maintenance 4. Key Operating Asset Protection o Physical hardening/security of control centers o Secure stored/parked trains, engines, and buses (bus/rail yards) o Maintenance facilities o Bus/train hardening o Sustainment/maintenance 5. Other Mitigation Activities o Interoperable communications o Anti-terrorism security enhancement measures for low-density stations o Sustainment/maintenance o Other uses of funds, as outlined in Public Law 110-53 Section 1406(b)(1)"

Scoring criteria include

- Cost effectiveness
- Feasibility of increasing security
- Sustainability
- Timely completion
- Baseline assessment for security enhancement review alignment

Link for the main Transit Security Grant Program site:
https://www.fema.gov/fiscal-year-2016-transit-security-grant-program

Transit Safety and Security Program (TSSP) Certification, Transportation Safety Institute

Synopsis. The Transit Safety and Security Program (TSSP) Certification is administered by the FTA’s Transit Safety and Security Division. The certification program provides information on the development and implementation of system safety, security, and emergency management program plans, and is targeted towards rail and bus safety and security professionals.

The bus-oriented certificate requires successful completion of the following courses:

- **Transit Rail System Safety** (Learn basic rail system safety and safety management systems (SMS) principles, as well as the required elements of MAP-21 rule making and the State Safety Oversight Rule 49 CFR Part 659. Study hazard analysis and its implementation throughout the system life cycle, from planning and design, through construction, implementation of revenue service, and disposition. Explore system safety in the acquisition and operations phases, safety certification program, certifiable items list, security, and emergency response.)
- **Transit Rail Incident Investigation** (This course provides participants with the knowledge and skills to successfully investigate various types of transit incidents and comply with the requirements of State Safety Oversight Rule 40 CFR Part 659. This will be achieved utilizing the systems approach to incident investigation used by the National Transportation Safety Board. Examples are drawn from light rail, commuter rail, and heavy rail operations. The course will assist participants to better understand how the investigation process shall be used to prevent rail transit incidents and allow for successful implementation of corrective actions plans.)
- **Transit System Security** (Develop an increased knowledge of Transit System Security and how it relates to Safety Management Systems (SMS). Gain new resources to reduce crime and improve customer and employee security. Learn how to use a uniform format for developing and implementing security policies and procedures through a System Security Plan with crime prevention as the major component. Included are basic security terms, the eight steps in the threat and vulnerability identification, and resolution process)
- **Effectively Managing Transit Emergencies** (Nature of emergencies and disasters; emergency management concepts; Development of an emergency management plan; emergency management training)

The rail-oriented certificate requires successful completion of the following courses:

- **Transit Bus System Safety** (contains information on Threat and vulnerability analyses, Hazard identification and resolution, and Emergency/All-hazards management)
- **Fundamentals of Bus Collision Investigation** (Learn about effective tools and techniques relating to data collection, on-scene evidence documentation, damage and debris evidence analysis, witness interview techniques, computation of simple speed estimates, and report writing. Gain in-depth practical application knowledge of accident reconstruction techniques and the use of mathematical formulas to evaluate contributing factors associated with bus collisions/investigations. This course also includes and introduction to Safety Management Systems (SMS) principles, basic collision investigation procedures. Knowledge of high school algebra will greatly assist participants to successfully complete this course)
- **Transit System Security**
- **Effectively Managing Transit Emergencies**

Approved Transit Courses for Homeland Security Grants
Courses approved by the Department of Homeland Security/Office of Domestic Preparedness are eligible for a Homeland Security Grant. They include the following:

- FT00432 – Transit System Security
- FT00531 – Crime Prevention Through Environmental Design (Provides system security concepts and initiatives, the three CPTED principles, and facilities design and operations planning)
- FT00538 – Transit System Security: Design Review (Creates a proactive impact on employee and customer safety and security in the design review process for new facilities, new starts, rehabilitation of existing facilities, or extensions to current systems.)
- FT00463 – Transit Response to Bus Hijacking Seminar
- FT00456 – Effectively Managing Transit Emergencies
- FT00550 – Identify IED Threats to Public Transit
- FT00532 – Transit Response to Rail Hijacking Seminar

ACRP Report 95 Integrating A-CERTS at Airports 2013

Citation. ACRP Report 95 Integrating A-CERTS at Airports 2013

Synopsis. Airport emergency response resources are likely to become overwhelmed after a major incident. The following A-CERT team models have been successful as stopgap measures:

1. Use of airport employees who normally do not have an emergency response role
2. Use of existing outside CERT teams or recruiting outside volunteers
3. A combination of the above

This report notes that A-CERT teams may be useful for a wide range of purposes which may or may not be emergency-related. They include:

General
- Staff family support centers.
- Staff informational centers during high traffic periods such as holidays.
- Provide assistance with parking, including special event parking.
- Provide traffic control support.
- Provide evacuation assistance by leading evacuees to marshaling points.
- Assist in management of marshaling points.
- Provide food and water to airport responders.
- Assist first responders during special events.
- Act as victims for drills and exercises.

Air shows
- Assist with parking and traffic control.
- Assist with crowd control.
- Provide first aid assistance.
- Provide food and water to workers.
- Assist with clean-up efforts.
Natural disaster response and recovery
- Flooding
  - Provide sandbagging assistance.
  - Augment evacuation efforts.
- Tornado
  - Secure loose items, aircraft, and equipment.
  - Augment evacuation efforts.
- Earthquake response
  - Conduct damage assessment of airport facilities.
  - Provide glass and debris clean-up.

Other uses include the following:

Serve as training instructors for other CERT volunteers.
Provide National Incident Management System (NIMS)/Incident Command System (ICS) training for airport personnel.
Conduct damage assessments.
Conduct perimeter/fence inspections.
Conduct airport debris inspections and removal.
Provide shelter management, especially shelter-in-place following flight cancellations due to storms, volcanic ash, or other hazards.
Assist law enforcement in conducting bomb searches.
Serve as scribes for command posts using web-based systems.
Serve as observers, evaluators, or safety officers for drills and exercises.
Recruit additional CERT members.
Serve as tour guides for school or civic groups.
Serve as drivers.
Assist airport law enforcement and security personnel by serving as escorts for special events or construction projects.
Provide security when airport perimeter is breached by a disaster or accident.
Provide scene security assistance.
Provide coordination of emergency vehicles/staging officers.
Assist with triage in mass casualty events.
Provide record keeping.
Provide maintenance assistance (e.g., snow removal, debris removal, electrical, plumbing, heating and air conditioning).
Provide Americans with Disabilities Act (ADA)-compliance assessment and recommendations.
Assist with search and rescue.
Provide human resources for situational long term recovery efforts.
Staff phone banks.
Provide communications assistance (i.e., act as runners).
Provide secondary communications capabilities (e.g., amateur radio).
Provide assistance with mass casualty patient transport.
Coordinate untrained volunteers.
Provide assistance responding to or recovering from acts of terrorism, vandalism, or criminal activity.
Additional details regarding an airport CERT training program is contained in the report. Also, A-CERT training manual is available via the TRB website.

**2014 National Strategy for Transportation Security (NSTS)**

*Citation.* 2014 National Strategy for Transportation Security (NSTS): Report to Congress, April, 2015 DHS/TSA

*Synopsis.* The NSTS "presents a forward-looking, risk-based plan to protect the freedom of movement of people and goods while preserving civil rights, civil liberties, and privacy; it identifies priority objectives to enhance the security of infrastructure, conveyances, workers, travelers, and operations." The report addresses the transportation strategic planning requirement in Section 1202(b) of the Intelligence Reform and Terrorism Prevention Act in title 49 of the US Code.

NSTS goals are:

- **Goal 1:** Manage risks to transportation systems from terrorist attack and enhance system resilience.
- **Goal 2:** Enhance effective domain awareness of transportation systems and threats.
- **Goal 3:** Safeguard privacy, civil liberties, and civil rights, and the freedom of movement of people and commerce.

The report components include a base plan and the appended modal security plans for Aviation, Maritime, Highway and Motor Carrier, Mass Transit and Passenger Rail, Freight Rail, and Pipelines, and intermodal security plan.

The base plan is structured as follows: II. Sector Risk Profile, III. Guiding Principles, IV. Sector Mission, Vision, Goals, and Objectives, V. Cross Modal Priorities, VI. Performance, VII. Roles and Responsibilities, and VIII. Challenges and Path Forward

*Appendices:*

- Appendix A 2014 Aviation Security Plan
- Appendix B 2014 Maritime Security Plan
- Appendix C 2014 Surface Security Plans
- Appendix D 2014 Intermodal Security Plan

Training and exercises receive attention in the base plan and in the modal security plans as ways to enhance preparedness, response, and recovery.

- A priority activity in response and recovery from a terrorist attack is to "promote participation in local security exercises to ensure public and private familiarity with plans, procedures, and capabilities." (page 12)
- To address Chemical and Biological Threats against transit, a priority is to assure availability of response training for frontline employees.
• Domestic Nuclear Detection Office (DNDO) develops the Global Nuclear Detection Architecture, a framework to detect, analyze, and address nuclear and radiological threats against aviation, maritime, and land transportation modes. DNDO also has training and exercise programs to support their mission.

Due to changing and emerging threats, a challenge is noted as the need for security officials to have advanced technological capabilities and continual training.

Included below are highlights from the Highway and Motor Carrier, Mass Transit and Passenger Rail, and Freight Rail sections of Appendix C – 2014 Surface Security Plans.

Highway and Motor Carrier

Attack scenarios for highway and motor carrier include IEDs or Vehicle-Borne IEDs on critical infrastructure, small arms or IED attacks on passenger or school buses, use of trucks or vehicles with explosives or toxic materials as a weapon, and contamination of food products during transport. These scenarios led to the risk-based priority of enhancing frontline employee security training and awareness. A related programming priority is the use of I-STEP and the Exercise Information System to promote security strategies.

A challenge for highway and motor carrier security is noted as the changing threats and personnel turnover which require continual updating of security training. A path forward includes transitioning the First Observer™ program to a web-based training program and sharing of training materials and relevant information with stakeholders.

Mass Transit and Passenger Rail:

Based on the following mass transit and passenger rail attack scenarios:

• IED attacks on trains or infrastructure;
• Active-shooter situations;
• Sabotage of control systems; and,
• Chemical/biological attack.

A risk-based priority is to promote best practices for security planning, assessments, training, and exercises. Programming priorities include establishing an exercise program to test and improve resilience and promoting use of public awareness campaigns. The use of I-STEP is cited as a way to address the challenges of increasing operational deterrence at high-risk transit stations, and enhance modal resilience. The Transit Security Grant Program is also noted as being a priority tool for hardening assets and funding public awareness campaigns, anti-terrorism law enforcement positions, and preparedness drills and exercises.

Freight Rail:
Freight rail’s primary risk scenario includes an IED attack on hazardous materials and attacks on critical transportation system infrastructure. This scenario bolsters the following risk-based training and exercise priorities:

- “Provide effective training for frontline employees in security sensitive positions.
- Conduct effective exercises employing realistic threat scenarios that evaluate and identify opportunities to improve security and resilience.” (page 42)

NCHRP Synthesis 472: FEMA and FHWA Emergency Relief Funds Reimbursements to State Departments of Transportation


Synopsis. The executive summary states that this synthesis “focuses on state DOT experiences and practices related to the federal disaster reimbursement programs: FHWA Emergency Relief (ER) and the Federal Emergency Management Agency (FEMA) Public Assistance (PA)”. The synthesis consists of five chapters, and its case studies include ten (10) state departments of transportation (DOTs) and two (2) state emergency management agencies or offices.

After an introductory Chapter 1, the report presents an overview of the FHWA and FEMA programs in Chapter 2. Chapter 3 examines the challenges and experiences of case study state DOTs with the two federal programs. In contrast, Chapter 4 compares and contrasts these state DOTs by aspects of their current practices, such as roles and responsibilities, disaster assessment practices, financial management systems, cost sharing, etc. In its Conclusion (Chapter 5), the synthesis summarizes its findings (challenges and effective practices of state DOTs) and shares useful resources for the two federal programs.

Appendix D contains detailed write-ups of each case study participant DOT. Other appendices include

- Presidential Declarations (Appendix B),
- New York State DOT Detailed Damage Inspection Report (DDIR) form instructions (Appendix E),
- California DOT (Caltrans) Damage Assessment Form (Appendices F and G),
- Vermont Agency of Transportation (VTrans) checklists (Appendix H),
- Louisiana Department of Transportation and Development (DOTD) emergency forms and equipment/supply checklist (Appendix I), and
- Public Assistance Grant Program Summary (Appendix J)

Findings regarding state DOT training practices related to reimbursement programs included training of personnel including disaster inspection teams and financial personnel on FWHA ER and FEMA PA reimbursement programs and procedures. Agencies used scenarios from prior disasters to improve training. Also, the importance of training on documentation was emphasized in the Synthesis. A good understanding of effective documentation procedures including NIMS/ICS procedures and forms along with other activities that streamline emergency work will help agencies recover costs in an efficient manner and meet program deadlines.
Sources of FHWA ER training included FHWA Division Offices and state DOT’s FHWA ER coordinators. FHWA ER coordinators provide relevant training to state DOT personnel involved in the reimbursement process. State DOTs also provided a range of FHWA ER training to LPAs, including annual or semiannual training, training by request, and just in-time training. Examples of assistance and training provided by state DOTs are given on page 59 of the Report. In some cases, the state DOT also provides training state EMA personnel.

With respect to FEMA PA training, FEMA offers an independent study (IS), Course 634: Introduction to FEMA’s Public Assistance Program, and a 4-day course at FEMA’s Emergency Management Institute facility in Maryland. State EMAs may also provide training and assistance to state DOTs and LPAs.

State DOTs noted that they would appreciate additional training on FEMA PA and FHWA ER programs and procedures, and the funds needed to deliver such training to their staff and to LPAs.

NCHRP Report 667 Model Curriculum


Synopsis. Safety workforce development is an important concern within the transportation safety community. Retirements among experienced professionals could leave a gap in the knowledge base and slow progress on building a safe and efficient transportation system. Critical to the success of any workforce development effort is ensuring a sufficient number of professionals are entering the field. In April 2002, FHWA hosted a workshop to discuss topics related to workforce development specifically for the road safety community and to identify strategies for building the supply of road safety professionals. To further the ideas and goals of the workshop, the TRB created a Joint Subcommittee on Road Safety Workforce Development to accomplish the following objectives:

- Raise awareness of the need for education and training opportunities for road safety professionals;
- Develop a set of core competencies for road safety professionals; and
- Encourage use of the core competencies in training and education programs, hiring decisions, performance evaluations, and professional development

This report presents a model curriculum based on the core competencies developed by the Joint Task Force. The curriculum is named Road Safety 101 (Model Curriculum for Highway Safety Core Competencies) to highlight the fact that the course meets university standards and represents a beginning understanding of road safety as a discipline. The NCHRP funded the program in 2007, followed by a pilot test in 2008–2009 which included a blended learning environment (e.g., five webinars, several on-line assignments, and a three-day classroom seminar). In 2009, NCHRP provided additional resources to continue pilot testing the curriculum using different learning environments (e.g., one all classroom and one on-line).

All instructional components of this project were developed utilizing Instructional Systems Design (ISD) methodology and processes. The ISD model was designed in 1975 to solve Department of Defense training problems. It grew out of the systems analysis concepts that became popular after World War II. Today, it is the most extensively used instructional design model.
A CD is attached with this report that contains the training materials including the instructor and participant guides, PowerPoint presentations and speaker notes, and other ancillary materials, such as certificate examples, an evaluation form, a participant sign in sheet, etc. Appendix A of this report provides an outline of the materials contained on the CD.

**Clear Roads Winter Maintenance Training Reference Materials**


**Synopsis.** Clear Roads pooled fund project collected winter maintenance training material (publications and course materials) from DOTs around the country.

**Get Ready: NIMS-Compliant Training for Public Works**

**Citation.** Bergner, David, "Get Ready: NIMS-Compliant Training for Public Works," APWA Reporter, Jan. 2013, p.41.

**Synopsis.** Bergner notes that Public Works is a fundamental component of emergency management as local government is expected to handle the first 72 hours of an emergency without outside aid. However, when assistance is needed they should be able to communicate and coordinate with other emergency responders. The adoption of NIMS is a prerequisite for obtaining Federal funds for response, recovery and mitigation. Unfortunately, according to Bergner, most Public Works personnel involved in emergency response (inspectors, technicians, dispatchers, mechanics, and clerks as well as field workers and supervisors) lack even basic training on NIMS and ICS.

**It's time for TIM: Public Works and Traffic Incident Management**

**Citation.** Bergner, David, “It's time for TIM: Public Works and Traffic Incident Management,” APWA Reporter, Jan. 2014, p.47.

**Synopsis.** Bergner writes that Public Works and DOTs are often needed to assist with traffic incident management which is vital to keeping responders and the public safe and reducing unnecessary and costly congestion. Public Works/ DOTs are also needed for removal and repair of damaged pavement, structures or roadside devices, and clearing debris. In some jurisdictions the PW/DOT agency may be involved in hazmat containment or cleanup.

While law enforcement vehicles and fire trucks carry little, if any, temporary traffic control equipment, nearly all PW/DOT Maintenance and Operations personnel are certified in Temporary Work Zone Traffic Control, by the International Municipal Signal Association (IMSA), American Traffic Safety Services Association (ATSSA), the state LTAP or by the agency itself, and know how to establish a traffic incident management area (TIMA).

Bergner states that the TIM Responder course is an excellent opportunity for all disciplines, including Public Works, to better recognize, relate to and respect each other. Bergner notes that TIM courses are available from FHWA, Emergency Responder Safety Institute (ERSI) [http://learning.respondersafety.com](http://learning.respondersafety.com) and the I-95 Corridor Coalition. Additionally, APWA's Emergency Management committee is revising the
Highway Incident Manual at the request of the National Incident Management System Consortium (NIMSC).

**Expanding Role of Public Works in Emergency Management**


**Synopsis.** This paper examines the evolving mission of public works in emergency management. Maintenance and operations personnel of state DOTs and public works agencies are vital in the response and recovery phases of disasters and other emergencies, and assist with rescue, evacuation, and sheltering and provide temporary traffic control, perimeter security, animal control, transportation of supplies and equipment, on-site vehicle service, debris management, and restoration of infrastructure.

The convergence of all-hazards emergency management and traffic incident management in recent years means that public works has a different role in planning and preparing for and responding to disasters and events. The profusion of laws, mandates, and programs and the rapidly evolving body of training and knowledge can make staying abreast of these changes overwhelming.

**The Incident Command System and Winter Operations**

**Citation.** Bergner, Dave, "The Incident Command System and Winter Operations," *APWA Reporter*, Jan. 2013, p.36.

**Synopsis.** Public works agencies need to incorporate ICS concepts and formats into their winter weather operations. Winter weather operations is a very significant function of local Public Works departments and State DOTs. Even a slight amount of snow and ice on our transportations systems has detrimental impact. Because every Public Works department is unique as to size, structure, scope of services and systems, winter operations plans should be adaptable as well. ICS can be adapted and modified to the individual agency and a particular situation.

**The Role of Public Works In Traffic Incident Management And Other Emergencies And Disasters**


**Synopsis.** Emergency Management has now become a vital Public Works function in the United States since the terrorist attacks of September 11, 2001, and Hurricane Katrina in August, 2005. Public Works departments then must be more proactive in recognition of their enhanced role including its federal designation as a “first responder.” Another aspect involving emergencies is Traffic Incident Management. Public works/ transportation personnel are involved in responding to traffic incidents of all types. Many of the policies, procedures, and protocols for responding to traffic incidents are useful for other planned and unplanned events, including the larger disasters.
National Fire Protection Association (NFPA)

Available:  http://www.nfpa.org/

The NFPA offers resources on codes, standards, guidance and training on fire, electrical, and related hazards.

Occupational Safety and Health Administration (OSHA)

Available:  www.osha.gov

As described on its website, the Occupational Safety and Health Act of 1970 created the Occupational Safety and Health Administration (OSHA) “to assure safe and healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance.” OSHA standards address workplace hazards including working with hazardous materials, personal protective equipment, fire protection, fall protection, and bloodborne pathogens and provides various training resources.
Appendix A2: Fusion Centers

Fusion centers operate as state and major urban area focal points for the receipt, analysis, gathering, and sharing of threat-related information between federal; state, local, tribal, territorial (SLTT); and private sector partners. State and major urban area fusion centers (fusion centers) are owned and operated by state and local entities, and are designated by the governor of their state.

There are two types of fusion centers:

1. Primary Fusion Centers: A primary fusion center typically provides information sharing and analysis for an entire state. These centers are the highest priority for the allocation of available federal resources, including the deployment of personnel and connectivity with federal data systems.

2. Recognized Fusion Centers: A recognized fusion center typically provides information sharing and analysis for a major urban area. As the Federal Government respects the authority of state governments to designate fusion centers, any designated fusion center not designated as a primary fusion center is referred to as a recognized fusion center.
Fusion Center Contact List

**Alabama Fusion Center**
Montgomery, Alabama
Phone: (334) 517-2660
Fax: (334) 517-2746
Toll-Free: (866) 229-6220
fusioncenter@alacop.gov
fusion.alabama.gov

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Alaska Information and Analysis Center
Anchorage, Alaska
Phone: (907) 269-8900
Toll-Free: (855) 692-5425
AKIAC@alaska.gov

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**Arizona Counter Terrorism Information Center**
Phoenix, Arizona
Phone: (602) 644-5805
Toll-Free: (877) 272-8329
atic@azdps.gov
www.azdps.gov

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Arkansas State Fusion Center
Little Rock, Arkansas
Phone: (501) 618-8001
Toll-Free: (866) 787-2332
arfusioncenter@asp.arkansas.gov

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**Austin Regional Intelligence Center; Austin, TX**
Austin, Texas
Phone: (512) 974-2742
aric@austintexas.gov
www.arictexas.org

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**Boston Regional Intelligence Center; Boston, MA**
Boston, Massachusetts  
Phone: (617) 343-4328  
bric.bpd@cityofboston.gov  
www.mbhsr.org/

California State Threat Assessment Center  
Mather, California  
Phone: (916) 874-1100  
STAC@CalOES.ca.gov  
www.calstac.org

Central California Intelligence Center; Sacramento, CA  
McClellan, California  
Phone: (916) 808-8383  
Toll-Free: (888) 884-8383  
info@sacrtac.org  
www.sacrtac.org

Central Florida Intelligence Exchange (CFIX)  
Orlando, Florida  
Phone: (407) 858-3950  
cfix@ocfl.net  
www.ocso.com/cfix

Chicago Crime Prevention and Information Center; Chicago, IL  
Chicago, Illinois  
Phone: (312) 745-5669  
cpic@chicagopolice.org

Colorado Information Analysis Center  
Lakewood, Colorado  
Phone: (877) 509-2422  
cdps_ciac@state.co.us  
dhsem.state.co.us
Connecticut Intelligence Center
Hartford, Connecticut
Phone: (860) 706-5500
Fax: (806) 706-5535
ctic@ct.gov
www.ct.gov/demhs

Dallas Fusion Center; Dallas, TX
Dallas, Texas
Phone: (214) 671-3482
dallas.fusion@dpd.ci.dallas.tx.us

Delaware Information and Analysis Center
Dover, Delaware
Fax: (302) 739-1609
Alternate Phone: (302) 739-5996
Toll-Free: (800) 367-2312
diac@state.de.us
www.dediac.org

Delaware Valley Intelligence Center; Philadelphia, PA
Philadelphia, Pennsylvania
Phone: (215) 897-0800
Fax: (215) 683-2794
dvic@phila.gov
dvicphila.org

Detroit and Southeast Michigan Information and Intelligence Center; Detroit, MI
Detroit, Michigan
Phone: (313) 967-4600
DSEMIIC@michigan.gov

El Paso Multi-Agency Tactical Response
Information eXchange (MATRIX); El Paso, TX
El Paso, Texas  
Phone: (915) 212-4200  
Fax: (915) 212-0280  
pdfusion@elpasotexas.gov

Florida Fusion Center  
Tallahassee, Florida  
Phone: (850) 410-7645  
Toll-Free: (800) 342-0820  
FloridaFusionCenter@fdle.state.fl.us  
www.fdle.state.fl.us

Georgia Information Sharing and Analysis Center  
Atlanta, Georgia  
Phone: (404) 486-6420  
generalinfo@gisac.gbi.ga.gov

Greater Cincinnati Fusion Center  
Cincinnati, Ohio  
Phone: (513) 263-8000  
Fax: (513) 263-8225  
GCFC@GCFC.org  
www.GCFC.org

Hawaii Fusion Center  
Honolulu, Hawaii  
Phone: (916) 356-4467  
hsf@dod.hawaii.gov  
www.pacclear.org

Houston Regional Intelligence Service Center; Houston, TX  
Houston, Texas  
Phone: (713) 884-4710  
HRISC-Fusioncenter@houstonpolice.org
Idaho Criminal Intelligence Center  
Meridian, Idaho  
Phone: (208) 846-7676  
ICIC@fusion.idaho.gov  
www.isp.idaho.gov/icic

Illinois Statewide Terrorism and Intelligence Center  
Springfield, Illinois  
Phone: (877) 455-7842  
stic@isp.state.il.us

Indiana Intelligence Fusion Center  
Indianapolis, Indiana  
Phone: (866) 400-4432  
iifc@iifc.in.gov  
www.in.gov/iifc

Iowa Intelligence Fusion Center  
Des Moines, Iowa  
Phone: (800) 308-5983  
intel@dps.state.ia.us  
www.dps.state.is.us/intell/index.shtml

Kansas City Terrorism Early Warning Fusion Center; Kansas City, MO  
Kansas City, Missouri  
Phone: (816) 413-3601  
kctew@kcpd.org  
www.kctew.org

Kansas Intelligence Fusion Center  
Topeka, Kansas  
Phone: (785) 274-1805  
intelligence.fusion@ag.ks.gov
Kentucky Intelligence Fusion Center
Frankfort, Kentucky
Phone: (502) 564-2081
fusioncenter@ky.gov
www.homelandsecurity.ky.gov

Los Angeles Joint Regional Intelligence Center; Los Angeles, CA
Norwalk, California
Phone: (562) 345-1100
Fax: (562) 345-1766
jric@jric.org
www.jric.org

Louisiana State Analytical & Fusion Exchange
Baton Rouge, Louisiana
Phone: (225) 925-4192
Toll-Free: (800) 434-8007
lafusion.center@dps.la.gov
www.la-safe.org

Maine Information and Analysis Center
Augusta, Maine 04330-0164
Phone: (207) 624-7280
Toll-Free: (877) 786-3636
intel.msp@maine.gov

Mariana Regional Fusion Center (Guam)
Agana Heights, Guam
info@mlrin.org

Maryland Coordination and Analysis Center
Woodlawn, Maryland
Phone: (800) 492-8477
mdwatch@mcac.maryland.gov
Massachusetts Commonwealth Fusion Center
Maynard, Massachusetts
Phone: (978) 451-3711
Alternate Phone: (978) 451-3700
fusion@massmail.state.ma.us

Michigan Intelligence Operations Center
Lansing, Michigan
Phone: (517) 241-8000
Toll-Free: (877) 616-4677
mioc@michigan.gov
www.michigan.gov/mioc

Minnesota Fusion Center
St. Paul, Minnesota
Phone: (651) 793-3730
Fax: (651) 793-3731
Toll-Free: (800) 422-0798
info@icefishx.org
www.icefishx.org

Mississippi Analysis and Information Center
Pearl, Mississippi
Phone: (601) 933-7200
MSAIC@dps.ms.gov
www.homelandsecurity.ms.gov/msaic.html

Missouri Information Analysis Center
Jefferson City, Missouri
Phone: (866) 362-6422
miac@mshp.dps.mo.gov
www.miacx.org
Montana Analysis & Technical Information Center
Helena, Montana
Phone: (406) 444-1330
dojintel@mt.gov
doj.mt.gov

Nebraska Information Analysis Center
Lincoln, Nebraska
Phone: (402) 479-4049
Fax: (402) 479-4950
nefusioncenter@nebraska.gov

Nevada Threat Analysis Center; Carson City, NV
Carson City, Nevada
Phone: (775) 687-0450
ntac@dps.state.nv.us
www.ntacnv.org

New Hampshire Information and Analysis Center
Concord, New Hampshire
Phone: (603) 271-0300
nh.iac@dos.nh.gov
www.nh.gov/safety/information-analysis-center

New Jersey Regional Operations Intelligence Center
West Trenton, New Jersey
Phone: (609) 963-6900
roic@gw.njsp.org

New Mexico All Source Intelligence Center
Santa Fe, New Mexico
Phone: (505) 476-9600
intelligence.fusion@state.nm.us
www.nmdhsem.org

New York State Intelligence Center
East Greenbush, New York
Phone: (866) 723-3697
ciu@nysic.ny.gov

North Carolina Information Sharing and Analysis Center
Raleigh, North Carolina
Phone: (919) 716-1111
Toll-Free: (888) 624-7222
ncisaac@ncsbi.gov

North Central Texas Fusion Center; McKinney, TX
McKinney, Texas
Phone: (972) 548-5537
NCTFC@co.collin.tx.us
www.co.collin.tx.us

North Dakota State and Local Information Center
Bismarck, North Dakota
Phone: (866) 885-8295
ndslic@nd.gov
www.nd.gov/des/homeland/fusion-center

Northeast Ohio Regional Fusion Center; Cleveland, OH
Cleveland, Ohio
Phone: (216) 515-8477
Toll-Free: (877) 515-8477
info@neorfc.us
neorfc.us

Northern California Regional Intelligence Center; San Francisco, CA
San Francisco, California
Phone: (866) 367-8847
dutyofficer@ncric.org
www.ncric.org

Northern Virginia Regional Intelligence Center; Fairfax, VA
Fairfax, Virginia
Phone: (703) 212-4590
fcpdnvric@fairfaxcounty.gov
Ohio Strategic Analysis and Information Center
Columbus, Ohio
Phone: (614) 799-3555
saic@dps.state.oh.us
www.homelandsecurity.ohio.gov/index.stm

Oklahoma Information Fusion Center
Oklahoma City, Oklahoma
Phone: (405) 842-8547
Alternate Phone: (405) 848-6724
fusion@osbi.ok.gov
www.okfusion.ok.gov

Orange County Intelligence Assessment Center; Orange County, CA
Santa Ana, California
Phone: (714) 289-3949
Fax: (714) 289-1025
ociac@ociac.org
www.ociac.org

Oregon Terrorism Information Threat Assessment Network
Salem, Oregon
Phone: (503) 378-6347
oregonfusioncenter@doj.state.or.us
www.oregonfusioncenter@doj.state.or.us

Pennsylvania Criminal Intelligence Center
Harrisburg, Pennsylvania
Phone: 888-292-1919
sp-intelligence@pa.gov
www.psp.pa.gov

Puerto Rico National Security State Information Center
Hato Rey, Puerto Rico
Phone: (787) 793-1234
nssic@policia.pr.gov
Rhode Island State Fusion Center
Providence, Rhode Island
Phone: (866) 490-8477
Fax: (401) 458-1173
fusion@risp.dps.ri.gov

San Diego Law Enforcement Coordination Center; San Diego, CA
San Diego, California
Phone: (858) 495-5730
info@sd-lecc.org

South Carolina Information and Intelligence Center
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Phone: (866) 472-8477
Toll-Free: (803) 896-7133
sciic@sled.sc.gov
www.sled.sc.gov

South Dakota Fusion Center
Sioux Falls, South Dakota
Phone: (605) 367-5940
sdfusioncenter@state.sd.us

Southeast Florida Fusion Center; Miami, FL
Miami, Florida
Phone: (305) 470-3900
ioc@mdpd.com
www.mdpd.com

Southeastern Wisconsin Threat Analysis Center; Milwaukee, WI
Milwaukee, Wisconsin
Phone: (414) 935-7741
stac@milwaukee.gov
WiWATCH.org

Southern Nevada Counter-Terrorism Center (Las Vegas, Nevada)
Las Vegas, Nevada
Southwest Texas Fusion Center; San Antonio, TX  
San Antonio, Texas  
Phone: (210) 207-7680  
swtxfusion@sanantonio.gov

Southwestern PA Region 13 Fusion Center; Pittsburgh, PA  
Pittsburgh, Pennsylvania  
Phone: (412) 473-2550

St. Louis Fusion Center; St. Louis, MO  
St. Louis, Missouri  
Phone: (314) 615-4839  
info@sltew.org  
www.sltew.org

Tennessee Fusion Center  
Nashville, Tennessee  
Phone: (877) 250-2333  
tfc@tn.gov  
www.tennessee.gov/homelandsecurity

Texas Joint Crime Information Center  
Austin, Texas  
Phone: (866) 786-5972  
TXJCIC@dps.texas.gov

U.S. Virgin Islands Fusion Center  
St. Thomas, Virgin Islands  
Phone: (340) 776-3013  
fusioncenter@vitema.vi.gov
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<thead>
<tr>
<th>Statewide Information and Analysis Center</th>
<th>Sandy, Utah</th>
<th>Phone: (801) 256-2360</th>
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<td><strong>Utah Statewide Information and Analysis Center</strong></td>
<td><strong>Sandy, Utah</strong></td>
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<td><strong><a href="mailto:SIAC@utah.gov">SIAC@utah.gov</a></strong></td>
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<td>Williston, Vermont</td>
<td>Phone: (802) 872-6110</td>
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<td>Virginia Fusion Center</td>
<td>North Chesterfield, Virginia</td>
<td>Phone: (804) 674-2196</td>
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<td>Washington Regional Threat and Analysis Center (Washington, D.C.)</td>
<td>Washington, DC, Washington DC</td>
<td>Phone: (202) 481-3075</td>
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<td><strong>Washington Regional Threat and Analysis Center (Washington, D.C.)</strong></td>
<td><strong>Washington, DC, Washington DC</strong></td>
<td><strong>Phone: (202) 481-3075</strong></td>
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<td>Washington State Fusion Center</td>
<td>Seattle, Washington</td>
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<td><strong><a href="mailto:wvfusion@wv.gov">wvfusion@wv.gov</a></strong></td>
<td><strong><a href="http://www.fusioncenter.wv.gov">www.fusioncenter.wv.gov</a></strong></td>
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<td>Wisconsin Statewide Information Center</td>
<td>Madison, Wisconsin</td>
<td>Phone: (608) 242-5393</td>
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<td><strong>Wisconsin Statewide Information Center</strong></td>
<td><strong>Madison, Wisconsin</strong></td>
<td><strong>Phone: (608) 242-5393</strong></td>
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</table>
Appendix A2: Information Sharing Analysis Centers (ISACs)

The purpose of Information Sharing Analysis Centers is to serve as the conduit for cross-modal lessons learned and best practices in ICS cybersecurity, and to provide a forum for partnership, outreach, and information sharing. More information can be found at [http://www.isaccouncil.org](http://www.isaccouncil.org)

Surface Transportation Information and Sharing Analysis Center
Online: [https://www.surfacetransportationisac.org/](https://www.surfacetransportationisac.org/)

The ST-ISAC was formed at the request of the Department of Transportation. The ISAC provides a secure cyber and physical security capability for owners, operators and users of critical infrastructure. Security and threat information is collected from worldwide resources, then analyzed and distributed to members to help protect their vital systems from attack. The ISAC also provides a vehicle for the anonymous or attributable sharing of incident, threat and vulnerability data among the members. Members have access to information and analytical reporting provided by other sources, such as the U.S. and foreign governments; law enforcement agencies, technology providers and international computer emergency response teams (CERT’s).

Public Transportation Information Sharing and Analysis Center
Online: [http://www.apta.com/resources/safetyandsecurity/Pages/ISAC.aspx](http://www.apta.com/resources/safetyandsecurity/Pages/ISAC.aspx)

The PT-ISAC is a trusted, sector-specific entity which provides to its constituency a 24/7 Security Operating Capability that established the sector’s specific information/intelligence requirements for incidences, threats and vulnerabilities. Based on its sector-focused subject matter analytical expertise, the ISAC then collects, analyzes, and disseminates alerts and incident reports it provides to its membership and helps the government understand impacts for their sector. It provides an electronic, trusted ability for the membership to exchange and share information on all threats, physical and cyber, in order to defend public transportation systems and critical infrastructure. This includes analytical support to the Government and other ISAC’s regarding technical sector details and in mutual information sharing and assistance during actual or potential sector disruptions, whether caused by intentional or natural events.

Over the Road Bus Information Sharing and Analysis Center (OTRB ISAC)

The OTRB ISAC provides cyber and physical security warning and incident reporting for the OTR transportation segment. Information and news are compiled and extracted from multiple sources by OTRB-ISAC analysts for the purpose of supporting ISAC member homeland security awareness. News alerts and reports are distributed to members by the Over the Road Bus – Information Sharing & Analysis Center (OTRB-ISAC).

MultiState-ISAC (MS-ISAC)
Online: [http://msisac.cisecurity.org/](http://msisac.cisecurity.org/)

The MS-ISAC is the focal point for cyber threat prevention, protection, response and recovery for the nation’s state, local, tribal, and territorial (SLTT) governments. The MS- ISAC 24x7
cybersecurity operations center provides real-time network monitoring, early cyber threat warnings and advisories, vulnerability identification and mitigation and incident response. The Multi-State Information Sharing and Analysis Center (MS-ISAC) is a collaborative state and local government-focused cybersecurity entity that is significantly enhancing cyber threat prevention, protection, and response and recovery throughout the states of our nation. The mission of the MS-ISAC is to provide a common mechanism for raising the level of cybersecurity readiness and response in each state/territory and with local governments. The MS-ISAC provides a central resource for gathering information on cyber threats to critical infrastructure and providing two-way sharing of information between and among the states, territories and with local government.

Supply Chain ISAC
Online: [https://secure.sc-investigate.net/SC-ISAC/ISACHome.aspx](https://secure.sc-investigate.net/SC-ISAC/ISACHome.aspx)

The Supply Chain ISAC offers the most comprehensive forum for collaboration on critical security threats, incidents and vulnerabilities to the global supply chain. Its mission is to facilitate communication among supply chain dependent industry stakeholders, foster a partnership between the private and public sectors to share critical information, collect, analyze and disseminate actionable intelligence to help secure the global supply chain, provide an international perspective through private sector subject matter experts and help protect the critical infrastructure of the United States.
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<tr>
<th>STEPS</th>
<th>PHASE: PLAN</th>
<th>ACTION ITEM</th>
<th>SUPPORTING ACTIONS</th>
<th>STATUS</th>
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</thead>
</table>
| 1. Form a collaborative planning team. | PLAN-01 | Identify and designate lead Emergency Planning Coordinator and team for the state transportation agency. | 1.1. Select an Emergency Planning Coordinator (EPC) for the agency and supporting team members.  
1.2. The size of the planning team will depend on the scope of the agency’s operations, requirements, and resources.  
- The planning team should be of sufficient size to encourage participation and investment in the process.  
- Design the planning team to enhance the visibility and stature of the planning process and to provide a broad perspective on the issues.  
- The planning team should include active members and advisory members.  
- In most cases, a small group (5 to 7 people) will do the bulk of the work; however, identify other members to review planning documents, coordinate input, identify resources and needs, and assess outcomes.  
- Structure the planning group to receive input from all agency functional areas. |       |
|       | PLAN-02 | Establish authority. | 2.1. Demonstrate management’s commitment and promote an atmosphere of cooperation by authorizing the state transportation agency EPC and planning team to take the steps necessary to develop/update the agency’s emergency plans and response program.  
2.2. Executive management should strongly support EPC’s participation in the State Emergency Operations Plan (EOP) process and define authority.  
2.3. Establish a clear line of authority between team members and the agency Emergency Planning Coordinator.  
2.4. Upper management should appoint participants, in writing, to the planning group. Participant job descriptions could also reflect this assignment. |       |
|       | PLAN-03 | Issue a Mission Statement. | 3.1. The agency Chief Executive Officer should issue a mission and vision statement to demonstrate a commitment to emergency planning.  
3.2. The statement should  
- Define the scope of activities to be performed by the emergency management coordinator and planning team.  
- Identify the agency’s high-level goals for the emergency planning process.  
- Identify the documents and/or programs the agency emergency planning team is to develop.  
- Indicate that creation of these documents and programs will involve the entire organization.  
- Define the authority and structure of the planning group. |       |
|       | PLAN-04 | Establish a schedule and budget. | 4.1. Emergency Management Team should define specific goals and objectives of the emergency management process and performance metrics.  
4.2. Establish a work schedule and planning deadlines. Modify timelines as priorities are more clearly defined.  
4.3. Develop an initial budget for such things as research, printing, seminars, consulting services, and other expenses that may be necessary during the development process. |       |
| 2. Conduct research and analyze data. | PLAN-05 | Identify documents to be developed, reviewed, approved, and/or updated regarding the state transportation agency’s emergency response plans and programs. | 5.1. The agency emergency planning process should begin with the State Emergency Operations Plan (SEOP) and the functional annexes and hazard-specific appendices.  
5.2. The State EOP may be supported by specific plans, procedures or other documents developed by the state transportation agency and/or other agencies to support implementation of the SEOP, including the following:  
- **Overview and Primers provide a brief concept summary of a function, team, or capability.**  
- **Standard Operating Procedures (SOPs) or Operations Manuals** provide a complete reference document, detailing the procedures for performing a single function (SOP) or a number of interdependent functions (Operations Manual).**  
- **Field Operations Guides (FOGs) or Handbooks** provide durable pocket or desk guides, containing essential basic information needed to perform specific assignments or functions.  
- **Job Aids** include checklists or other aids useful in performing or training for a specific job to be performed in the EOP.  
5.3. Other plans may be available for agency review, including |       |
### Appendix A3

<table>
<thead>
<tr>
<th>PLAN-06</th>
<th>Work with the State National Incident Management System (NIMS) Coordinator to identify state transportation agency requirements for addressing statewide NIMS implementation.</th>
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</thead>
<tbody>
<tr>
<td>6.1. <strong>Meet with the state’s NIMS Coordinator to establish a working relationship for addressing NIMS compliance issues</strong>. **6.2. <strong>Determine if the agency should have a NIMS coordinator. If so, and if one has not already been assigned, determine whether the agency Emergency Planning Coordinator should assume this role.</strong> 6.3. <strong>Receive and review a copy of the State’s NIMS Implementation Plan.</strong> 6.4. <strong>Obtain from the state’s NIMS Coordinator a clear list of NIMS requirements being addressed by the state and any outstanding Corrective Action Plans (CAPs) filed with FEMA that may relate to the agency.</strong> 6.5. <strong>Ensure that state adoption of NIMS through executive order, proclamation, resolution, or legislation applies to the transportation agency and that no additional action is required by the agency to formally adopt NIMS.</strong> 6.6. <strong>Determine how the state has established its NIMS compliance baseline against the FY05 and FY06 NIMS implementation requirements and the specific actions required for the agency in FY 2007 through FY 2009.</strong> 6.7. <strong>Determine any specific NIMS training requirements applicable for the transportation agency and obtain the status of the department in meeting these requirements.</strong> 6.8. <strong>Determine whether the state is implementing NIMS resource typing protocols for the inventory and tracking of transportation related resources and what actions the agency should perform to ensure incorporation of these protocols into its planning activities.</strong> 6.9. <strong>If not already occurring, determine if monthly or quarterly meetings should be conducted with the state’s NIMS Coordinator to ensure full implementation of NIMS in all transportation agency planning, training, and drilling activities.</strong></td>
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<tr>
<th>PLAN-07</th>
<th>Review State EOP and supporting annexes and other documents for transportation related activities.</th>
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<tr>
<td>7.1. Ensure documents accurately reflect transportation-related resources and authorities. 7.2. Ensure the SEOP clearly defines leadership roles and responsibilities for transportation-related issues and clearly articulates the decisions that need to be made, who will make them, when they will be made, and to whom they should be disseminated. 7.3. Ensure the SEOP facilitates response and short-term recovery activities required from a transportation perspective. 7.4. Ensure the SEOP includes strategies for both no-notice and forewarned evacuations, with particular considerations for assisting vulnerable (e.g., mobility disabled/disadvantaged) populations and for dealing with animal populations. 7.5. Verify that specific procedures and protocols have been developed to augment the SEOP to guide rapid implementation of transportation requirements—both to provide the emergency services needed by the population in general and for the transportation department(s) itself. 7.6. Verify that the situations and assumptions identified in the State EOP are appropriate from a transportation perspective. 7.7. Verify that the concept of operations in the State EOP adequately addresses transportation roles, responsibilities, capabilities, and concerns. 7.8. Verify that the organization and assignment of responsibilities in the State EOP and supporting annexes and appendices is adequate for transportation-related activities. 7.9. Verify that administration, communications, and logistics sections of the SEOP accurately reflect transportation general support requirements and availability of support services from other agencies, including general policies for managing resources and activating mutual-aid agreements, liability provisions, and policies for reassigning public employees and soliciting and using volunteers. Also, make sure that general policies on financial record keeping, tracking resources, and compensation of private property owners are appropriate for the agency. 7.10. Verify that the State EOP contains authorities and references appropriate for transportation response, including any laws, statutes.</td>
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</table>
7.11. Verify that coordination processes are in place to share information and any necessary command and control with the regional Transportation Management Center (TMC), if present.
7.12. Verify that coordination processes are in place to share information with the regional Intelligence Fusion Center (IFC), if present.
7.13. Verify that the functional annexes and hazard-specific appendices identify activities to be performed by all agencies and organizations with responsibilities under transportation functions. Functional annexes also should clearly define actions before, during, and after an emergency event. Hazard-specific appendices should identify specific transportation activities to take in unique circumstances beyond the basic approach detailed in the State EOP.
7.14. Verify that transportation terms are included and correctly defined in the State EOP glossary.
7.15. Verify that the SEOP pre-designates transportation representatives to the State Emergency Operations Center (SEOC)/Multiagency Coordination System (MACS).
7.16. Verify that the State EOP includes pre-incident and post-incident public awareness, education, and communications plans and protocols related to transportation.
7.17. Verify that the State EOP includes local post-incident debriefings and after-action reporting (see federal coordination later).
7.18. Verify that the State EOP includes provisions for notifying regional and national authorities if the event would not ordinarily rise to the level of a major disaster in itself, but could have widespread indirect impacts (e.g., a traffic incident that creates congestion sufficient to delay airline crews from reaching a major airport, thus widely disrupting flight schedules).

### PLAN-08
Review relevant hazards likely to result in an emergency requiring activation of the State Emergency Operations Center.

| 8.1. Determine if the hazards identified in the State EOP are appropriate and complete from a transportation perspective.
| 8.2. Ensure that the SEOP addresses all hazards that the state may reasonably expect to occur and all the preparedness and incident management activities necessary to ensure an effective response to those hazards from a transportation perspective.
| 8.3. Determine if the SEOP clearly indicates which types of hazards would likely require mobility restriction measures (shelter-in-place/quarantine) as part of the response (e.g., earthquake, pandemic flu) and which ones would require enhanced mobility (evacuation) (e.g., hurricanes).
| 8.4. Determine if the hazard-specific annexes adequately address the transportation-related aspects of the identified hazards or additional elements should be considered to address the hazard.
| 8.5. Ensure that pipelines, viaducts, etc., are included in the EOP.
| 8.6. **NOTE:** Hazard maps are available in compilations of hazard information made by FEMA and state emergency management agencies, the U.S. Geological Survey (USGS) and state geological surveys, and the National Weather Service (NWS) and its local offices. Maps from the Federal Insurance Administration (FIA), map of 10- and 50-mile emergency zones (EPZs) around nuclear power plants, and any maps of hazardous materials (HAZMAT) sites prepared by Local Emergency Planning Committees (LEPCs) may also be useful.

### PLAN-09
Gather information regarding vulnerable populations.

**Note:** Vulnerable populations typically include individuals with disabilities, children, senior citizens, pregnant women, people with pets, low-income, transit-dependent, hospitalized and institutionalized (including incarcerated persons); those with limited English proficiency or who are non-English.

| 9.1. Identify issues and requirements associated with vulnerable populations.
| 9.2. Identify potential assets to deploy for these populations in an emergency, as needed, and have contact information readily available.
| 9.3. Identify appropriate destinations for evacuation or restriction measures (shelter-in-place/quarantine) for vulnerable populations and have contact information readily available, or a path to locate such facilities.
### Appendix A3

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<tr>
<th>PLAN-10</th>
<th>Determine status of state transportation agency emergency planning activities to date and identify areas in need of improvement.</th>
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<tbody>
<tr>
<td>10.1.</td>
<td>Has the agency completed procedures regarding how to work with the state to request federal assistance?</td>
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<tr>
<td>10.2.</td>
<td>Does the agency have written procedures on how to secure assistance through mutual-aid agreements that may exist?</td>
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<td>10.3.</td>
<td>Does the agency have established orders of succession or a COOP plan?</td>
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<td>10.4.</td>
<td>Does the agency have established, documented procedures for tracking action items and mission assignments?</td>
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<td>10.5.</td>
<td>Does the agency have established, documented procedures for requesting and tracking requests for resources?</td>
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<tr>
<td>10.6.</td>
<td>Does the agency have established, documented procedures for participating in the SEOC, to include levels of activation based on the event(s) in progress?</td>
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<td>10.7.</td>
<td>Are there written processes for administrative functions that agency representatives may perform within the EOC, such as computer protocols, e-mail conventions, telephone use, security, logging hours, and reporting procedures?</td>
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<tr>
<td>10.8.</td>
<td>Does the agency have documented procedures for tracking expenditures?</td>
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<td>10.9.</td>
<td>Are there written procedures for involving and orienting private sector interests that may be participating in emergency activities managed by the agency?</td>
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<tr>
<td>10.10.</td>
<td>Are there written procedures for involving and orienting volunteers and volunteer organizations participating in emergency activities if managed by the agency?</td>
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<tr>
<td>10.11.</td>
<td>Do written agency procedures comply with legal statutes for risk-based, hazard-specific programs that require them to accept, or to the contrary reject, volunteers (e.g., volunteer fire fighters who are not on duty and/or properly attired and equipped)?</td>
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<td>10.12.</td>
<td>Are there written agency procedures for communicating timely and accurate information to the public?</td>
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<td>10.13.</td>
<td>Are there written agency procedures for issuing public warnings via sirens, Emergency Advisory System (EAS), and/or other warning mechanisms?</td>
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<td>10.14.</td>
<td>Do agency procedures identify coordination points with other operational agencies, teams, or sections?</td>
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<td>10.15.</td>
<td>Has the agency developed overview documents outlining qualifications of their personnel?</td>
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<td>10.16.</td>
<td>Has the agency developed overview documents that describe general tasks and responsibilities and hazard-specific tasks and responsibilities?</td>
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<td>10.17.</td>
<td>Has the agency developed procedures that translate tasking into specific actions that describe how the organization will accomplish assigned tasks?</td>
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<tr>
<td>10.18.</td>
<td>Does the agency have or use one or more of the following:</td>
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<tr>
<td></td>
<td>• <strong>Checklists?</strong>**</td>
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<tr>
<td></td>
<td>• <strong>Resource listings?</strong>**</td>
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<tr>
<td></td>
<td>• <strong>Related maps and charts?</strong>**</td>
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<td></td>
<td>• <strong>Other pertinent data?</strong>**</td>
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<td>10.19.</td>
<td>Does the agency address:</td>
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<td>• <strong>Notification mechanisms?</strong>**</td>
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<td></td>
<td>• <strong>Staffing of positions three levels deep?</strong>**</td>
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<td>10.20.</td>
<td>Does the agency identify components in field Operating manuals or desk handbooks for support personnel unfamiliar with this jurisdiction’s emergency operations?</td>
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<tr>
<td>10.21.</td>
<td>Has the agency developed checklists and/or job aids to assist personnel to complete their tasks?</td>
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<tr>
<td>10.22.</td>
<td>Does the agency have documented procedures for rapid needs assessment and coordinating with the federal damage assessment teams after an event?</td>
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<tr>
<td>10.23.</td>
<td>Does the agency have documented procedures for requesting post disaster assistance from the federal government, including public speaking; individuals lacking transportation; those with chronic medical disorders; and people with pharmacological dependency.</td>
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<td>Appendix A3</td>
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<td>10.24. Does the agency have documented procedures in place to coordinate the distribution of mass prophylaxis, such as the National Strategic Stockpile, if applicable?</td>
<td>10.25. Does the agency have documented procedures in place to support evacuations (including contraflow operations if appropriate) or shelter-in-place/quarantine and mass care, if applicable?</td>
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</table>
| PLAN-12 | Based on activities identified in the State EOP and supporting annexes and appendices, develop/update the state transportation agency’s Transportation Management Organization to ensure all activities conducted conform to NIMS and National Response Framework (NRF) requirements. | 12.1. “Update organization charts and determine if specific teams, groups, committees, and/or temporary organizations will be used to manage agency responses to emergencies identified in the State EOP.”  
12.2. “Be sure to review agency TIM Plans and Protocols and specific emergency response plans to identify incident management structures currently used.”  
12.3. “Identify and train agency field personnel in charge of on-scene response to coordinate with the ICS established by the local or state emergency response agencies on-scene. Points of Incident interface with the ICS established by local/state agencies may include”  
• **Incident Command Posts (ICPs) and staging areas, for reporting and resource management.**  
• **ICS and Unified Command or even Area Command (if needed) to guide incident action planning.**  
• **State, local, and private-sector EOCs.**  
• **Coordination with TMC and/or FCs.**  
• **Participation in Joint Information Center (JIC) to manage public information.**  
• **Participation in a Joint Field Office (JFO) to coordinate federal response and resources.**  
• **Possible coordination with Regional Response Coordination Center (RRCC) and Homeland Security Operations Center (HSOC) in events of national significance.**  
12.4. “Consider preparing an overview document/primer and a FOG on the agency’s Incident Management Organization, including how this organization may change depending on the type of emergency being managed.” |
| 3. Determine goals and objectives. | PLAN-13 | Establish operational priorities, response goals, and intermediate objectives for the state transportation agency in response to the hazards identified and the existing State EOP and supporting documents, as well as new challenges identified during the analysis process. |
| 13.1. Clarify what constitutes success regarding the agency’s response to the range of emergencies that could occur resulting from the hazards identified for the state. |
| 4. Develop and analyze courses of action and identify resources. | PLAN-14 | Use scenario based, functional, and capabilities based planning to depict how the state transportation agency’s response |
| 14.1. Use a formal process for building relationships among the occurrence of hazards, decision points, and response actions. |
| PLAN-15 | Identify the resources needed to support the state transportation agency’s response activities. | 15. Ensure that adequate resources are available. |
| PLAN-16 | Develop and/or update transportation related components of the State EOP, functional annexes, and hazard-specific appendices. | 16. Complete state transportation planning inputs and deliverables for the State EOP and supporting documents. 16.2. Establish expectations regarding transportation functions during the range of potential incidents addressed in the State EOP. 16.3. Develop/update transportation-related components of the State SOP, the functional annexes to the State EOP, and the hazard specific appendices to the State EOP. 16.4. Ensure that agency liaisons are available to support the SEOC *and, if applicable, the county/municipal EOCs, TMC(s), and/or FC(s) during a state-declared emergency.* |
| PLAN-17 | Develop supporting materials, including any specific plans, guidance, overviews documents, SOPs, operating manuals, FOGs, handbooks, and job aids needed to support state transportation agency personnel capabilities to respond to emergencies. | 17. Ensure that sufficient materials exist to support the training and response activities of agency personnel during emergencies. 17.2. Identify needed agency plans or documents to be developed, including any agency-specific emergency response plans, COOP/COG plans, etc. 17.3. Develop SOPs detailing the procedures for performing individual functions identified in the transportation-related component of the State EOP and Hazard-Specific Annexes. 17.4. If applicable, develop an Operations Manual detailing the performance of a number of interdependent functions specified in the transportation-related elements of the State EOP. 17.5. Develop a FOG or Handbook, such as a durable pocket or desk guide, containing essential basic information needed to perform specific assignments or functions as specified in the transportation-related elements of the State EOP. 17.6. Develop Job Aids to provide detailed checklists or other aids for job performance or job training regarding the transportation-related elements specified in the State EOP and Hazard-Specific Annexes. 17.7. Develop criteria for the reporting, and (particularly) verification of a potential incident by motorists or citizens, even from specially trained individuals, such as those involved in *road watch, first observer, transit watch, volunteer spotter,* and other probe programs (including transit vehicle operators). |
| PLAN-18 | Formally approve and implement the transportation--related provisions of the State and transportation agency EOPs and supporting annexes and agency-specific supporting materials. | 18. Ensure adoption of the plan and supporting materials. |
| PLAN-19 | Develop a Coordinated program of training, drills, and exercises. | 19. Ensure state transportation agency personnel are trained in how to respond to emergencies. |
| PLAN-20 | Establish an ongoing review and assessment | 20. Ensure that the agency plans, procedures, and supporting materials include the latest information. 20.2. Design periodic exercises to test, even stress, established processes to
<p>| plan. | process for the transportation-related elements of the state and state transportation agency EOPs and supporting materials. | identify needed improvements. |  |</p>
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<th>STEPS</th>
<th>PHASE: PREPARE</th>
<th>ACTION ITEM</th>
<th>SUPPORTING ACTIONS</th>
<th>STATUS</th>
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</table>
| 1. Develop approaches for implementing state transportation agency roles and responsibilities during emergencies, as specified in the State EOP and supporting annexes and references. | PREPARE-01 | Establish Protocols for Addressing National Terrorism Advisory System (NTAS) Bulletins and Alerts | 1.1 Clarify the threat warning and notification system(s) to be used by the state transportation agency.  
1.2 Identify, to the extent possible, the specific actions, precautions, and protective measures that the agency will take for each NTAS advisory type – Bulletins, Elevated Alerts, and Imminent Alerts.  
1.3 Where possible, coordinate the activities identified with the transportation–related activities identified in state’s based Emergency Operations Plan (EOP) and the Hazard-Specific Annexes. |        |
|         | PREPARE-02 | Develop Intrastate and Interagency Memorandum of Understanding/Agreement (MOU/A) including agreements with private organizations, schools, and NGOs regarding transportation-related elements specified in the State and Regional EOPs. | 2.1 Assess existing MOU/As, and compacts. Identify gaps.  
2.2 Promote intrastate and interagency mutual-aid agreements (including agreements with and among transit agencies and other transportation providers, local agencies, MPOs, Councils of Governments, planning organizations, regional incident response networks, Urban Area Security Initiatives, operators of critical infrastructure, state and local health agencies, Community Based Organizations, Faith Based Organizations, NPOs, and private sector partners and contractors.)  
2.3 Establish MOU/As and notification/information-sharing protocols regarding transportation-related elements specified in the State and Regional EOPs. Remember to include special populations such as access and functional needs populations and children as well as household pets and service animals.  
2.4 Use the state/territory response asset inventory for Intrastate and Interstate Mutual Aid (e.g., EMAC) requests, exercises, and actual events.  
2.5 Implement NIMS resource typing, credentialing, and other resource management activities.  
2.6 Build relationships with local, regional, state, and federal EMAs, EOCs, emergency planning committees, emergency response commissions, TMCs, Fusion Centers (FCs), regional incident response networks, and public health and agricultural organizations.  
2.7 Establish MOU/As with and among agencies and entities with substantial transportation resources such as emergency equipment and assets, situational awareness and intelligence, emergency personnel and vehicles, routes, and management resources. Agencies and organizations include transit agencies, the Department of Education/schools, vans and buses operated by Community Based Organizations, Faith Based Organizations, NPOs, and private sector agencies; owners/operators of aerial support, ferries and private water craft; community service providers, etc. for use of their vehicles and operations of Vehicle Staging Areas. Establish MOU/As with and among owners of tow trucks and entities and contractors such as waste haulers and spill contractors owning/operating other specialized emergency equipment. Establish MOU/As with and among the owners of utilities (e.g., electrical power transmission trunk lines), pipelines, viaducts, and operators of critical infrastructure, etc. for monitoring of these facilities and include in the EOP.  
2.8 Establish MOU/As with and among local jurisdictions, state and local public safety and law enforcement, and regional incident response networks and private companies and contractors to address TCPs and other emergency traffic management issues including route and bridge closures, traffic evacuation measures and pre-planning of contraflow routes.  
2.9 Consider accessing national mutual aid systems.  
2.10 Share agreements, as required.  
2.11 MOU/As should include the following provisions:  
• Notification procedures  
• Resource identification/typing, request and ordering, mobilization, and tracking procedures  
• Procedures for providing assistance  
• NIMS requirements  
• Training and exercise requirements  
• Participating agencies’ jurisdictional boundaries  
• Authorities and definition of key terms, roles and responsibilities of individuals, and contact information. |        |
### PREPARE-03

**Develop an approach to provide state transportation agency Mission Essential Functions during emergencies.**

<table>
<thead>
<tr>
<th>Appendix A3 Prepare</th>
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<tbody>
<tr>
<td>• Requirements and issues regarding drivers or operators of the transportation vehicles and equipment.</td>
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<td>• Rules for payment, reimbursement, and cost allocation.</td>
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<td>• Workers’ compensation and treatment of liability and immunity.</td>
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<td>• Recognition of qualifications and certifications.</td>
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<tr>
<td>• Review, support, and adopt NIMS national credentialing system.</td>
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<td>• Protocols for interoperable communications</td>
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<td>• Protocols for public information and warning</td>
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<td>• Protocols for evacuation, reception, and shelter</td>
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<tr>
<td>• Protocols for preparedness, response, recovery, and protective actions</td>
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<tr>
<td>• Expand MOU/As to include information-sharing and interagency decision making, command and management/chain of command and control</td>
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<tr>
<td>• Relationships with other agreements among jurisdictions</td>
<td></td>
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<tr>
<td>• Process for modification and evaluation of procedures and protocols</td>
<td></td>
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<tr>
<td>• Sharing agreements</td>
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</tbody>
</table>

Two examples of MOU/As are provided in Step Five, Tool 5.3 of NCHRP Report 740. Examples of MOU/As are also provided in the Appendix of this Guide. Information about transportation related resources are contained in Step 4 of NCHRP Report 740.

3.1 Develop a state transportation agency COOP which plans for the deployment of pre-designated, trained personnel who will take appropriate actions to implement the plan and execute the transfer of Mission Essential Functions and Essential Supporting Activities.

3.2 COOP elements should reflect and be aligned with relevant national standards and guidance including DHS and FEMA guidance (e.g., 2016 PPD-40 on National Continuity Policy and the 2013 FEMA Continuity Guidance Circular), and state plans and guidance. The COOP should include actions that need to be taken with key resources of leadership and staff, interoperable, robust, and reliable communications systems and technologies, and facilities to ensure the continuity of the agency’s Mission Essential Functions and Essential Supporting Activities.

The COOP should also reflect relevant national standards and guidance on equipment, communications, and data interoperability; the standards and guidance should be incorporated into state and local acquisition programs.

The COOP should address continuity issues of geographic dispersion, risk management, security, readiness and preparedness as well. Refer to 2013 FEMA Continuity Guidance Circular for additional information on different categories of essential functions and these issues.

3.3 The COOP should include extended/emergency staffing plans due to staffing losses from natural disasters, disease or pandemic, and other emergencies. The plans should include suspension of vacation and leave and overtime/compensatory time provisions and self-sustaining teams as warranted.

3.4 The COOP should identify strategies to execute a successful order of succession with accompanying authorities.

3.5 The COOP should reduce the loss of life and minimize property damage and loss; and, protect personnel, facilities, equipment, records, and other assets critical to the performance of essential functions. The COOP should also reduce or mitigate disruptions to operations.

3.6 The COOP should ensure there are facilities from which organizations can perform essential functions.

3.7 The COOP should achieve the organization’s timely and orderly recovery and reconstitution from an emergency.

3.8 The COOP should also ensure and validate continuity readiness through a continuity Testing, Training, and Exercise program and operational capability. Guidance on a Testing, Training, and Exercise program are contained in the 2013 FEMA Continuity Guidance Circular.

3.9 Include the following four operational phases in the agency’s continuity implementation process: readiness and preparedness, activation, continuity operations, and reconstitution.
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3.10 The COOP should also address the following:
- Operational Concept
- COOP Activation/Termination
- Roles and Responsibilities
- Risk Management
- Maintenance of COOP/Updating the Plan
- Budgeting/acquisition of resources
- Essential Functions
- Orders of Succession
- Delegations of Authority
- Continuity Facilities
- Continuity Communications, Security, and Logistics
- Essential Records Management
- Human Resources
- Test, Training, and Exercise Program
- Devolution of Control and Direction
- Reconstitution Operations

3.12 Identify agency response resources and develop an inventory conforming to NIMS resource typing standards as identified by the NIC. Share additional resource typing information with the NIC. Resource information and databases should be shared with appropriate local, state, and regional EMAs.

3.13 Establish a common understanding with community, state, and federal jurisdictions of the capabilities and distinct types of emergency response personnel and other resources available. Develop resource lists for personnel, equipment and materials and other resources including contractor personnel and resources to support various incident types.

3.14 Identify resource needs and develop strategies to acquire resources in sufficient quantities as specified in the COOP to perform assigned mission and tasks.

3.15 Implement an effective logistics system to mobilize, track, use, sustain, and demobilize physical and human resources. The system must support both the residents in need and the teams that are responding to the incident.

4.1. Form a collaborative planning team by identifying and convening key stakeholders to develop and revise evacuation/shelter-in-place/quarantine plans. Include practitioners with past experience. Consider convening an initial meeting for transportation, transit, and emergency managers.

4.2 Engage the whole community in the planning process. Involve all jurisdictions (federal, state, local, tribal, county), transit agencies and other transportation providers, and regional organizations such as MPOs, Councils of Governments, planning organizations, regional incident response networks, Urban Area Security Initiatives; operators of critical infrastructure, state and local health agencies, schools, Community Based Organizations, Faith Based Organizations, NPOs, and private sector partners and contractors. Work with community leaders and representatives of existing groups and programs to leverage their contacts and networks, and build trusted relationships.

4.3 Perform risk assessment involving the identification of likely threats and hazards, and identifying goals and objectives, and guidelines for plan evaluation and updating. Assumptions should be used sparingly.

4.4 Select and develop scenarios and identify operational priorities. Scenarios should include prevention/protection elements, initial warning/development and determination of the course of action, specific impacts, response requirements, and response requirements as priorities. Also, identify the number and location of people, household
### Appendix A3 Prepare

<table>
<thead>
<tr>
<th>2. Establish protocols to communicate with employees and the general public.</th>
<th>PREPARE-05</th>
<th>Establish internal state transportation agency communications protocols.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5 Coordinate and manage roadways, monitor roadway status, incident response, fuel and services for self-evacues, vehicles transporting evacuees, and in-bound response vehicles. Identify primary and secondary evacuation/shelter-in-place/quarantine routes based on probability and feasibility of use, survivability, ease of restoration, functional service, and strategic location. Identify potential traffic, transit, intermodal, and interjurisdictional challenges and opportunities. Determine traffic management tactics for traffic management challenges and critical performance criteria of transportation network components. Designate routes and locations for ingress traffic and prestaged equipment materiel and personnel along the evacuation/shelter-in-place/quarantine routes, including fuel and personal relief facilities.</td>
<td></td>
<td>pets and service animals, and vehicles to be evacuated, sheltered-in-place, or quarantined.</td>
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<tr>
<td>4.6 Hold workshops as appropriate including at least one collaborative workshop on operational priorities and to establish goals and objectives.</td>
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<td>4.10 Document decision criteria to be monitored and evaluated prior to issuing an evacuation/shelter-in-place/quarantine order. Also, define specific criteria for voluntary, recommended, or mandatory evacuation/shelter-in-place/quarantine. Include pre-approved drafts of executive orders for evacuation/shelter-in-place/quarantine.</td>
</tr>
<tr>
<td>4.7 Develop and analyze courses of action by establishing the timeline, identifying decision points in each scenario, and identifying and depicting operational tasks.</td>
<td></td>
<td>4.11 Include a strategy for restricting and securing access to evacuated, sheltered-in-place, or quarantined areas.</td>
</tr>
<tr>
<td>4.8 Determine the resource gap by identifying available resources and necessary resources. Use NIMS/NIC resource typing definitions and NIMS resource management processes. Consider resources of all agencies and organizations with vehicles capable of use in evacuations; these resources include transit vehicles, school buses, ferries and private water craft, public and private vans and school buses, and aviation resources.</td>
<td></td>
<td>4.12 Prepare, review, and approve the plan. Ensure that the plan is adequate, feasible, acceptable, complete, and in compliance with applicable laws and official and regulatory requirements, and state and federal standards. Incorporate a process and schedule to update the plan.</td>
</tr>
<tr>
<td>4.9 Determine information and intelligence needs including interagency and interjurisdictional communications and public communications. Include provisions for communicating with limited English-speaking individuals and special needs populations. See TCRP Report 150 for information on developing a collaborative communication network to reach vulnerable populations. See Prepare Phases 5 and 6 for additional information regarding communications and media interface.</td>
<td></td>
<td>4.13 Perform exercises (at least tabletop) to test and validate the plan. Follow the HSEEP process to evaluate the exercises, debrief participants, and produce an After Action Report. Ensure that Corrective Actions identified in the After Action Report are tracked and implemented.</td>
</tr>
<tr>
<td>5.1 Evaluate use of radio channels, frequencies, trunked radio systems, and use of cellular and satellite phones during events likely to result in emergencies requiring activation of the State and/or Regional EOC(s).</td>
<td></td>
<td>5.2 Establish predetermined frequency assignments, lists of agency channel access, and interagency communication protocols. Establish and pre-position communications supply pods.</td>
</tr>
<tr>
<td>5.2 Establish predetermined frequency assignments, lists of agency channel access, and interagency communication protocols. Establish and pre-position communications supply pods.</td>
<td></td>
<td>5.3 Prepare an employee communication strategy, including emergency communication systems and materials for distribution in advance of events.</td>
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<tr>
<td>5.3 Prepare an employee communication strategy, including emergency communication systems and materials for distribution in advance of events.</td>
<td></td>
<td>5.4 Determine interagency communications procedures and state transportation agency traffic management team and other field team personnel to personnel communications procedures and field team personnel to EOC communications procedures.</td>
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<tr>
<td>5.4 Determine interagency communications procedures and state transportation agency traffic management team and other field team personnel to personnel communications procedures and field team personnel to EOC communications procedures.</td>
<td></td>
<td>5.5 Institutionalize, within the framework of the ICS, the</td>
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</table>
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Public Information System, comprising the Joint Information System (JIS) and a Joint Information Center (JIC). The Public Information System will ensure an organized, integrated, and coordinated mechanism to perform critical emergency information, crisis communications, and public affairs functions that are timely, accurate, and consistent. This includes training for designated participants from the Governor’s office and key state agencies.

5.6 Identify contingency plans if primary means of communications fail or are unavailable. Include provisions for keeping the public informed of the estimated travel times to safe havens under current and forecast conditions.

5.7 Develop formal relationships with Fusion Centers, non-transportation public safety, emergency, and security communities and procedures for secure communications of sensitive information including security threats.

5.8 Test, exercise/drill, and evaluate primary and contingency communications systems and plans on a regular basis.

5.9 Coordinate and support emergency incident and event management through use of integrated multiagency coordination systems (e.g., webEOC).

5.10 Develop interoperable voice, data, and video communications systems, tools, and processes to present consistent and accurate information to incident managers at all levels. Develop and maintain connectivity capability between local Incident Command Posts, local 9-1-1 centers, local EOCs, the SEOC, and regional and federal EOCs, FCS, and NRF organizational elements.

5.12 Make use of available communications equipment and assets of your state transportation agency, TMC, and MPO including reverse 9-1-1 emergency alert notification, hardwired and secure telephone lines with direct links to municipalities, 511 service, social media, website, etc. Sources of information include agency contacts, 511 service, webEOC, data from evacuation models, data from traffic cameras, weather data, GIS maps, traffic flow information including contraflow maps, social media, transit agencies and other transportation providers. Interact with regional incident management network (if one is available) to manage situational awareness efforts, leverage their communications resources, and collect, analyze, and disseminate incident information.

5.13 Establish calling trees and notification systems, including 24/7 event notification protocols.

5.14 State transportation agencies should promote incident response communications (during exercises and actual incidents and in field manuals and training) featuring plain language commands and consistent terminology so transportation employees will be able to function in a multi-jurisdiction environment.

5.15 Identify single points of contacts, with back-ups, in all jurisdictions and agencies for communications, including the protocols for which to contact under what conditions.

5.16 Define when evacuation personnel are to be notified of a possible evacuation/shelter-in-place/quarantine order prior to its execution.

5.17 Identify who needs to be informed to begin opening shelters.

5.18 Identify specific contingency plans to be used if conditions change during the course of the evacuation.

5.19 Standardize incident reporting and documentation procedures to enhance situational awareness and provide emergency management/response personnel with access to critical information. Ensure that personnel understand standard incident reporting and documentation procedures (e.g., Flash and Status reports, SITREPs).

6.1 Develop Media Interface Guidelines to ensure traveler and evacuation information and other emergency alerts are provided quickly and accurately to media outlets and the public. Ensure messages are consistent and comprehensive, and accessible to all populations including individuals with disabilities and functional needs.

6.2 Designate a single spokesperson, typically the

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Develop media interface and public notification systems. Note: These supporting actions are generally not the state transportation agency’s PIO during major incidents, but rather are through the JIC created by the state/local EOP.
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PIO, to provide information to the media and the public, and address inquiries. The PIO also gathers and coordinates messaging and information, and is responsible for media relations, rumor monitoring, and emergency public information and warnings.

6.3 Identify multiple communication tools to be used to ensure the community receives information regarding the steps to be taken to prepare for evacuation, the evacuation zone, the routes of evacuation, and location of nearby shelters. Multiple means of media delivery should be considered, including methods that can function without traditional power sources or the internet. An example includes the use of solar-powered CMS/DMS/VMS.

6.4 Develop agreements including Broadcast Radio Agreements with, and protocols and guidance for traffic reporting services in informing the public during incidents. Ensure that information is provided in a pre-established format within specific timeframes.

6.5 Develop public information campaign with pre-scripted public service announcements and messages and inform the media on their use.

6.6 Establish Cable Television Cooperative Agreements to provide information to targeted populations (e.g., local government channels).

6.7 Establish a process for using Highway Advisory Radio (HAR) AM stations to provide traveler information in the immediate vicinity of the transmitter.

6.8 Establish a process for using mass faxing/texting capability or email to send road closure information to trucking associations, truck stops, inspection and weigh stations, media outlets, and others.

6.9 Establish a process for leveraging available Federal and SLTT systems such as the Integrated Public Alert and Warning System (IPAWS), the Emergency Alert System (EAS), and the National Terrorism Advisory System.

6.10 Establish processes for using Advanced Traveler Information Systems (ATIS), including Internet, kiosk facilities, 5-1-1, and other publicized public information services to inform the public of travel conditions.

6.11 Establish a process for using DMSs to provide timely, accurate information in advance of, and at the scene of an incident.

6.12 Identify foreign language speakers and outlets to communicate with citizens and visitors who may not understand English.

6.13 Establish times for public officials to provide updates and inform the public of when they can expect such updates.

6.14 Ensure the state/territorial Public Information System can gather, verify, coordinate, and disseminate information during an incident. Accomplish this through exercises and drills of the system.

6.15 Use existing Public Information System and/or other communication systems for effective practices and technical aids.

6.16 Incorporate and evaluate these public information protocols and processes in interagency training and exercises. Address identified deficiencies.

3. Develop plans and procedures to manage traffic under emergency conditions.

| PREPARE-07 | Establish applicable transportation agency response and management teams. |

7.1 Establish traffic management teams to manage and direct traffic on highways, at critical intersections lacking active signalization, and contraflow operations, as needed.

7.2 Establish Hazmat response/disposal teams, debris removal teams, damage assessment teams with self-sustaining capabilities, and bridge assessment teams.

7.3 Pre-assign team members along with alternates. Ensure that team members are trained and qualified, and certified as necessary on equipment they will be using.

7.4 Ensure that equipment has been inspected and is in working order, and certified as required.

7.5 Provide teams with Personal Protective Equipment (PPE), training, and information packets including necessary forms, information about reimbursement programs and procedures and required documentation.

7.6 Establish additional teams, if necessary, to assist with other emergency response needs.

7.7 For each team, develop plans and procedures detailing when and how the teams will be deployed, how to maintain communications with the teams, and when and how to
Prepare traffic management performance measures.

8.1 Analyze traffic flow of evacuation/shelter-in-place/quarantine routes focusing on all freeways and major arterial roadways serving the route. Evaluate key performance measures such as speed, occupancy, and evacuation time. For evacuations, consider scale and patterns of movement, damaged infrastructure, and secondary incidents. Focus on egress and ingress operations separately. Avoid left-turn movements across traffic flow. Divert traffic flow from critical locations (e.g., Points of Dispensing sites in support of the strategic National Stockpile) and bottlenecks. TMCs can support this effort through the provision of necessary data, algorithms, and software. MPOs can provide modeling and analysis support and access to travel demand data.

8.2 Review transportation segments to establish capacity, evacuation/sheltered-in-place/quarantined population location distribution, potential sheltering and care destinations, distance between these locations, and parallel routes for each identified hazard.

8.3 Develop multiple local flow (feeder) routes connected to the main evacuation/shelter-in-place/quarantine routes as necessary to achieve optimum efficiency.

8.4 Test contraflow operations, including full set up and breakdown of traffic controls, safety equipment, and materials. Determine mobilization and demobilization times.

8.5 Identify user groups potentially affecting egress and ingress operations (e.g., regional through traffic, buses, truckers, other interstate travelers).

8.6 Review signal timing strategies and develop strategies to address identified hazards. They include: increasing intersection traffic handling capacity by minimizing the number of traffic signal phases; selecting an existing timing plan with longer cycle lengths; manual control of signal operations; a custom timing plan with alternate route movements; and a contingency plan with an extended phase or cycle to facilitate movement along the alternate route corridor. Consider use of automated systems (e.g., adaptive signal control technology, automated traffic signal performance measures) for traffic signal timing. TMCs can support these activities through the provision of necessary personnel, data, algorithms, and software.

8.7 Analyze potential bottlenecks, barriers, scheduled work zones, vehicle restrictions, vulnerabilities and other potential problems in advance to determine an emergency response and evacuation/shelter-in-place/quarantine route. Analyze impact of traffic signal timing and adjust as necessary. TMCs can support this effort through the provision of necessary personnel, data, algorithms, and software. MPOs can provide modeling and analysis support and access to travel demand data. Use FHWA’s Arterial Management Program for arterial management, traffic signal timing, and access management.

8.8 Develop countermeasures (e.g., shutting down work zones, suspending vehicle restrictions, suspending toll collections, adjusting/removing ramp metering) to address these issues. Also, develop procedures for real-time monitoring of emergency vehicle access routes and evacuation/shelter-in-place/quarantine routes.

8.9 Develop freeway interchange operations tactics to maximize ramp capacity and prevent evacuation route mainline congestion.

8.10 Control traffic and respond to traffic incidents through joint efforts among transportation, law enforcement, and emergency medical personnel. Use ETO/TIM best practices.

8.11 Assess/consider effectiveness of other transportation roadway actions, transit system actions, and transportation demand management actions described in Tool 3.4, NCHRP Report 740. Include promising actions in analysis/modeling/testing.

8.12 Perform outreach to special needs populations. Seek assistance from MPOs

8.13 Review/modify/suspend timing of drawbridge openings and lock downs.

9.1 Establish TMP/TTC plans for predefined severity levels.
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09  management plans and protocols to use during evacuation/shelter-in-place/quarantine and to respond to emergency events. and incident locations, and provisions for prepositioned equipment for response to emergency events and evacuations/shelter-in-place/quarantine. Plans should include emergency response access routes and alternate routes, and provisions for use of traffic control devices and alternate signal timing plans, and predesignated TCPs for intersections. Coordinate the designation of TCPs with state and local law enforcement. TTC plans should also include provisions for towing, recovery, and Hazmat response. Use information and data gathered in PREPARE Phase 08 to help develop the plans. Consult evacuation flowchart in Figure 4-2, NCHRP Report 740 for evacuation plans.

9.2 TTC plans should consider all transportation users including transit users and pedestrians as well as transit and railroad services, and dissemination of traveler information.

9.3 Consider all modes and networks in addition to highways, local roadways, and private vehicles including surface transit, commuter and regional rail, subways, light rail, ferries, taxis, vans and buses operated by non-transit entities, airplanes, and pedestrians. See Tool 3.3, NCHRP Report 740.

9.4 Address issues concerning the use of contraflow lanes. Issues include transition sections, ramps and crossover points, emergency turnarounds for emergency response providers, traffic control, access, merging, emergency access to transit and rail, use of roadside facilities, safety, labor requirements, and cost.

9.5 Establish predetermined staging areas and storage sites for each segment of the transportation corridor.

9.6 Develop travel-on-shoulder guidelines to ensure that highway shoulders are available for emergency use for response vehicles and general traffic, if necessary.

9.7 Establish closure and alternate route guidelines to guide implementation of closures and alternate routes using predetermined routes.

9.8 Establish rapid vehicle and debris removal guidelines including Hazmat response to ensure an efficient process for clearing roadways.

9.9 Establish landing zone guidelines and predetermined landing sites for MedEvac helicopters and traffic surveillance aircraft.

9.10 Develop traffic signal control plans to quickly implement alternative routes and close impacted lanes on the transportation corridor.

9.11 Establish protocols for communicating and coordinating with construction crews to support traffic control.

9.12 Identify traffic control techniques to provide clear guidance for incident traffic control and allow safe and efficient deployment of closures, detours, and alternative routes.

9.13 Identify corridors equipped with traffic signal preemption for use by emergency vehicles.

PREPARE-10  Coordinate with Neighboring Jurisdictions, Agencies, School Districts, Community Leaders, and Media.

10.1 Coordinate plans with neighboring jurisdictions (cities, counties, parishes) and agencies (transit, toll authorities, MPOs, seaports, airports, public safety) that may be affected by evacuation/shelter-in-place/quarantine and response operations. Also coordinate with local school districts, community leaders (business leaders, church/mosque/synagogue leaders, critical neighborhood leader), and media. The coordination effort should include identification of resources such as buses useful for mutual aid. Coordination activities include development of contacts and working relationships, regular meetings, and communication channels; and, MOUs and other interagency agreements. See NCHRP Report 740 for useful MOU templates. In addition, planned events, training and exercises, and efforts to obtain mutual aid provide opportunities for collaboration.

10.2 Share plans with higher government levels, as requests for additional resources may be necessary.

10.3 Coordinate state plans with neighboring states, as evacuees may travel to another state to seek shelter or mutual aid may be requested from another state.

10.4 States should look into creating interstate compacts that encompass all local jurisdictions.

10.5 Develop joint access management and corridor
management programs to improve traffic flow and alleviate congestion issues that may occur during the evacuation/shelter-in-place/quarantine.

10.6 Use the capabilities of regional organizations to assist in such coordination.

<table>
<thead>
<tr>
<th>PREPARE-11</th>
<th>Prepare to mobilize response teams, equipment and resources.</th>
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<tbody>
<tr>
<td>11.1</td>
<td>Activate mobilization plans and incident-specific deployment plans for emergency personnel, and plan and prepare for demobilization as well. (\text{Note that the plans should have been exercised, evaluated, and updated.}) Prior to activation, afford staff an opportunity to ensure the safety of their loved ones and personal property.</td>
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<tr>
<td>11.2</td>
<td>Bring all EOCs to fully functional status.</td>
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<tr>
<td>11.3</td>
<td>Use resource management best practices to determine necessary resources and ensure they are available to protect responders and those evacuated/sheltered-in-place/quarantined. Track and report resources through the ICS structure. Review Step Four and tools related to resources in tools 4.2.1 – 4.2.6 in NCHRP Report 740.</td>
</tr>
<tr>
<td>11.4</td>
<td>Verify that personnel have the appropriate training and qualifications to support response efforts.</td>
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<tr>
<td>11.5</td>
<td>Test all primary and backup wire communications and radio frequencies including remote communications expected to be used during the event, and evaluate contingencies.</td>
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<tr>
<td>11.6</td>
<td>Equip emergency personnel with needed equipment, supplies, and PPE. Provide them with information packets including ICS forms, reimbursement forms, permit waiver forms, etc.</td>
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<tr>
<td>11.7</td>
<td>Ensure vehicles and emergency equipment are fueled and in working order. Perform and document inspections.</td>
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<tr>
<td>11.8</td>
<td>Verify that traveler information systems are operational and prepared for use.</td>
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<tr>
<td>11.9</td>
<td>Place/assemble equipment and resources at predetermined locations.</td>
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<tr>
<td>11.10</td>
<td>Activate reception plans, sites, and support capabilities with public and/or volunteer organizations. Provide Just-in-Time training for all training needs that have not yet been met, including training for NGO representatives and volunteers as well as state transportation agency personnel.</td>
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<tr>
<td>11.11</td>
<td>Establish field capabilities through the ICS/Unified Command System.</td>
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<tr>
<td>11.12</td>
<td>Coordinate traffic signal systems across jurisdictions, clear all work zones, and ensure appropriate signage to support evacuation/shelter-in-place/quarantine efforts.</td>
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<tr>
<td>11.13</td>
<td>Prepare for required elements of the reimbursement process.</td>
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<tr>
<td>11.14</td>
<td>Use NIMS inter-jurisdictional and interagency information flow and coordination mechanisms.</td>
</tr>
<tr>
<td>11.15</td>
<td>Notify all response personnel of evacuation/shelter-in-place/quarantine orders according to established calling trees and communication protocols. Response personnel should report to staging areas and await order to begin response and evacuation efforts.</td>
</tr>
<tr>
<td>11.16</td>
<td>Ensure all responsible agencies understand joint priorities and restrictions.</td>
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<tr>
<td>11.17</td>
<td>Manage timely communication of instructions to prepare people in advance of the order to evacuate, shelter-in-place, or quarantine.</td>
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<tr>
<td>11.18</td>
<td>Verify that adequate support supplies are available for response personnel if it appears the response effort will last for an extended period of time.</td>
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<thead>
<tr>
<th>PREPARE-12</th>
<th>Administer training programs.</th>
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<tbody>
<tr>
<td>12.1</td>
<td>Establish employee and contractor training and exercise programs. Follow state EMA guidelines and schedules as appropriate. Establish professional qualifications, certifications, and/or performance standards for individuals and teams, whether paid or volunteer. Ensure that content and methods of training comply with applicable standards and produce required skills and measurable proficiency.</td>
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<tr>
<td>12.2</td>
<td>Incorporate NIMS/ICS into all state/territorial and regional training and exercises.</td>
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<tr>
<td>12.3</td>
<td>In general, training should progress from individuals to intra-agency teams to interagency and interjurisdictional exercises. Also, activities in training and</td>
</tr>
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exercise programs should progressively become more complex. Provide a chance for learners to reflect on their training. Then, provide opportunities to apply their new learning shortly thereafter.

12.4 Make training relevant, interactive and specific to real-world problems. Much learning can occur through instructor-student and student-student interactions. Acknowledge experience and knowledge by providing opportunities for participants to share information and practices.

12.5 Conduct a training needs assessment to determine the types of training along with certifications and credentialing required by job function or position. Include recovery and mitigation training needs as well as emergency response and preparedness. Include pertinent emergency management technologies such as situational awareness tools (e.g., webEOC), incident prediction and detection/warning systems, consequence prediction tools (e.g., CAPTA, FEMA’s HAZUS tool), PPE equipment and technologies, mapping systems, and advanced site investigation tools.

12.6 Identify internal and external requirements and mandates (HSEEP, EMPG) including training and exercise frequency, evaluation, and documentation; also, comprehensive training records should be maintained.

12.7 Recipients of EMPG funding should develop and maintain a progressive exercise program and a multiyear Training and Exercise Plan consistent with HSEEP.

12.8 Consider all employees at all levels with emergency preparedness and emergency management responsibilities, including training and exercise personnel, and their current and potential responsibilities. Employee categories include Maintenance and Operations personnel and supervision, personnel in the EOC, personnel in TMCs, transit agency personnel (drivers, dispatchers, law enforcement, support), traffic management teams, damage assessment teams, debris management teams, Hazmat response teams, etc. Also, senior management and elected and appointed officials require training.

12.9 Determine who (what positions) need NIMS Core Curriculum training; seek assistance from the NIC and state NIMS coordinator for additional guidance.

12.10 Consider including other emergency response providers such as police and fire departments, local public works agencies, and contractors. Establish procedures to provide Just-in-Time training for all training needs that have not yet been met, including training for NGO representatives and volunteers as well as state transportation agency personnel.

12.11 Identify what additional training resources may be needed in the community to support response and evacuation/shelter-in-place/quarantine activities.

12.12 Develop state DOT Multiyear Training and Exercise Plan (TEP) in close coordination with the state EMA; hold TEP Workshop to identify exercise priorities and determine schedule of planned exercises, which target groups and categories of personnel will be included, which exercise type will be used, and develop a structured testing schedule for plans.

12.13 Participate in joint multi-agency training and exercises; this should include an all-hazards exercise program based on NIMS that involves responders from multiple disciplines and multiple jurisdictions. Seek to participate in exercise planning to ensure the state transportation agency role is realistic.

12.14 Plan and implement individual exercises. Seek to include all stakeholders, particularly for emergency evacuation exercises. Review NCHRP Report 777, Tool 1 – Checklist of potential stakeholders. Also consult with your MPO for stakeholder lists and contacts. Review NCHRP Report 740, Tool 3.3 for Primary entities and transportation modes involved in evacuation.

12.15 Keep key officials, state EMA, and other stakeholders updated on exercise planning and progress. Seek their input as appropriate.

12.16 Always have a safety plan for exercises. Make provisions for stopping the exercise should a real-world incident occur.

12.17 Perform exercise design and development
Appendix A3 Prepare

activities including development of an Exercise Plan (see Appendix for an Exercise Plan Template), identification of planning team, identification of exercise objectives, scenario design, documentation creation, and logistics coordination.

12.18 Use drills/exercises to evaluate emergency traffic management plans and identify traffic and other transportation impacts of route closures, detours, contralflow operations.

12.19 Use drills/exercises to estimate time needed to mobilize field personnel and equipment to support an evacuation/shelter-in-place/quarantine. Also estimate the time needed for demobilization, and provide this information to highway, public safety, and transit agencies for coordination purposes. Simulations can supplement these estimates.

12.20 Use drills/exercises to evaluate preparedness plans; internal/external/public communications procedures and systems and practice their mobilization; secure interagency communications and procedures and handling/communication of sensitive information; regional interagency coordination, mutual aid, communications and information sharing protocols; resource tracking procedures; recovery procedures including reimbursement, damage assessment, and documentation procedures; and continuity of operations procedures.

12.21 Conduct the exercise by preparing for exercise play and managing the exercise.

12.22 Conduct post-exercise debriefings to determine lessons learned during the exercise.

12.23 Start evaluation planning and fill key evaluation roles at the start of the exercise planning process. Create an Exercise Evaluation Guide to document performance of personnel, plans, procedures, equipment and facilities against exercise objectives, and to highlight strengths and weaknesses. Assess exercises on the task level, organization level, and mission level. Evaluators should evaluate only their own agency, profession, and jurisdiction.

12.24 Ensure that all personnel with a direct role in emergency preparedness and incident management or response complete the designated FEMA training.

12.25 Hold an After Action Report meeting, and develop and share After Action Reports (AARs) with stakeholders. AARs highlight strengths and weaknesses observed during the exercise. Remember to document the AAR development process. Review tool 6.2-6.6 of NCHRP Report 740 for helpful forms, templates, and information.

12.26 The Improvement Plan or Corrective Action Plan contains actions, responsible parties, target dates, budgets, and reporting procedures for actions taken.

12.27 Track Corrective Actions to completion.

12.28 Incorporate results of training exercises, including corrective actions, into preparedness response plans and procedures. Also, incorporate relevant findings into the agency’s training and exercise program.

12.29 Analyze performance trends and results across exercises and take necessary action to support continuous improvement of training and exercises and other preparedness initiatives.

12.30 Review exercise and training TEP schedule to identify and address potential issues.

12.31 Combine emergency management and TIM training and exercises as appropriate. Ensure that personnel understand and know how to implement emergency and incident management joint protocols and procedures. Refer to TIM Self-Assessment checklist for Strategy 2: Develop and Implement Coordinated Protocols, Procedures, and Training.

12.31 Leverage training facilities to coordinate and deliver NIMS training requirements in conformance with the NIMS National Standard Curriculum. Establish partnerships and leverage training and exercises provided by other agencies and organizations including the state EMA, DHS/FEMA, state and local responders, FHWA/NHI, LTAP/TTAP, universities and colleges, etc.

5. Ensure cost tracking and accountability.

PREPARE-13 Prepare for cost accounting and tracking of expenditures.

13.1 Ensure processes have been developed to track resources, ensuring applicable reimbursement and accountability for compliance with mutual-aid provisions.
<table>
<thead>
<tr>
<th>Appendix A3 Prepare</th>
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<tbody>
<tr>
<td>13.2 Regularly coordinate and communicate with FHWA, FEMA, and the state EMA along with local public agencies and key stakeholders.</td>
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<tr>
<td>13.3 Institute good business, accounting, and management practices, and align processes with federal and state requirements as much as possible. For example, use unique project codes for disasters and use electronic storage for documentation in central location/drive.</td>
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<tr>
<td>13.4 Leverage technologies such as electronic signatures, asset management and modeling tools, situational awareness technologies, weather sensors/Road Weather Information Systems, automated van to capture post-disaster roadway damages along with pre-disaster conditions, GPS/AVL and fleet management systems, and, where possible, incorporate into daily operations.</td>
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<tr>
<td>13.5 Be aware of new legislation and changes in FHWA and FEMA guidance. Always use the most up-to-date guidance and manuals.</td>
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<td>13.6 Predesignate reimbursement coordinators and damage assessment teams.</td>
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<td>13.7 Conduct premobilization inspection of vehicles and equipment.</td>
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<td>13.8 Pre-prioritize routes and locations for assessment.</td>
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<td>13.9 Map historic damages to show repetitive losses.</td>
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<td>13.10 Provide training and exercises to all personnel involved in reimbursement. Use scenarios from past disasters. Train state EMA staff and local public agencies on reimbursement procedures.</td>
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<tr>
<td>13.11 Develop and use Checklists to determine eligibility for reimbursement programs.</td>
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<td>13.12 Develop administrative packets with forms including ICS forms, damage assessment forms, and emergency waivers for distribution to appropriate personnel during an emergency.</td>
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<tr>
<td>13.13 Incorporate lessons learned in After Action Reports from exercises and actual disasters to improve reimbursement processes.</td>
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<tr>
<td>13.14 Establish good emergency contracting practices including pre-screening of contractors and emergency waivers.</td>
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<tr>
<td>STEPS</td>
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<tr>
<td>1. Initiate emergency response.</td>
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<tr>
<td>2. Address emergency needs and requests for support.</td>
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</table>
that is integrated through the ICS and communicated and coordinated with the TMC.

4.9. Activate logistics systems and venues to receive, stage, track, and integrate resources into ongoing operations. ICS should continually assess operations and scale and adapt existing plans to meet evolving circumstances.

4.10. Address emergency responder transportation needs and scene access support and staging requirements.

4.11. Identify available transportation equipment, facilities, Personnel, devices, and information to support emergency response.

4.12. Assign transportation agency resources to move materials, personnel, and supplies as requested by responders.

4.13. Track resource status. If appropriate, support hazardous materials containment response and damage assessment using available capabilities, and coordinate with on-scene field response through the ICS.

4.14. Ensure that nonhazardous materials, particularly small vehicle fluid spills, are removed from the transportation facility—initially travel lanes/tracks—as quickly as possible.

4.15. Attend regular briefings at the incident site on the situation, incident action plan, response objectives, and strategy, with full opportunity for transportation contributions and identification of resources and capabilities to support the response effort and action plan.

4.16. Perform damage assessment responsibilities for affected transportation system elements.

4.17. Make/recommend decisions regarding closures, contraflow operations, restrictions, and priority repairs.

4.18. Coordinate assessments and decisions made regarding the operational capabilities of the transportation system with affected parties (emergency responders; local, state, and federal government, etc.) and initiate priority clean-up, repair, and restoration activities, including the use of contractors and emergency procurement authorities.

4.20. Review and, as necessary, terminate existing work zone activities and/or closures to the extent possible.

4.21. Obtain incident status briefings and anticipate changing conditions (wind direction, weather, plume direction, etc.).

5.1. Evaluate the need for additional assistance from neighboring states, jurisdictions, and/or the federal government.

5.2. If the incident overwhelms state and mutual-aid resources, the governor should request federal assistance and/or deploy the State Department of Military/National Guard.

6.1. Determine the probability of impact (depending on the nature of event).

6.2. Estimate the effects on the geographic area and classes of people and materials to be evacuated/sheltered-in-place/or quarantined.

6.3. Consider the timing of the event and lead time to initiate evacuation, shelter-in-place, or quarantine.


6.5. Evaluate the economic impacts of evacuation/shelter-in-place/or quarantine to the public and private sectors.

6.6. Determine the condition and availability of evacuation routes or shelter-in-place or quarantine control points.

6.7. Determine whether neighboring jurisdictions have made evacuation/shelter-in-place/quarantine decisions.

6.8. Determine the population potentially affected by the evacuation, shelter-in-place, or evacuation, including jurisdictions that will host those evacuated or quarantined.

6.9. Determine the availability and safety of personnel to support the evacuation/shelter-in-place/quarantine.

6.10. Determine whether to deploy separate teams to notify residents and ensure their evacuation/shelter-in-place, or use other means to notify people in quarantined areas.
### Appendix A3 Respond

| RESPONSE-07 | 6.11. Consider the personal needs of those evacuated/sheltered-in-place/quarantined and the need for vehicle servicing, particularly fuel.  
6.12. Consider whether to terminate power and other utilities for safety.

| RESPONSE-08 | Take response actions.  
8.1. Implement ICS and chain of command and/or UC to create an integrated team of multidisciplinary and multi-jurisdictional stakeholders.  
8.2. Implement primary and (as needed) secondary command posts.  
8.3. Deploy transit resources to support evacuation including accommodating vulnerable populations evacuated/sheltered-in-place/quarantined.  
8.4. Deploy resources to accommodate pets on transit vehicles and/or in shelters.  
8.5. Enforce evacuation/shelter-in-place/quarantine order. The Emergency Operations Team should engage public safety officials in going door-to-door to ensure residents know of an evacuation/shelter-in-place/quarantine order and are complying.  
8.6. Place en route services along evacuation/shelter-in-place/quarantine route.  
8.7. Arrange for emergency services within the shelter-in-place/quarantine area as needed.  
8.8. Open evacuation routes to maximize throughput (i.e., close toll operations, work zones).  
8.10. Determine the need for and deploy emergency medical and other support staff staged along the evacuation routes or attached to those working with vulnerable populations, or within or near the shelter-in-place/quarantine area.  
8.11. Determine the need for and deploy debris-removal crews to clear blocked highways and/or other transportation facilities.  
8.12. Determine the need for and as needed deploy sanitation crews with mobile comfort stations (e.g., portable toilets, wash are as).  
8.13. Coordinate local evacuation/shelter-in-place/quarantine incident action plans with the designated incident commander in the field and the EOC/TMC.  
8.14. Field and EOC commanders should coordinate evacuation/shelter-in-place/quarantine incident action plans with neighboring jurisdictions and the state or neighboring state(s).  
8.15. EOC should obtain updated information frequently and communicate this information to those evacuated/sheltered-in-place/quarantined throughout the event.  
8.16. Set up contraflow operations and continue to monitor contraflow operations to ensure evacuation traffic is flowing safely and efficiently.

| RESPONSE-09 | Deploy response teams.  
9.1. Deploy personnel and field equipment.  
9.2. Ensure field personnel make frequent contact with the EOC through the ICS.  
9.3. Address activation of the TMC if it is not already operational (e.g., during normally inactive periods).

| RESPONSE-10 | Communicate evacuation/shelter-in-place/quarantine order and incident management measures.  
10.1. Brief national, state, and local authorities and personnel (such as transit and health agencies and FCs) at regular intervals to ensure all parties are provided with accurate, timely, and comprehensive information.  
10.2. Hold regular media briefings to inform the media about evacuation routes, traffic and road conditions, shelter/shelter-in-place/quarantine locations, and other pertinent information to communicate to the public in a timely manner.  
10.3. Disseminate accurate information pertaining to evacuation/shelter-in-place/quarantine orders in a clear fashion and timely manner to avoid shadow or unnecessary evacuations or unnecessarily lengthy evacuation trips.  
10.4. Implement a briefing schedule with ranking representatives from each stakeholder agency participating in the event.  
10.5. Inform evacuees of available transport modes, how to access them and if there are any restrictions on what evacuees may carry with them.  
10.6. Inform evacuees of when transportation assistance will begin, end, and the frequency of departure at designated pick-up locations.  
10.7. Inform evacuees of their destination before they board public transport.  
10.8. Inform the public and/or family members of the evacuees’ destinations.  
10.9. Identify established websites, hotlines, text messaging groups, etc., where people can get answers to their questions and concerns.
10.10. In the event of a shelter-in-place or quarantine, inform people of the nature of the danger and actions they should take.
10.11. Address communicating security measures to the public.
10.12. Identify support services for vulnerable populations.
10.13. Communicate critical operational changes to the EOC and the public.
10.14. Communicate information to evacuees on the availability of nonpublic shelters, such as hotels.
10.15. Keep shelter operations informed of the location and status of other shelters.
10.16. Regularly reinforce, internally and externally, that persons involved in any way with the evacuation/shelter-in-place/quarantine must direct all but the most basic inquiries to the JIC.
10.17. Personnel working on the evacuation/shelter-in-place/quarantine must maintain effective communications at all times to coordinate movements, share real-time information, and track deployments.
10.18. Establish processes to ensure redundant communications systems are available during the evacuation/shelter-in-place/quarantine because the event may damage or disable primary communication systems.
10.19. Program DMSs, permanent and portable, as necessary to provide accurate, up-to-date information.
10.20. Program HAR subsystems to provide accurate, up-to-date information.
10.21. Program 5-1-1 systems to provide accurate, up-to-date information.
10.22. Relay traffic condition information to the EOC.
10.23. Ensure 9-1-1 operators are fully informed of conditions so they can respond to callers with accurate, up-to-date information.
10.24. Use ITS resources during an evacuation/shelter-in-place/quarantine to collect data and as a tool to communicate and coordinate with those evacuated/sheltered-in-place/quarantined, evacuation operations personnel, partners, and other stakeholders.
10.25. In a shelter-in-place or quarantine area, use ITS to detect unnecessary movements that might result in innocent people being further jeopardized.

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<tbody>
<tr>
<td>11.1. Monitor traffic conditions on evacuation/shelter-in-place/quarantine reentry routes and make operational adjustments to maximize throughput.</td>
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<td>11.2. Monitor how the event that triggered the evacuation/shelter-in-place/quarantine is progressing and if there are any changes to earlier predictions of its effects.</td>
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<tr>
<td>11.3. Monitor the conditions of the roadway (e.g., for debris or flooding) so that those evacuated/sheltered-in-place/quarantined can be prepared and rerouted if necessary.</td>
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<td>11.4. Monitor evacuation/reentry operations of motorized transport, rail, air, waterway, and other modes of transportation to determine the adequacy of available resources.</td>
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<tr>
<td>11.5. Track the destination of vulnerable populations evacuated/sheltered-in-place/quarantined to notify friends and family of their location and to develop a plan to return them to their original locations once the area has been deemed safe for reentry.</td>
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<tr>
<td>11.6. Monitor the number of those evacuated/sheltered-in-place/quarantined and those moved by means other than personal vehicles to ensure that additional equipment and operators (such as buses and drivers or helicopters and pilots) are requested and supplied quickly if needed. This information should also aid in developing the reentry plan, as the same transportation resources will likely be required for that operation.</td>
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<tr>
<td>11.7. Monitor traffic counters and cameras.</td>
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<td>11.8. Monitor pipelines, viaducts, etc., for potential damage.</td>
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<thead>
<tr>
<th>6. Conclude response.</th>
<th>RESPOND- 12</th>
<th>Prepare for next operational period.</th>
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<tbody>
<tr>
<td>12.1. Mobilize personnel and resources for the next operational period.</td>
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<tbody>
<tr>
<td>13.1. &quot;Prepare for restoration of normal activities.&quot;</td>
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<td>13.2. &quot;Ensure provisions to address and validate the safe return of resources to their original locations exist.&quot;</td>
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<tr>
<td>13.3. &quot;Develop processes for tracking resources and ensuring applicable reimbursement.&quot;</td>
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<tr>
<td>13.4. &quot;Develop plans to ensure responder safety during demobilization efforts.&quot;</td>
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<tr>
<td>13.5. &quot;Ensure accountability for compliance with mutual-aid provisions.&quot;</td>
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<tr>
<td>STEPS</td>
<td>PHASE: RECOVER</td>
<td>ACTION ITEM</td>
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<tr>
<td>1. Restore Traffic to affected area.</td>
<td>RECOVER-01</td>
<td>Restore essential services.</td>
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<td>RECOVER-02</td>
<td>Reestablish traffic management in affected area.</td>
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<td></td>
<td>RECOVER-03</td>
<td>Allow reentry into affected area and/or remove shelter-in-place or quarantine restrictions.</td>
</tr>
</tbody>
</table>
3.26. Establish alternative plans for return in case the evacuation/shelter-in-place/quarantine lasts for days, weeks, or possibly longer.
3.27. Ensure operators and passengers have picture identifications to return to their points of origin.
3.28. Coordinate reentry plans with transportation and public safety officials to staff reentry routes adequately.
3.29. Coordinate operations to identify missing persons who might not have evacuated/sheltered-in-place/ quarantined and been lost in the event or failed to return after the event, particularly children separated from their families.

**RECOVER-04**

Conduct emergency repairs.

4.1. Develop an approach to infrastructure repair/replacement and decontamination, determining what can be done quickly and what will require more time.
4.2. Identify rebuild vs. relocate criteria. Consider infrastructure condition, e.g. planning to replace infrastructure identified as marginal or inadequate.
4.3. Determine repair/rebuild priorities. Assess impact on network, e.g. repairable structures that restore most of the lost regional networks given high priority.
4.4. Identify equipment required and contractor resources. Maintain fresh list of potential specialized equipment suppliers.
4.5. Make design decisions as soon as possible to minimize recovery time. Some decisions can be made before an event, such as what design strategies to take when rebuilding or replacing existing infrastructure.
4.6. Major repair or replacement construction typically requires contracting for engineering and contractor services. Have a prequalified list of engineers and contractors to contact to expedite this process.
4.7. Establish emergency contracting protocols in advance.
4.8 Identify locations for positioning of supplies and heavy equipment.
4.9. Identify right of way (air space/land) for staging areas.

2. Identify and implement lessons learned.

**RECOVER-05**

Perform After-Action Review and After-Action Reports.

5.1. Identify who is responsible for conducting After-Action Reviews and for ensuring necessary changes are made to plans and SOPs and communicated to staff.
5.2. Conduct a review of how the evacuation/shelter-in-place/ quarantine was executed and determine how it could have been improved. Each agency should review its actions. When multiple agencies are involved in an evacuation/shelter-in-place/quarantine, conduct a joint After-Action Review to address how well agencies worked together and what improvements can be made in future joint operations.
5.3. Each After-Action Review should be shared with decision makers and agency personnel and should include recommendations for improvements that should be considered and implemented quickly.
5.4. Conduct an after-action review, a formal meeting of operation participants to assess actions, determine follow-up items, and develop recommendations for improving future operations.
5.5. Results of the after-action review and individually submitted After-Action Reviews should be combined for a jurisdiction’s or agency’s final report.
5.6. Use After-Action Review s and After-Action Reports to determine if changes should be made to plans and procedures.

**RECOVER-06**

Return to readiness.

6.1. Establish a policy for the evacuation/shelter-in-place/quarantine team members’ home organizations regarding recovery time and time to participate in After-Action Reviews and other return-to-readiness activities.
6.2. Determine what equipment and supplies need to be restocked.
6.3. Determine what infrastructure needs to be repaired or replaced.
6.4. Determine what new information needs to be communicated to the public to maintain their awareness to be prepared.
6.5. Begin transitioning the system from an operations cycle back to a state of planning and preparedness.
6.6. Continue data collection and begin analyses of response activities.
6.7. Identify evacuation costs and reimbursable expenditures. Account for services such as equipment rehabilitation, restocking of expendable supplies, transportation to original storage or usage locations, overtime costs for public safety and transportation officials, materials used in support of evacuation, and contract labor and equipment.
6.8. Begin request for reimbursement processes from state and federal governments as applicable.
6.9. Implement a system to track personnel, supplies, and equipment costs to meet the requirements of the reimbursing agencies.
6.10. Work with FEMA and FHWA to ensure proper documentation is being used before submitting reimbursement requests.
Appendix A4: Checklist of Potential Transportation Assets (High Level)

Wherever possible, inventory assets, especially those that will be critical to assess during a disaster or emergency. In most cases, transportation asset management systems will have good records of locations and conditions of transportation assets.

<table>
<thead>
<tr>
<th>Potential Assets</th>
<th>Asset Identifier</th>
<th>Emergency/Disaster</th>
<th>Planned Event</th>
<th>Does Not Apply</th>
<th>Comments/Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aviation</td>
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<td>Aircraft</td>
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<td><strong>Air traffic control systems</strong></td>
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<td><strong>Airports</strong></td>
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<tr>
<td>-Commercial</td>
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<td>-Military</td>
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<tr>
<td>-Other</td>
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<td><strong>Highway Infrastructure and Motor Carrier</strong></td>
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<td><strong>Bridges</strong></td>
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<td><strong>Tunnels</strong></td>
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<td><strong>Roadways</strong></td>
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<td><strong>Bike paths</strong></td>
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<td><strong>Sidewalks</strong></td>
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<td><strong>Vehicles</strong></td>
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<td>-Automobiles</td>
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<tr>
<td>-Trucks carrying hazardous materials</td>
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<tr>
<td>-Other commercial freight vehicles</td>
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<tr>
<td>-Motorcycles</td>
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<td>-Motor coaches</td>
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<td>-School buses</td>
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<td>-Bicycles</td>
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<td><strong>Maritime</strong></td>
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<td><strong>Ports</strong></td>
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<td><strong>Ferries</strong></td>
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<td><strong>Waterways</strong></td>
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<td><strong>Coastline</strong></td>
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<td><strong>Intermodal landside connection facilities</strong></td>
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Appendix A4: Checklist for Inter-Agency Communications and Information Sharing

Step 1: Assess the initial incident using available information.

<table>
<thead>
<tr>
<th>Incident Description</th>
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Nature of Incident/
Type of Danger
(describe briefly)

<table>
<thead>
<tr>
<th>Situation Category (check all that apply)</th>
<th>Shelter-in-Place</th>
<th>Selective Evacuation</th>
<th>Phased Release Evacuation</th>
<th>Full Evacuation</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Shelter-place</em></td>
<td>_Selective evacuation</td>
<td>_Phased release</td>
<td>_Full evacuation</td>
<td></td>
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<tr>
<td><em>Quarantine</em></td>
<td>_Multiple locations</td>
<td>_Widespread</td>
<td></td>
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</tr>
<tr>
<td><em>Official expedited commute</em></td>
<td>_Major transit disruption</td>
<td>_power failure</td>
<td></td>
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</tr>
<tr>
<td><em>Other major trans. Facility closure</em></td>
<td></td>
<td>_Military, police, gov't action</td>
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</tbody>
</table>

Time of Day/ Day of Week

<table>
<thead>
<tr>
<th>Wind speed/ direction</th>
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<tr>
<th>Warning Time</th>
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<thead>
<tr>
<th>Expected Duration</th>
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</tbody>
</table>

STEP 2: Based on that information, determine what agencies and jurisdictions should be involved in communication activities.

<table>
<thead>
<tr>
<th>Initial Discovery Stage Communications</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interjurisdictional Information exchange: Is there a need for communications across jurisdictions within transportation? If yes, confirm details, below, and prepare fill in the types of transportation information in Step 3.</td>
<td></td>
</tr>
<tr>
<td>Need for one-on-one calls/communications? With whom?</td>
<td></td>
</tr>
<tr>
<td>Need for conference call(s) across transportation agencies? If yes: Determine lead agency</td>
<td></td>
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<tr>
<td>Who initiates call?</td>
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<tr>
<td>Who participates in call?</td>
<td></td>
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<tr>
<td>When will initial call take place?</td>
<td></td>
</tr>
<tr>
<td>Cross-functional Information exchange: Is there a need for communications within jurisdictions across functions-transportation, EMA, law enforcement, other? If yes, fill in the types of transportation information in Step 3.</td>
<td></td>
</tr>
</tbody>
</table>
### Step 3: Identify and collect the types of transportation information to be shared.

<table>
<thead>
<tr>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>About the incident – see Step. I</td>
<td></td>
</tr>
<tr>
<td>About the transportation system</td>
<td></td>
</tr>
<tr>
<td><strong>Roadway Status</strong></td>
<td></td>
</tr>
<tr>
<td>· Limited closures (list if possible)</td>
<td></td>
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<tr>
<td>· Extensive closures (describe briefly)</td>
<td></td>
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<tr>
<td>· Other</td>
<td></td>
</tr>
<tr>
<td><strong>Rail System Status</strong></td>
<td></td>
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<tr>
<td>· Limited closures (list if possible)</td>
<td></td>
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<tr>
<td>· Extensive closures</td>
<td></td>
</tr>
<tr>
<td>· Other</td>
<td></td>
</tr>
<tr>
<td><strong>Bus Transit System Status</strong></td>
<td></td>
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<tr>
<td>· Limited closures (list if possible)</td>
<td></td>
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<tr>
<td>· Extensive closures</td>
<td></td>
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<tr>
<td>· Other</td>
<td></td>
</tr>
<tr>
<td><strong>Other Transportation Status</strong></td>
<td></td>
</tr>
<tr>
<td>· Limited closures (list if possible)</td>
<td></td>
</tr>
<tr>
<td>· Extensive closures</td>
<td></td>
</tr>
<tr>
<td>· Other</td>
<td></td>
</tr>
<tr>
<td><strong>Potential actions to be taken</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Potential recommendations to decision makers</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Initial Transportation input through Information and Planning function</strong></td>
<td></td>
</tr>
<tr>
<td>for Media &amp; Communications Outreach (External Relations) general public message, and to Community Partners Communications Network (if active)</td>
<td></td>
</tr>
<tr>
<td><strong>Confirm time for next call</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Other issues</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Step 4: Identify what information is to be provided and what information is needed from the expected participants.

<table>
<thead>
<tr>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Information needed from decision makers</td>
<td></td>
</tr>
<tr>
<td>2. Information needed from federal agency representatives</td>
<td></td>
</tr>
<tr>
<td>3. Information to provide to decision makers</td>
<td></td>
</tr>
<tr>
<td>4. Information to provide to federal agency representatives</td>
<td></td>
</tr>
<tr>
<td>5. Information needed about populations with access and functional needs through the communications network (e.g., transportation needed)</td>
<td></td>
</tr>
<tr>
<td>6. Critical information to share with NGOs, CBOs and other community partners to pass on to general public and their constituents (e.g., areas that are not in danger, preferred evacuation routes, transit collection)</td>
<td></td>
</tr>
</tbody>
</table>
Step 4: Identify what information is to be provided and what information is needed from the expected participants.

| points |  
|-------|-------------------|
| 7. Other issues |  

Step 5: Determine whether emergency management has updated its orders or directions since the initial assessment.

<table>
<thead>
<tr>
<th>EMA Direction - as appropriate</th>
<th>Perimeter of Affected Area</th>
<th>Surrounding Affected Area</th>
<th>Rest of Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shelter In Place</td>
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<tr>
<td>Selective Evacuation</td>
<td></td>
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<tr>
<td>Staged or Phased Evacuation</td>
<td></td>
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<tr>
<td>Full Evacuation</td>
<td></td>
<td></td>
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<tr>
<td>No danger anticipated /&quot;Watch and Wait&quot;</td>
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<td></td>
<td></td>
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<tr>
<td>No action</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Anticipated/Actual Federal Actions</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Update to public and community partners needed?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comments</td>
<td></td>
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</tbody>
</table>

Step 6: Prepare for the next cycle of information sharing and exchanges.

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation information exchange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Update on incident</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Status of transportation system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Update on agency preparedness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Coordination needed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Additional strategies to consider</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Recommendations to decision makers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Define updated Transportation input through Information and Planning for External Affairs and Community Partners general public message</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Confirm time for next call</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Other issues</td>
<td></td>
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</tbody>
</table>

Step 7: Based on emerging and updated information, identify what is to be provided to and what is needed from the expected participants.

<table>
<thead>
<tr>
<th>Description</th>
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<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>1. Information needed from decision makers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Information needed from state and/or federal agency representatives</td>
<td></td>
<td></td>
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<tr>
<td>3. Information to provide to decision makers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Information to provide to state and/or federal agency representatives</td>
<td></td>
<td></td>
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<tr>
<td>5. Information needed from community partners</td>
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</tbody>
</table>
### Step 8: Preparing for Re-entry

<table>
<thead>
<tr>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation information exchange</td>
<td></td>
</tr>
<tr>
<td>1. Status of transportation system</td>
<td></td>
</tr>
<tr>
<td>2. Coordination needed</td>
<td></td>
</tr>
<tr>
<td>3. Strategies to consider - staging, controls</td>
<td></td>
</tr>
<tr>
<td>4. Recommendations to decision makers</td>
<td></td>
</tr>
<tr>
<td>5. Define updated Transportation input through</td>
<td></td>
</tr>
<tr>
<td>Information and Planning for External Affairs</td>
<td></td>
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<tr>
<td>and Community Partners general public message</td>
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</tbody>
</table>

### Step 9: Coordinating Information Across all Jurisdictions and Disciplines for Re-Entry

<table>
<thead>
<tr>
<th>Description</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>1. Information needed from decision-makers</td>
<td></td>
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<tr>
<td>2. Information needed from state and/or federal agency representatives</td>
<td></td>
</tr>
<tr>
<td>3. Information to provide to decision makers</td>
<td></td>
</tr>
<tr>
<td>4. Information to provide to state and/or federal agency representatives</td>
<td></td>
</tr>
<tr>
<td>5. Information needed from community partners</td>
<td></td>
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<tr>
<td>6. Information to provide to public and community partners</td>
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<tr>
<td>7. Other issues</td>
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</tbody>
</table>

### Step 10: Follow-up communication

<table>
<thead>
<tr>
<th>Description</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Set schedule for communicating updates</td>
<td></td>
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<tr>
<td>After action evaluation</td>
<td></td>
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<tr>
<td>· Assess interjurisdictional communication</td>
<td></td>
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<tr>
<td>· Assess cross-functional communication</td>
<td></td>
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<tr>
<td>· Assess adequacy of information provided</td>
<td></td>
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<tr>
<td>Complete After-Action Report (separate tool)</td>
<td></td>
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</tbody>
</table>
Appendix A4 Checklist for Emergency Events Affecting Multiple Jurisdictions, Transportation, And Interdependencies

1. Review and discuss events that could impact the region. Indicate likelihood and consequences, and note if it absolutely does not apply to the region. Review and discuss the transportation consequences of such an event and potential ripple effects.

2. Review and update throughout the planning process with planning partners. Use to trigger thinking about consequences to infrastructure and people, what responses might be required, and additional partners who may be needed.

3. Review and discuss whether a planned special event would be a good test of the types of coordination, communication, and operational strategies that would be needed in an emergency event (i.e., could a planned special event help exercise this type of event?)

4. Review and discuss whether such an event would be more likely in tandem with a planned special event (e.g., human-caused institutional acts) or have a greater consequence if it were to occur concurrent with a planned special event.

5. Review and discuss when planning regional exercises – tabletop to full-scale – to identify scenarios.

Example Resources:

1. Local emergency plans
2. FEMA HAZUS- method for estimating losses from disasters
3. FEMA- Flood zone maps
4. UASI/other risk assessments
5. Sea Lake and Overland Surges from Hurricanes (SLOSH)- National Hurricane Center – estimate/model storm surge heights
6. Local Nuclear Power Plant emergency plans
<table>
<thead>
<tr>
<th>Potential Hazards</th>
<th>Likelihood (High/Medium/Low)</th>
<th>Consequence (High/Medium/Low)</th>
<th>Potential Regional Transportation Impact (High/Medium/Low)</th>
<th>Does Not Apply</th>
<th>Can be exercised with a planned special event? (Y/N)</th>
<th>Greater likelihood or consequence with a planned special event? (Y/N)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural Hazards</strong></td>
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<tr>
<td>Earthquakes</td>
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<tr>
<td>Floods</td>
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<td>Storm surge</td>
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<td>Hurricane/typhoon</td>
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<td>Ice storms</td>
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<tr>
<td>Snow storms and blizzards</td>
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<tr>
<td>Landslides/mudslides</td>
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<td>Naturally occurring epidemics/pandemics</td>
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<td>Tornado</td>
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<td>Tsunami</td>
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<td>Volcanic eruption</td>
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<td>Wildfire</td>
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<td><strong>Human-Caused Intentional</strong></td>
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<tr>
<td>Bomb threats and other threats of violence</td>
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<td>Fire/arson</td>
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<tr>
<td>Riot/civil disorder</td>
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<tr>
<td>Sabotage: External and internal actors</td>
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<td>Security breaches</td>
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<tr>
<td>Cyber attack</td>
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<td>Terrorist assault using explosives, firearms or conventional weapons</td>
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<tr>
<td>War</td>
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<td>Workplace violence</td>
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<td>Potential Hazards</td>
<td>Likelihood (High/ Medium/ Low)</td>
<td>Consequence (High/ Medium/ Low)</td>
<td>Potential Regional Transportation Impact (High/ Medium/ Low)</td>
<td>Does Not Apply</td>
<td>Can be exercised with a planned special event? (Y/N)</td>
<td>Greater likelihood or consequence with a planned special event? (Y/N)</td>
<td>Comments</td>
</tr>
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<tr>
<td>Human-Caused Unintentional</td>
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<tr>
<td>Accidental contamination or hazardous materials spill</td>
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<tr>
<td>Accidental damage to or destruction of physical plant and asset</td>
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<tr>
<td>Accidents that affect the transportation system</td>
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<td>Gas outages</td>
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<tr>
<td>HVAC System failures or malfunctions</td>
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<td>Inappropriate training on emergency procedures</td>
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<td>Power outages</td>
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<tr>
<td>Software/hardware failures or malfunctions</td>
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<tr>
<td>Unavailability of key personnel</td>
<td></td>
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<tr>
<td>Uninterruptible Power Supply (UPS) failure or malfunction</td>
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<td>Voice and data telecommunications failures or malfunctions</td>
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<tr>
<td>Water outages</td>
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</table>
### Appendix A4 Multi-Jurisdiction Multimodal Evacuation Planning Checklists

<table>
<thead>
<tr>
<th>1.2</th>
<th>Plan Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2.1</td>
<td>Geographic Scope</td>
</tr>
<tr>
<td>1.2.1-A</td>
<td>Determine if any of the information required for this section is available from existing jurisdiction plans or documents, e.g., CEMP.</td>
</tr>
<tr>
<td>1.2.1-B</td>
<td>Identify the jurisdictions for which this evacuation plan is being written and to which it can be applied. Include maps as an appendix where appropriate.</td>
</tr>
<tr>
<td>1.2.1-C</td>
<td>Identify geographic areas of your region that may require particular attention (e.g., floodplains) during an evacuation. Include maps as an appendix where appropriate.</td>
</tr>
<tr>
<td>1.2.1-D</td>
<td>Identify jurisdiction(s) in the region beyond the legal scope of your region’s evacuation plan on which you might need to rely if an evacuation of your region occurs. Include maps as an appendix where appropriate. Examples include:</td>
</tr>
<tr>
<td></td>
<td>- Neighboring jurisdiction that may shelter your evacuees.</td>
</tr>
<tr>
<td></td>
<td>- Neighboring jurisdiction whose resources you may use.</td>
</tr>
<tr>
<td>1.2.1-E</td>
<td>Identify relevant geographic zones within your region. Areas may include but are not limited to:</td>
</tr>
<tr>
<td></td>
<td>- Residential areas</td>
</tr>
<tr>
<td></td>
<td>- Industrial areas</td>
</tr>
<tr>
<td></td>
<td>- Commercial areas (high daytime population)</td>
</tr>
<tr>
<td></td>
<td>- Arts or entertainment districts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1.2.2</th>
<th>Potential Evacuation Populations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2.2-A</td>
<td>Determine if any of the information required for this section is available from existing jurisdiction plans or documents, e.g., CEMP.</td>
</tr>
<tr>
<td>1.2.2-B</td>
<td>Determine the likely daytime populations for your region (by geographic zone). Daytime populations are likely to be higher in commercial areas where a major workforce is present.</td>
</tr>
<tr>
<td>1.2.2-C</td>
<td>Determine the likely nighttime populations for your region (by geographic zone). Nighttime populations are likely to be higher in residential areas.</td>
</tr>
<tr>
<td>1.2.2-D</td>
<td>Determine any seasonal populations for your region (by geographic zone), e.g., college/university students; migrant workers; tourists.</td>
</tr>
<tr>
<td>1.2.2-E</td>
<td>Determine the likely distribution of your region’s population (by geographic zone). Pay particular attention to areas with high concentrations of people, e.g., large employment centers or shopping malls</td>
</tr>
<tr>
<td>1.2.2-F</td>
<td>Determine the likely number of vehicles owned for each geographic zone within your region.</td>
</tr>
<tr>
<td></td>
<td>- Potential sources of information include planning department and U.S. census data.</td>
</tr>
<tr>
<td></td>
<td>- Use demographic data for vehicle ownership, commuting patterns, etc.</td>
</tr>
<tr>
<td>1.2.2-G</td>
<td>Determine the percentage of the population in your region that relies on public transportation on a daily basis to travel to/from the area (by geographic zone).</td>
</tr>
<tr>
<td>1.2.2-H</td>
<td>Determine the likely number of evacuees from your region that will require transportation assistance to evacuate (by geographic zone).</td>
</tr>
<tr>
<td></td>
<td>- Potential sources of information include planning department and U.S. census data.</td>
</tr>
<tr>
<td></td>
<td>- Use demographic data for vehicle ownership, commuting patterns, etc.</td>
</tr>
</tbody>
</table>
1.2.2-I  Determine the likely modes of transportation that will be available to evacuees (by geographic zone).
   - Consider the type of geographic zone and the accessibility of personal vehicles. Will evacuees attempt to drive, take public transportation, walk, etc.?

1.2.2-J  Determine the likely directions evacuees will try to travel (by geographic zone).
   - Understand possible evacuee destinations, (e.g., work locations, home, and location of children).

1.2.2-K  Identify the populations with access and functional needs (anyone requiring additional assistance to evacuate) for each geographic zone within your region.
   Populations with access and functional needs include but are not limited to:
   - People with restricted mobility (wheelchair/walking aid)
   - Patients/residents of hospitals, nursing homes, and assisted care facilities
   - People who are hearing-, language- or vision-impaired
   - Non-English speaking persons
   - Incarcerated persons
   - Commuter populations
   - People who are homeless
   - Students (e.g., colleges, schools, and childcare centers)
   - Animals (farm animals; kennels; veterinary hospitals; zoos; theme parks; pet stores; university laboratories)

1.2.2-L  Determine the likely distribution of the population with access and functional needs for each geographic zone within your region. Considerations include but are not limited to:
   - Where are hospitals located within your region?
   - Does your region have any prisons or courthouses where prisoners might be located during trial/sentencing?
   - Where are schools located within your region?
   - Does your region have any homeless shelters?

1.2.2-M  Determine the type of assistance required for individuals with access and functional needs, e.g., transportation, medical assistance, and specialized equipment.
   - Pay particular attention to areas with high concentrations of populations with access and functional needs.

1.2.2-N  Identify communities in your region that are located in known areas of high risk, e.g., within the emergency planning zone of a nuclear power plant, within a floodplain.
   - Refer to communities identified in item 4.2 of this tool, Likely Hazards of Note for Jurisdiction.

1.2.3  Parties Involved in Planning and Conducting an Evacuation

1.2.3-A  Determine which agencies within your region will be involved in evacuation planning and evacuation response. Examples include:
   - Executives (mayor/county executive/governor, etc.)
   - Emergency management/law enforcement/fire/EMS
   - Transportation/transit providers
   - Support Services
   - Resource Providers
| 1.2.3-B | Determine which neighboring jurisdiction(s) will be involved in evacuation planning and evacuation response.  
  ∙ Consider those jurisdictions identified under item 1.2.1, Geographic Scope. |
| 1.2.3-C | Determine outside organizations, private-sector companies, and points of contact that may support the evacuation response.  
  ∙ Consider those organizations and private-sector companies identified under item 7.0, Logistics.  
  ∙ Ensure points of contact are identified |
| 1.2.3-D | Determine the communication methods to be used to establish contact with the points of contact for each internal agency, neighboring jurisdiction, outside organization, and private-sector company that may have a role in either evacuation planning or evacuation response.  
  ∙ Identify secondary means of communication if the primary means fail to function.  
  ∙ Refer to item 5.4, Inter-Agency Communications Systems and Procedures. |
| 1.2.4 | Coordination with Other Plans and Guidance |
| 1.2.4-A | Ensure the evacuation plan is compatible with your participating jurisdictions’ (or region’s, if applicable) CEMPs. |
| 1.2.4-B | Ensure the evacuation plan is compatible with supporting plans from your participating jurisdictions. Examples include:  
  ∙ Continuity of Operations (COOP) plan  
  ∙ Continuity of Government (COG) plan |
| 1.2.4-C | Determine whether the evacuation plan will be a stand-alone plan, or whether it will be integrated into an existing emergency management plan, such as an annex to a CEMP. |
| 1.2.4-D | Determine any neighboring jurisdiction(s)’ plans with which your evacuation plan must be compatible (who are not among your participating jurisdictions).  
  ∙ Consider those jurisdictions identified under item 1.2.1, Geographic Scope.  
  ∙ Consider those plans identified under item 8.0, Plan Review and Maintenance. |
| 1.2.4-E | Determine any county or state plans with which your evacuation plan must be compatible.  
  ∙ Consider those jurisdictions identified under item 1.2.1, Geographic Scope.  
  ∙ Consider those plans identified under item 8.0, Plan Review and Maintenance. |
| 1.2.4-F | Determine any national guidelines with which your evacuation plan must be compatible. Examples include:  
  ∙ National Incident Management System (NIMS)  
  ∙ National Response Framework (NRF) |
| 1.2.5 | Limitations of Plan |
| 1.2.5-A | Provide plan users an explanation of the plans limitations. |
| 2.0 | Authorities |
| 2.0-A | Determine whether the elements of this section already exist in a previously written plan (e.g., a CEMP), and can simply be included in the evacuation plan by reference. |
| 2.1 | Introduction Explaining Inter-Relationships Among Levels of Government |
2.1-A Document the requirements and practices for the coordination of agencies/officials from the local, county, state, and federal levels of governments.
   - Refer to item 1.2.3, *Parties Involved in Planning and Conducting an Evacuation* and 1.2.4, *Coordination with Other Plans and Guidance*, for identified agencies.

2.1-B Reference the protocols for when agencies from each additional level of government get involved in an evacuation effort.

2.2 Federal Statutes/Regulations

2.2-A Include references to the federal statutes/regulations with which the evacuation plan must comply. Examples include:
   - Code of Federal Regulations
   - DHS/FEMA
   - Pets Evacuation and Transportation Standards Act of 2006

2.3 State Statutes/Regulations

2.3-A Include references to the state statutes/regulations to which the evacuation plan must adhere. Examples include:
   - Codes
   - Statutes
   - Public Laws

2.4 Local Statutes/Regulations

2.4-A Include references to the local statutes/regulations with which the evacuation plan must comply, particularly the enabling legislation with regard to declaring and conducting an evacuation. Examples include:
   - Proclamations of Authority
   - County Codes
   - County Plans
   - City/Town Codes

2.5 Plans and Agreements

2.5-A Include coordinated plans and agreements within your region and outside agencies. Examples include:
   - Local Mutual Aid
   - Inter Local Agreements
   - Inter-Governmental Agreement (IGA)

3.0 Critical Assumptions

3.1 Regulatory Issues

3.1-A Identify critical assumptions regarding regulatory issues that are relevant to conducting an evacuation, and may affect how evacuation operations occur.
   - Refer to item 2.2, *Federal Statutes/Regulations*.
   - Refer to item 2.3, *State Statutes/Regulations*.
   - Refer to item 2.4, *Local Statutes/Regulations*.

3.2 Local Parameters
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
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</thead>
</table>
| 3.2-A   | Identify critical assumptions regarding local parameters and conditions relevant to conducting an evacuation. Examples include:  
  - Emergency management practices unique to the region.  
  - Expectations regarding involvement of specific neighboring jurisdictions. |
| 3.3     | Local Limitations  
  3.3-A Identify critical assumptions regarding local limitations relevant to conducting an evacuation. Examples include:  
  - Region may have limited resources “in-house” to support evacuation and sheltering operations.  
  - Some citizens will not be willing to evacuate, regardless of the hazard. |
| 4.0     | Hazards  
  4.1  All-Hazards  
  4.1-A Ensure the evacuation plan is applicable across all types and scopes of hazards as listed in individual jurisdictions’ Hazard Identification and Vulnerability Assessment (HIVA).  
  4.1-B Ensure the evacuation plan addresses shelter-in-place tactics to be used when an evacuation is unsafe or not feasible.  
  4.1-C Ensure the evacuation plan addresses special hazards and unique scenarios specific to your region. Refer to the information gathered under item 4.2, Likely Hazards of Note for Region. |
| 4.2     | Likely Hazards of Note for Region  
  4.2-A Determine whether the elements of this section already exist in a previously written plan, e.g., a CEMP, and can simply be included in the evacuation plan by reference.  
  4.2-B Identify specific hazards that are likely to cause (or have previously caused) an evacuation in your region, e.g., hurricane, earthquake, nuclear power plant, etc.  
  - Consider unique geography and weather-related issues.  
  - Consider any facilities of special relevance.  
  4.2-C Determine and list regional scenario-specific plans that address evacuation measures for each identified hazard. For example:  
  - Dams  
  - Hazmat facilities  
  - Utility operators  
  4.2-D Identify the decision points/triggers (e.g., time-based, geography-based) for declaring an evacuation in response to each identified hazard.  
  - Identify the authority (by position) that has the legal power to declare an evacuation.  
  - Identify the agencies/personnel involved in monitoring evacuation triggers.  
  4.2-E Identify and prioritize communities in your region that will evacuate by virtue of their location in relation to the hazard source (for each identified hazard).  
  - Which communities will be negatively impacted first if the hazard occurs? |
<table>
<thead>
<tr>
<th>4.2-F</th>
<th>Determine the likely number of people and vehicles that will have to be evacuated from communities pre-identified as ones that are vulnerable to specific hazards (for each identified hazard).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Consider information gathered under item 1.2.2, Potential Evacuation Populations.</td>
</tr>
<tr>
<td>4.2-G</td>
<td>Determine the predicted direction and distance evacuees must travel from the known hazard source to ensure their safety.</td>
</tr>
<tr>
<td></td>
<td>- Identify the range of likely harmful effects based on the nature of the hazard.</td>
</tr>
<tr>
<td></td>
<td>- Determine weather aspects (e.g., wind speed and direction) that may influence the direction of the evacuation.</td>
</tr>
<tr>
<td>4.2-H</td>
<td>Estimate the time needed to complete the evacuation based on the projected evacuation characteristics for (each identified hazard).</td>
</tr>
<tr>
<td></td>
<td>- Inform shelter organizers of this timeframe.</td>
</tr>
<tr>
<td>4.2-I</td>
<td>Determine the likelihood of evacuating the entire affected population out of harm’s way before the hazard negatively impacts the area being evacuated (for each known hazard). If unlikely, shelter-in-place can be utilized if feasible.</td>
</tr>
<tr>
<td></td>
<td>- Identify the types of hazards that will likely require the use of shelter-in-place tactics. Examples include, but are not limited to, hazards that result in the following:</td>
</tr>
<tr>
<td></td>
<td>- Presence of toxic or radiological contaminants</td>
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<tr>
<td></td>
<td>- Compromised transportation infrastructure</td>
</tr>
<tr>
<td></td>
<td>- Designated evacuation routes being unusable</td>
</tr>
<tr>
<td></td>
<td>- Secondary fires and explosions</td>
</tr>
</tbody>
</table>

5.0 Concept of Operations

5.0-A Determine whether the elements of this section already exist in a previously written plan, e.g., a CEMP, and can simply be included in the evacuation plan by reference.

5.1 Acknowledgement of the State and Local Response Levels to Disasters and Incidents

5.1-A Establish procedures to identify an incident as rapidly as possible.

5.1-B Identify the administrative requirements to process proclamations and declarations of authority.

5.1-C Determine how your region intends to govern during the different stages of an evacuation (e.g., evacuation order given, while portions of the region are evacuating, during re-entry) if government facilities are damaged or otherwise non-functional.

5.1-D Determine contacts at the county and state EOCs that will facilitate support for an evacuation when needed.

5.1-E Determine the potential roles your region and your participating jurisdictions may hold during an evacuation.

- Evacuating jurisdiction
- Receiving jurisdiction
- "Pass-through" jurisdiction
- Supporting jurisdiction
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1-F</td>
<td>Determine the responsibilities of your region and your participating jurisdictions for each role they might hold during an evacuation.</td>
</tr>
<tr>
<td></td>
<td>- What parts of the plan will need to be activated if your region or participating jurisdiction is the evacuating jurisdiction? Receiving jurisdiction?</td>
</tr>
<tr>
<td>5.1-G</td>
<td>Determine how your region will move the resources and staff required to respond to an evacuation involving several jurisdictions.</td>
</tr>
<tr>
<td>5.2</td>
<td>Identification of Relevant Agencies</td>
</tr>
<tr>
<td>5.2-A</td>
<td>Establish procedures for when a participating jurisdiction or when and whether the regional CAME assumes the lead role in an evacuation.</td>
</tr>
<tr>
<td></td>
<td>- Determine if ICS structure will be used to coordinate the evacuation.</td>
</tr>
<tr>
<td></td>
<td>- Determine whether the Incident Commander will also coordinate the evacuation in addition to responding to the incident at the Incident Command Post (ICP).</td>
</tr>
<tr>
<td>5.2-B</td>
<td>Establish procedures for when your region supports the evacuation of another jurisdiction.</td>
</tr>
<tr>
<td></td>
<td>- Determine under what circumstances your evacuation plan will be implemented.</td>
</tr>
<tr>
<td></td>
<td>- Identify ways in which your region may support the lead jurisdiction.</td>
</tr>
<tr>
<td></td>
<td>- Identify who has the authority to commit resources to support an evacuation of another jurisdiction.</td>
</tr>
<tr>
<td>5.2-C</td>
<td>Determine the critical functions within your region that must remain operational during an evacuation? Examples include but are not limited to:</td>
</tr>
<tr>
<td></td>
<td>- Fire</td>
</tr>
<tr>
<td></td>
<td>- Police</td>
</tr>
<tr>
<td></td>
<td>- Hospitals</td>
</tr>
<tr>
<td>5.2-D</td>
<td>Establish procedures to ensure that staff needed to execute the evacuation plan is not forced to evacuate under mandatory evacuation orders.</td>
</tr>
<tr>
<td>5.2-E</td>
<td>Determine who is available for emergency services during the evacuation itself if police, fire, and rescue become heavily involved in incident activities.</td>
</tr>
<tr>
<td></td>
<td>- Determine how these individuals will be notified that their support is required.</td>
</tr>
<tr>
<td>5.3-A</td>
<td>Incident Command Structure/National Incident Management System (NIMS)</td>
</tr>
<tr>
<td></td>
<td>- Identify the types of initial command structure and next highest level of command structure that are viable options to use during an evacuation.</td>
</tr>
<tr>
<td></td>
<td>- Local, discrete site incident with an evacuation to be managed from the ICP (Single Command Incident Commander). <em>(Not applicable to the CAME/regional agreement).</em></td>
</tr>
<tr>
<td></td>
<td>- Local evacuation to stay within a single jurisdiction’s boundaries, but multiple agencies involved (Unified Command). <em>(Likely not applicable to the CAME/regional agreement).</em></td>
</tr>
<tr>
<td></td>
<td>- Local to small regional evacuation requiring resources from neighboring jurisdictions (Unified Area Command). <em>(The CAME/regional agreement would most likely be activated).</em></td>
</tr>
<tr>
<td></td>
<td>- County and state Incident Management Teams (IMTs). These are specific types of Area Commands that have been identified as resources that may be available for larger evacuation efforts. <em>(The CAME/regional agreement would definitely be activated).</em></td>
</tr>
<tr>
<td></td>
<td>- State and federal IMTs and Emergency Response Teams (ERTs). <em>(The CAME/regional agreement would definitely be activated).</em></td>
</tr>
</tbody>
</table>
| 5.3-B | Establish procedures to be used to make an initial assessment and decision on the command structure required to successfully manage an evacuation. Considerations include but are not limited to:  
- Clear hierarchy and schematic representation of organization structure  
- Unified Command versus Area Commands  
- County and state IMTs  
- Smooth transfer of authority/expanding the response for the incident  
- Whether police or fire officials will make the initial call for the evacuation  
- Involvement of community officials |
| 5.3-C | Identify possible locations for Incident Command Posts (ICP), Unified and Area Commands, supporting facilities (e.g., operational control centers), and emergency operations centers (EOC).  
- Ensure that the facilities are able to address any special requirements.  
- Ensure the locations are linked with other facilities that may be used during an evacuation. |
| 5.3-D | Determine from which location(s) the region intends to monitor and run an evacuation.  
- Ensure that the facility is able to address any special requirements.  
- Ensure this location is linked with other facilities to be used during an evacuation. |
| 5.3-E | Ensure that all identified facilities (e.g., buildings, offices, operations centers) have the capacity to support the needs of an Incident Commander on short notice. |
| 5.3-F | Establish procedures to electronically link all facilities that may be utilized during an evacuation.  
- Consider facilities of neighboring jurisdictions.  
- Consider facilities at the county and state level.  
- Consider transportation management centers and operational control centers. |
| 5.3-G | Determine what efforts are required to set up/activate the ICP and Unified/Area Commands (UC/AC), when applicable.  
- Identify the responsible party for set up/activation.  
- Establish procedures to convey information to the responsible party that set up/activation is required.  
- Identify the resources required for set up/activation. |
| 5.3-H | Determine the methods that will be used to establish communication methods with state and local EOCs in support of evacuation operations (e.g., ICP, shelter locations, media outlets, etc.).  
- Refer to item 5.4, Inter-Agency Communications Systems and Procedures. |
| 5.3-I | Establish procedures to ensure the Public Information Officer (PIO) is supported in the distribution of command structure information. |

### 5.4 Inter-Agency Communications Systems and Procedures

| 5.4-A | Determine the agencies and jurisdictions that will be notified when an incident occurs and an evacuation is likely or imminent.  
- Refer to Item 1.2.3, Parties Involved in Planning and Conducting an Evacuation for agencies/jurisdictions pre-identified.  
- Assemble contact information and call sheets for relevant jurisdictions/agencies.  
- Establish a review process for regularly verifying/updating contact information and call sheets. |
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>5.4-B</td>
<td>Determine how notifications will occur. Refer to jurisdiction and regional protocols that outline communication methods with outside jurisdictions/ agencies. If necessary:</td>
</tr>
<tr>
<td></td>
<td>- Document the communication methods used by each agency/jurisdiction.</td>
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<tr>
<td></td>
<td>- Evaluate these communication methods to ensure compatibility among multiple agencies/jurisdictions and regions.</td>
</tr>
<tr>
<td></td>
<td>- Identify the gaps or conflicts that need to be addressed as part of the overall emergency management planning effort.</td>
</tr>
<tr>
<td>5.4-C</td>
<td>Ensure that your region has sufficient wireless communications to meet every day internal requirements before becoming interoperable.</td>
</tr>
<tr>
<td>5.4-D</td>
<td>Ensure there is a means to communicate (voice/data) between relevant agencies/jurisdictions.</td>
</tr>
<tr>
<td></td>
<td>- Identify a communications system for the efficient flow of information during an emergency or disaster.</td>
</tr>
<tr>
<td></td>
<td>- Identify the location and availability of sources of communications (public or private).</td>
</tr>
<tr>
<td></td>
<td>- Develop clear communications protocols.</td>
</tr>
<tr>
<td>5.4-E</td>
<td>Identify communication and data standards.</td>
</tr>
<tr>
<td>5.4-F</td>
<td>Determine whether necessary MOUs and Sharing Agreements for operating the public safety interoperability channels exist.</td>
</tr>
<tr>
<td>5.4-G</td>
<td>Ensure redundant communication methods are in place for communicating with other agencies/jurisdictions, as normal communication capacities may become overwhelmed/unusable during large-scale disasters.</td>
</tr>
<tr>
<td></td>
<td>- Identify secondary communication systems.</td>
</tr>
<tr>
<td>5.5</td>
<td>Public Communications</td>
</tr>
<tr>
<td>5.5-A</td>
<td>Determine the best way to structure a public education campaign to inform citizens of the steps they can take to prepare for possible emergency situations and how to better prepare themselves if an evacuation occurs. Examples include:</td>
</tr>
<tr>
<td></td>
<td>- Brochures</td>
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<td></td>
<td>- Public awareness classes</td>
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<tr>
<td></td>
<td>- Community outreach</td>
</tr>
<tr>
<td></td>
<td>- 211 Communications</td>
</tr>
<tr>
<td></td>
<td>- Reverse 911</td>
</tr>
<tr>
<td></td>
<td>- 10-watt radio stations</td>
</tr>
<tr>
<td>5.5-B</td>
<td>Determine what information will be provided to the public to promote general evacuation preparedness, as part of a public education effort (e.g., strategies for personal preparation, recommended supplies, sources of additional information, etc.).</td>
</tr>
<tr>
<td>5.5-C</td>
<td>Establish procedures for notifying citizens that live/work in evacuation zones of identified hazards of relevant information to those hazards. Consider the hazards identified in item 4.2, Likely Hazards of Note for Region. Examples include:</td>
</tr>
<tr>
<td></td>
<td>- Any signs/precursors of the hazards</td>
</tr>
<tr>
<td></td>
<td>- Evacuation procedures and likely routes</td>
</tr>
<tr>
<td></td>
<td>- Location of nearby shelters</td>
</tr>
</tbody>
</table>
5.5-D | Determine what communication methods may be used to notify the public about an incident. Examples include:

- Television - with closed caption scrolling and American Sign Language interpreter on camera for major announcements
- Radio
- Emergency Broadcast System
- Automated systems (e.g., reverse 911, variable message signs (VMS), dynamic message signs). Work with the deaf and hard of hearing community to ensure that automated systems such as reverse 911 will trigger their personal alert systems.
- Highway Advisory Radio (HAR)
- Web site
- Door-to-door notification
- Local media
- Social media – Facebook, Twitter, others
- Internet alerts – Google, others
- Text alerts
- Sirens, bullhorns on police or emergency service vehicles

5.5-E | Determine the initial information that will be communicated to the public once an incident has occurred and an evacuation is imminent or necessary. Examples include:

- Whether citizens evacuate or shelter-in-place
- Areas that require evacuation
- Transportation options
- How pets will be accommodated
- How/when informational updates will be made

5.5-F | Include provisions in the evacuation plan for communicating with populations with access and functional needs when traditional modes of communication are insufficient.

- Consider item 1.2.2, Potential Evacuation Populations for categories of populations with access and functional needs who may require alternate modes of communication.
- Determine the most effective methods for each population group; e.g., engage or develop a local community group emergency communications network (per TCRP Report 150: Communications with Vulnerable Populations- A Transportation and Emergency Management Toolkit), especially to reach foreign language groups, deaf and hard of hearing, blind or limited vision, deaf/blind, people with cognitive disorders, others with access and functional needs that limit communications.

5.5-G | Determine the contingency plans to be used if the primary means of public communication are unavailable.

- Ensure that all relevant agencies are informed of these measures.

5.5-H | Prepare sample/pre-scripted messages that may be used when communicating to the public via automated systems such as variable message signs and reverse 911.
Establish procedures for providing real-time updates to citizens during an evacuation. Information to consider includes:

- Incident status
- Updated evacuation routes
- Road closures
- Traffic conditions
- Shelter locations and capacities
- Weather conditions

### 6.1 Incident Analysis

#### 6.1.1 Command and Control

**6.1.1-A** Refer to your participating jurisdictions’ emergency response procedures for protocols on initial identification and response to an incident.

**6.1.1-B** Determine how key officials will be alerted of the possible need to evacuate.

- Refer to item 5.4, *Inter-Agency Communications Systems and Procedures*.
- Identify the agencies and staff positions responsible for providing information to key officials.

**6.1.1-C** Determine who within your jurisdiction and region has the legal authority to declare an evacuation.

- Ensure the person with authority is aware of the steps that must be taken.

**6.1.1-D** Establish criteria to use in determining whether to issue a voluntary, recommended, or mandatory evacuation order.

- Determine if the legal authority exists to mandate an evacuation.

**6.1.1-E** Identify agencies and lead staff that will be involved in declaring an evacuation.

- Ensure all of these agencies are identified in the evacuation plan under item 1.2.3, *Parties Involved in Planning and Conducting an Evacuation*.
- Clearly define and delineate the roles for each position and agency within the evacuation plan.

**6.1.1-F** Create pre-approved drafts of executive orders for evacuations.

- Determine what language/provisions these will contain.

**6.1.1-G** Identify which agency will manage the evacuation’s overall operations.

- Determine if this will vary, depending on the location or scope of the evacuation.
- Refer to item 5.2, *Identification of Relevant Agencies*.

**6.1.1-H** Identify which agencies will have staff members report to the EOC in the event of an evacuation.

- Create notification procedures for this to occur.
- Establish procedures to collect and update on a regular basis the necessary contact information to be used during a notification.

**6.1.1-I** Establish notification procedures to be used when a command structure is chosen and activated.

- Refer to item 5.3, *Incident Command Structure/National Incident Management System* for information on specific considerations for selecting an appropriate command structure.

**6.1.1-J** Establish timetables to reevaluate the need for additional resources.
6.1.1-K  Establish timetables to reevaluate the need for an increase/decrease in the scope of the command structure.

6.1.1-L  Create procedures to establish an emergency response command structure in a timely fashion. These must be clearly stated in the evacuation plan.

6.1.1-M  Address the inclusion of neighboring jurisdictions (who are not already participating jurisdictions) into the command structure, with regard to these jurisdictions providing sheltering and support services.

6.1.1-N  Identify the roles and responsibilities of different levels of government.
- Identify how emergency responders, emergency management, and local government will communicate and share authority during an evacuation.
- Determine how these government agencies will coordinate their efforts with each other. See item 5.1, Acknowledgement of the State and Local Response Levels to Disasters and Incidents.

6.1.2  Planning

6.1.2-A  Identify the types of information to be collected, including but not limited to:
- Location
- Nature of the hazard(s)
- Projected area that will be affected.
- Projected size of population to be involved in the evacuation

6.1.2-B  Determine the factors involved in identifying the size of the area to be evacuated and how many people will be affected.
- Refer to item 4.2, Likely Hazards of Note for Region.
- Refer to item 1.2, Scope for Information on Evacuation Populations and Geographic Data.

6.1.2-C  Identify the decision points/triggers (e.g., time-based, geography-based) for declaring an evacuation.
- Identify the agencies/personnel involved in monitoring evacuation triggers.
- Document the decision criteria to be monitored and evaluated before determining whether to issue an evacuation order or to request that citizens shelter-in-place.
- Outline how these criteria may vary for different scenarios.
- Refer to item 4.2, Likely Hazards of Note for Region for decision points/triggers for identified hazards.

6.1.2-D  Determine how information about the incident will be transmitted from responders in the field to decision makers.

6.1.3  Operations

6.1.3-A  Determine what field activities may be used to collect information about the incident and any associated characteristics that may be relevant to an evacuation decision (e.g., nature of threat, condition of transportation infrastructure, etc.).

6.1.3-B  Determine what activities can be taken to use data systems to collect information about the incident.

6.1.4  Logistics

6.1.4-A  Determine staffing levels that currently exist for your region.
- Consider traditional work hours and off-hours (e.g., weekend/nighttime).
- Establish procedures for regularly updating staffing level amounts.
- Assess whether traditional staffing levels will be sufficient to respond to an evacuation.
6.1.4-B  Identify the types of resources needed to conduct an evacuation.
  - Refer to item 7.1, Resource Management for specific information on resource acquisition and identification.
  - Identify organizations and individuals (by position) responsible for directing the staff and resources needed to execute an evacuation order.
  - Consider staff, assets, and supplies.

6.1.5  Finance

6.1.5-A  Determine whether your participating jurisdictions already have expense-tracking mechanisms in place.
  - If so, follow expense-tracking mechanisms currently in place by your participating jurisdictions.
  - If not, establish procedures to create expense-tracking mechanisms to be used by your region during an evacuation.
  - Consider how expenditures need to be documented in order to receive reimbursement.

6.2  Warning

6.2.1  Command and Control

6.2.1-A  Determine how evacuation orders can be amended or revised as a situation develops.
  - Identify who will have the authority to do so.
  - Reference ESF 2

6.2.1-B  Establish procedures that allow for regularly scheduled evaluations of response tactics and levels once an incident occurs.
  - Follow procedures established under item 5.4, Inter-Agency Communications Systems and Procedures to notify relevant agencies/jurisdictions of any changes.
  - Establish procedures so that decision makers receive regular briefings about incident status and characteristics.

6.2.2  Planning

6.2.2-A  Determine the factors involved with identifying the size of an area to be evacuated and how many people will be affected.
  - Refer to item 4.2, Likely Hazards of Note for Region.
  - Refer to item 1.2.2, Potential Evacuation Populations.

6.2.2-B  Determine the agencies/jurisdictions/organizations that need to be informed if an evacuation order is issued. Considerations include:
  - Agencies/jurisdictions/organizations from which you will require assistance
  - Agencies/jurisdictions/organizations with which you have mutual aid agreements/contracts
  - Agencies/jurisdictions/organizations that operate shelters
  - Agencies/jurisdictions/organizations that can assist with evacuating populations with access and functional needs

6.2.2-C  Determine the types of warning messages that may be used to inform the public of an incident and possible evacuation.
  - Identify the information that will be included as part of the warning message.
<table>
<thead>
<tr>
<th>6.2.2-D</th>
<th>Determine how far in advance of an evacuation order warning messages must be released.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>· Create pre-scripted messages for use during a no-notice incident.</td>
</tr>
<tr>
<td></td>
<td>· Establish verification procedures for warning messages.</td>
</tr>
<tr>
<td>6.2.2-E</td>
<td>Determine the modes of communication that can be used to inform the public of an evacuation order.</td>
</tr>
<tr>
<td></td>
<td>· Refer to item 5.5, <em>Public Communications</em>.</td>
</tr>
<tr>
<td>6.2.3</td>
<td>Operations</td>
</tr>
<tr>
<td>6.2.3-A</td>
<td>Determine which officer/agency will broadcast the evacuation notifications to the public using the selected methods.</td>
</tr>
<tr>
<td></td>
<td>· Address provisions for population groups with special communications-related needs (e.g., sight- or hearing-impaired, non-English speaking, groups without access to common media).</td>
</tr>
<tr>
<td></td>
<td>· Refer to item 5.5, <em>Public Communications</em>.</td>
</tr>
<tr>
<td>6.2.4</td>
<td>Logistics</td>
</tr>
<tr>
<td>6.2.4-A</td>
<td>Determine communications systems (reverse 911, HAR, etc.) that can be used to broadcast the evacuation notice.</td>
</tr>
<tr>
<td>6.2.4-B</td>
<td>Determine media companies (television, radio) that can be used to broadcast the evacuation notice.</td>
</tr>
</tbody>
</table>

### 6.3 Preparation to Move

#### 6.3.1 Command and Control

**6.3.1-A** Determine how evacuation orders can be amended or revised as a situation develops.
- Identify who will have the authority to do so.
- Follow procedures established under item 5.4, *Inter-Agency Communications Systems and Procedures* to notify relevant agencies/jurisdictions of any changes.

**6.3.1-B** Establish procedures that allow for regularly scheduled evaluations of response tactics and levels once an incident occurs.
- Follow procedures established under item 5.4, *Inter-Agency Communications Systems and Procedures* to notify relevant agencies/jurisdictions of any changes.
- Establish procedures so that decision makers receive regular briefings about incident status and characteristics.

#### 6.3.2 Planning

**6.3.2-A** Establish procedures to review incident-specific information that will allow for a determination of the geographic areas and populations to be evacuated.
- Consider information gathered under item 6.2.2, *Planning*.

**6.3.2-B** Identify the provisions needed to close schools and businesses in the at-risk area.
- Determine how these decisions will be announced.
### 6.3.2-C
Establish procedures for conducting assessments of transportation infrastructure in the immediate aftermath of an incident. Determine which safety considerations are relevant to potential evacuation routes.

- Is the infrastructure safe for immediate use?
- If infrastructure is deemed unsafe, are there any short-term solutions that can be put in place in order to still utilize infrastructure?
- In instances where transportation infrastructure is unusable, how will this information be communicated to the public?

### 6.3.2-D
Establish procedures for testing communication methods in the immediate aftermath of an incident.

- Determine which means of communication are still available to your region.
- Determine the agency responsible for bringing downed communication infrastructure back on-line.
- Establish procedures to ensure that all involved jurisdictions/agencies are given real-time updates as to which communication methods may be used. Refer to Item 5.4, *Inter-Agency Communications Systems and Procedures*.

### 6.3.2-E
Identify primary and secondary rally points to be used by your region in the event of an evacuation. Points to consider include:

- Capacity to hold large amounts of people
- Ability for modes of transportation (e.g., buses) to maneuver
- Ability for multiple modes to intersect and transfer (if applicable for your region, e.g., bus to rail)
- Provides temporary shelter from the elements

### 6.3.2-F
Determine whether your participating jurisdictions must enter into a contract with the owners/operators of rally points in order to use them during an evacuation.

### 6.3.2-G
Identify locations within your region that are suitable shelters. Considerations include but are not limited to:

- Capacity of shelter
- Type of shelter (e.g., temporary emergency: hours; short-term: days; long-term: weeks)
- Animal-friendly (e.g., service animals/pets)
- Ability to shelter populations with access and functional needs- including those requiring medical attention
- Proximity to evacuation routes
- Location of shelter (e.g., outside floodplain/known area of risk from identified hazards) (Refer to Item 4.2, *Likely Hazards of Note for Region*).

### 6.3.2-H
Determine the facilities provided by shelters capable of housing populations with access and functional needs. These will be general population shelters, but may need to have generators for those who need to recharge durable medical equipment, may need raised cots, and may need additional space per person to accommodate service animals and durable medical equipment. May need quiet areas for people with cognitive disabilities as well as safe areas for children to play.

- Determine the total capacity of these shelters in comparison to the anticipated population sizes.

### 6.3.2-I
Determine the total capacity of shelters willing to accept service animals and pets in comparison to the anticipated animal population.

### 6.3.2-J
Determine whether your participating jurisdictions (or the regional entity) must enter into a contract with the owners/operators of shelter locations in order to use them during an evacuation.

### 6.3.2-K
Identify outside organizations (e.g., American Red Cross) that may be able to assist with and/or operate shelters.
<table>
<thead>
<tr>
<th>6.3.2-L</th>
<th>Identify locations outside your region that are suitable shelters.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Reach out to neighboring jurisdictions.</td>
</tr>
<tr>
<td></td>
<td>- Establish, where appropriate, mutual aid agreements/contracts for the use of those sites.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.3.2-M</th>
<th>Identify locations that may be suitable non-public shelters (e.g., hotels).</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>- Establish procedures for conducting outreach to non-public shelters.</td>
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<td></td>
<td>- Determine how the availability of these sites will be communicated to the public. Refer to item 5.5, Public Communications for how best to communicate this information to the public.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.3.2-N</th>
<th>Identify private facilities (e.g., hotels, universities, convention centers, etc.) able to provide sufficient space to house the worst-case estimate for the number of evacuees requiring shelter.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Establish, where appropriate, mutual aid agreements/contracts for the use of those sites.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>6.3.2-O</th>
<th>Identify locations both within and outside your region that are suitable drop-off points.</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>- Establish, where appropriate, mutual aid agreements/contracts for the use of those sites.</td>
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</table>

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<thead>
<tr>
<th>6.3.2-P</th>
<th>Determine whether your participating jurisdictions or the regional entity must enter into a contract with the owners/operators of drop-off point locations in order to use them during an evacuation effort.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6.3.3 Operations</td>
</tr>
<tr>
<td>6.3.3-A</td>
<td>Determine the types of transportation modes that can be used in your region during an evacuation. Examples include:</td>
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<tr>
<td></td>
<td>- Pedestrian-only (where do evacuees walk, e.g., outside designated hot zone, rally points to region transportation; designated pedestrian routes)</td>
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<td>- Vehicular (use of personal vehicles and/or transit vehicles)</td>
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<tr>
<td></td>
<td>- Public transit vehicles - bus, light rail, heavy rail (subway), commuter trains, people movers, other</td>
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<td>- School buses</td>
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<td>- Paratransit vehicles</td>
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<td></td>
<td>- Ambulances</td>
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<td>- School buses converted to transport people in wheelchairs or on stretchers</td>
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<td></td>
<td>- Taxis</td>
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<td></td>
<td>- Non-government agency vehicles (e.g., church buses and volunteer group vehicles)</td>
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<td>- Over-the-road coaches, charter buses</td>
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<td>- Trains (e.g., Amtrak or regional train services)</td>
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<td>- Ferries and other boats</td>
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<td>- Planes (commercial and private), helicopters</td>
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<td>- Multi-modal</td>
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<td>- Evacuees needing transportation assistance walk to, take public transit, or are transported to a rally point (intermodal center or other designated location)</td>
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<td>- Evacuees are registered prior to transport</td>
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<tr>
<td></td>
<td>- Evacuees are transported (with family members, care givers, service animals, support equipment such as scooters, pets, and belongings, as applicable to the individual and according to published guidelines) to destination shelters via one or more modes</td>
</tr>
</tbody>
</table>
| 6.3.3-B | Include provisions for selecting evacuation routes.  
|         | - Determine the criteria that will be used to select the routes.  
|         | - Identify the potential vulnerabilities and choke points on the evacuation routes.  
|         | - Establish procedures for including evacuation routes as part of the evacuation plan. |
| 6.3.3-C | Determine the best way to designate and mark evacuation routes.  
|         | - Refer to item 5.5, *Public Communications* for how best to communicate this information to the public. |
| 6.3.3-D | Identify potential traffic management tactics to be used to increase capacity and travel speed on designated evacuation routes. Examples include, but are not limited to:  
|         | - Closing parking garages (to prevent the use of personal vehicles)  
|         | - Adjustments to traffic signal timing  
|         | - Adjustments to lane usage (e.g., where inbound and outbound lane markings vary by time of day with arrows and Xs)  
|         | - Making selected arterial or collector streets one-way (can be practiced with planned special events)  
|         | - Emergency restrictions on parking along evacuation routes with towing of vehicles to clear routes  
|         | - Clearing road construction/maintenance sites where feasible (depending on construction/maintenance status)  
|         | - Diverting some traffic to an alternate parallel route prior to a lane drop  
|         | - Law enforcement personnel performing traffic control at key intersections  
|         | - Closing specific on-ramps and/or off-ramps |
| 6.3.3-E | Consider contraflow as a traffic management tactic in situations where time allows.  
|         | - Determine if it is a viable option for one or more routes given the configuration and resource requirements.  
|         | - Consider whether reserving one or more contraflow lanes for buses, other high-occupancy vehicles including paratransit vehicles and ambulances (all with trained operators) could improve operations.  
|         | - Establish procedures that require agencies to test and practice implementing contraflow techniques.  
|         | - Determine how the public will be informed of contraflow plans (e.g., start and end times). Refer to item 5.5, *Public Communications* for how best to communicate this information to the public.  
|         | - Establish procedures to communicate and coordinate contraflow operations with neighboring jurisdictions. |
| 6.3.3-F | Identify critical intersections and other points along evacuation routes likely to be potential bottleneck sources. Examples include:  
|         | - Railroad crossings.  
|         | - Bridges  
|         | - Major intersections  
|         | - On/off ramps  
|         | - Lane drops (e.g., where a roadway drops from 4 lanes to 3 lanes, etc.) |
| 6.3.3-G | Establish procedures to monitor/staff bottleneck areas, where appropriate. |
| 6.3.3-H | Identify the tools that will be used (e.g., traffic control devices, including ITS) to support traffic management efforts. |
| 6.3.3-I | Identify the resources needed to support evacuation routes. These resources will be listed in the evacuation plan.  
<p>|         | - Determine what associated information (e.g., controlling agency, geographic location, etc.) will be included. |</p>
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<tr>
<td>6.3.3-J</td>
<td>Determine how transportation resources will be obtained, managed, and coordinated.</td>
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<tr>
<td>6.3.3-K</td>
<td>Determine if standby contracts exist (e.g., motor coach companies, paratransit providers, ambulance companies, railroads, air carriers, etc.) to obtain operators and equipment to address identified transportation shortfalls.</td>
</tr>
<tr>
<td>6.3.3-L</td>
<td>Identify the decision points/triggers for activating rally points.</td>
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<tr>
<td>6.3.3-M</td>
<td>Identify the decision points/triggers for activating shelters.</td>
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<tr>
<td>6.3.3-N</td>
<td>Determine whether travel routes to shelters will be marked. Questions to consider include:</td>
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<tr>
<td>6.3.3-O</td>
<td>Identify the decision points/triggers for activating drop-off points.</td>
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<tr>
<td>6.3.3-P</td>
<td>Establish procedures for activating the communications systems for first responders and field personnel.</td>
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<tr>
<td>6.3.3-Q</td>
<td>Establish procedures for assisting populations with access and functional needs to evacuate.</td>
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<tr>
<td>6.3.3-R</td>
<td>Include provisions for movement of required assist devices such as wheelchairs, scooters, life support systems, service animals, and communication equipment.</td>
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</tbody>
</table>
**6.3.3-S** Determine the method(s) of communication that can be used to broadcast route and destination information to the general public.
- Refer to item 5.5, *Public Communications*.

**6.3.3-T** Determine what type of information will be broadcast to the public about evacuation routes and destinations. Examples include:
- Viable evacuation routes
- Location of shelters, rally points, and drop-off points
- Shelter capacities
- Available services (e.g., food, fuel, rest stations) along destination routes
- Traffic reports

**6.3.3-U** Determine whether protective action choices may be available and appropriate to manage travel demand, ease traffic congestion, and improve public safety.
- Phased evacuation (e.g., staggered release of employees; or staged clearance of neighborhoods and areas, beginning with those most in danger; or early evacuation of facilities such as nursing homes).
- Limited evacuation.
- Shelter-in-place

**6.3.4 Logistics**

**6.3.4-A** Establish procedures for tracking resources during the entire duration of an evacuation operation.
- Track resources from when they are mobilized until they are demobilized and returned to the controlling agency.
- Use ICS protocols set forth in *ICS 300: Intermediate ICS for Expanding Incidents, Unit 6*, to track resources during actual evacuation operations.

**6.3.4-B** Establish procedures for determining when traffic management staff and assets will be deployed.
- Determine how these decisions may be broadcast to relevant jurisdictions and agencies.

**6.3.4-C** Establish procedures for determining when shelter staff and assets will be deployed.
- Determine how these decisions may be broadcast to relevant jurisdictions and agencies.

**6.3.5 Finance**

**6.3.5-A** Confirm whether your participating jurisdictions already have expense tracking mechanisms in place.
- If so, follow expense-tracking mechanisms currently in place by your participating jurisdictions.
- If not, follow the procedures for expense tracking mechanisms established in item 6.1.5-A.
- Consider how expenditures need to be documented in order to receive reimbursement.

**6.4 Movement and En-Route Support**

**6.4.1 Command and Control**

**6.4.1-A** Determine how evacuation orders can be amended or revised as a situation develops.
- Identify who will have the authority to do so.
- Follow procedures established under item 5.4, *Inter-Agency Communications Systems and Procedures* to notify relevant agencies/jurisdictions of any changes.
<table>
<thead>
<tr>
<th>6.4.1-B</th>
<th>Establish procedures that allow for regularly scheduled evaluations of response tactics and levels once an incident occurs.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Follow procedures established under Item 5.4, <em>Inter-Agency Communications Systems and Procedures</em> to notify relevant agencies/jurisdictions of any changes.</td>
</tr>
<tr>
<td></td>
<td>• Establish procedures so that decision makers receive regular briefings about incident status and characteristics.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.4.2</th>
<th>Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.4.2-A</td>
<td>Determine how obstacles (e.g., traffic accidents, infrastructure damage, and debris) on the designated evacuation routes will be identified and resolved during the evacuation movement.</td>
</tr>
<tr>
<td></td>
<td>• Identify the agencies that will be responsible for monitoring the routes.</td>
</tr>
<tr>
<td></td>
<td>• Identify existing and planned monitoring systems that can be used.</td>
</tr>
<tr>
<td></td>
<td>• Identify the agencies and equipment that will be used to clear any obstacles.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.4.3</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.4.3-A</td>
<td>Identify who has the legal authority to authorize measures that will facilitate traffic movement (e.g., the suspension of toll collections, locking down drawbridges).</td>
</tr>
<tr>
<td></td>
<td>• Create procedures for how these individuals will be notified if such measures need to be instituted.</td>
</tr>
<tr>
<td></td>
<td>• Establish procedures for communicating these measures to field personnel.</td>
</tr>
<tr>
<td>6.4.3-B</td>
<td>Determine how operational adjustments may be used to maximize throughput on the evacuation routes.</td>
</tr>
<tr>
<td></td>
<td>• See item 6.3.3 for information about traffic management tactics.</td>
</tr>
<tr>
<td>6.4.3-C</td>
<td>Determine how evacuation operations of motorized transport, rail, air, water, and other modes of transportation may be monitored to determine the adequacy of available resources.</td>
</tr>
<tr>
<td></td>
<td>• Identify the agency responsible for monitoring resource requirements and availability.</td>
</tr>
<tr>
<td>6.4.3-D</td>
<td>Determine what technology systems and protocols are available to monitor traffic conditions on the selected evacuation routes.</td>
</tr>
<tr>
<td></td>
<td>• Determine the best way to share this information with relevant agencies.</td>
</tr>
<tr>
<td>6.4.3-E</td>
<td>Identify inbound/outbound routes that may be dedicated for emergency response vehicles.</td>
</tr>
<tr>
<td></td>
<td>• Determine how the dedicated routes will be marked/staffed so citizens will be aware that these routes are not available for use during an evacuation.</td>
</tr>
<tr>
<td></td>
<td>• Consider the resources required to mark/staff emergency response routes. Refer to item 7.1, <em>Resource Management</em> for information on requesting resources.</td>
</tr>
<tr>
<td>6.4.3-F</td>
<td>Identify routes that may be dedicated for pedestrians only.</td>
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<td></td>
<td>· Determine how pedestrian-only routes will be marked/staffed so citizens will be aware that these routes are for use during an evacuation.</td>
</tr>
<tr>
<td></td>
<td>· Determine how pedestrian-only routes will be marked/staffed so citizens relying on vehicular modes of transportation will be aware that these routes are not for use during an evacuation.</td>
</tr>
<tr>
<td></td>
<td>· Consider the resources required to mark/staff pedestrian-only routes. Refer to item 7.1, Resource Management for information on requesting resources.</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>6.4.3-G</th>
<th>Determine which agency is responsible for sweeping the affected area(s) being evacuated.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>· Establish procedures that dictate the type of information that will be shared with evacuees during an area sweep.</td>
</tr>
<tr>
<td></td>
<td>· Establish procedures for personnel sweeping the area to follow if it is determined an evacuee needs special assistance to evacuate.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.4.3-H</th>
<th>Review procedures established under item 5.5, Public Communications for the best ways to broadcast ongoing information/updates to evacuees and the public. Information will include:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>· Incident status</td>
</tr>
<tr>
<td></td>
<td>· Updated evacuation routes</td>
</tr>
<tr>
<td></td>
<td>· Road closures</td>
</tr>
<tr>
<td></td>
<td>· Traffic conditions</td>
</tr>
<tr>
<td></td>
<td>· Shelter locations and capacities</td>
</tr>
<tr>
<td></td>
<td>· Weather conditions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.4.3-I</th>
<th>Determine the possible areas within your region that may require a law enforcement presence to help establish and maintain order during evacuation operations. Examples include:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>· Along evacuation routes.</td>
</tr>
<tr>
<td></td>
<td>· Major intersections.</td>
</tr>
<tr>
<td></td>
<td>· Within evacuated area</td>
</tr>
<tr>
<td></td>
<td>· Rally points</td>
</tr>
<tr>
<td></td>
<td>· On public transportation being used to transport evacuees</td>
</tr>
<tr>
<td></td>
<td>· Shelters</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.4.3-J</th>
<th>Establish procedures to determine appropriate staffing levels required for the full activation of rally points.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>· Refer to item 6.3.2, Planning for information on rally point identification.</td>
</tr>
<tr>
<td></td>
<td>· Reach out to appropriate jurisdictions/agencies if staffing levels may exceed internal capabilities. Refer to item 7.2, Supportive Agreements.</td>
</tr>
<tr>
<td></td>
<td>· Establish procedures to provide personnel located at rally points up-to-date evacuation information in order to ensure their effective communication with the evacuees at the rally points.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.4.3-K</th>
<th>Incorporate current Hazmat procedures into the evacuation plan for response to incidents involving hazardous materials.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>· Verify the appropriate levels of personal protective equipment (PPE) required.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.4.3-L</th>
<th>Determine the legal authority your participating jurisdictions have, if any, to forcibly quarantine citizens.</th>
</tr>
</thead>
</table>

<p>| 6.4.3-M | Establish procedures for activating/setting up a quarantined location for populations exposed to the hazard, within the legal scope of your participating jurisdictions. |</p>
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.4.3-N</td>
<td>Incorporate current decontamination procedures into the evacuation plan for response to incidents involving hazardous materials.</td>
</tr>
<tr>
<td></td>
<td>· Identify the location(s) of decontamination equipment.</td>
</tr>
<tr>
<td></td>
<td>· Identify the number of law enforcement personnel required to provide control of hot zones.</td>
</tr>
<tr>
<td>6.4.3-O</td>
<td>Determine how information will be communicated to citizens about the nature of the Hazmat incident, specifically to those individuals requiring decontamination.</td>
</tr>
<tr>
<td></td>
<td>· Consider the increased levels of fear and uncertainty on behalf of the public due to the often negative and terrifying connotation of certain contaminants.</td>
</tr>
<tr>
<td>6.4.4</td>
<td>Logistics</td>
</tr>
<tr>
<td>6.4.4-A</td>
<td>Establish procedures for how transportation agencies will identify the numbers and locations of available vehicles if transportation must be provided to the public.</td>
</tr>
<tr>
<td></td>
<td>· Factor this information into deployment decisions for those vehicles.</td>
</tr>
<tr>
<td>6.4.4-B</td>
<td>Document any mutual aid agreements or contracts with the private sector for the use of transportation vehicles. Examples include:</td>
</tr>
<tr>
<td></td>
<td>· Public transit vehicles - bus, light rail, heavy rail (subway), commuter trains, people movers, other</td>
</tr>
<tr>
<td></td>
<td>· School buses</td>
</tr>
<tr>
<td></td>
<td>· Paratransit vehicles</td>
</tr>
<tr>
<td></td>
<td>· Taxis</td>
</tr>
<tr>
<td></td>
<td>· Non-government agency vehicles (e.g., church buses and volunteer group vehicles)</td>
</tr>
<tr>
<td></td>
<td>· Over-the-road coaches, charter buses</td>
</tr>
<tr>
<td></td>
<td>· Trains (e.g., Amtrak or regional train services)</td>
</tr>
<tr>
<td></td>
<td>· Ferries and other boats</td>
</tr>
<tr>
<td></td>
<td>· Planes (commercial and private), helicopters</td>
</tr>
<tr>
<td>6.4.4-C</td>
<td>Address provisions for transporting evacuees, including populations with access and functional needs, to/from rally/destination points.</td>
</tr>
<tr>
<td>6.4.4-D</td>
<td>Determine if evacuees will be informed of their destination before boarding public transport.</td>
</tr>
<tr>
<td>6.4.4-E</td>
<td>Determine if the public will be informed of security measures in place so they are not concerned about leaving possessions behind.</td>
</tr>
<tr>
<td>6.4.4-F</td>
<td>Identify accommodations for the transport of luggage, etc.</td>
</tr>
<tr>
<td></td>
<td>· Identify any size or quantity limitations.</td>
</tr>
<tr>
<td></td>
<td>· Determine how evacuees will be informed of these restrictions.</td>
</tr>
<tr>
<td>6.4.4-G</td>
<td>Establish procedures for the activation of assistance locations (e.g., fuel, water, medical support) at designated points along the evacuation route.</td>
</tr>
<tr>
<td></td>
<td>· Identify the agencies and private companies that may be able to provide necessary resources.</td>
</tr>
<tr>
<td>6.4.4-H</td>
<td>Establish procedures to allow for monitoring the availability of food, water, restrooms, fueling stations, and rest stations for evacuees along the evacuation routes throughout the course of an evacuation.</td>
</tr>
<tr>
<td>6.4.5</td>
<td>Finance</td>
</tr>
</tbody>
</table>
### 6.4.5-A
Determine whether your participating jurisdictions already have expense tracking mechanisms in place.
- If so, follow expense-tracking mechanisms currently in place by your participating jurisdictions.
- If not, follow the expense tracking mechanism procedures established in item 6.1.5-A to track regional expenses during an evacuation.
- Consider how expenditures need to be documented in order to receive reimbursement.

### 6.5
Reception and Support

#### 6.5.1 Command and Control

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
</table>
| 6.5.1-A | Determine how evacuation orders can be amended or revised as a situation develops.  
- Identify who will have the authority to do so.  
- Follow procedures established under item 5.4, *Inter-Agency Communications Systems and Procedures* to notify relevant agencies/jurisdictions of any changes. |
| 6.5.1-B | Establish procedures that allow for regularly scheduled evaluations of response tactics and levels once an incident occurs.  
- Follow procedures established under item 5.4, *Inter-Agency Communications Systems and Procedures* to notify relevant agencies/jurisdictions of any changes.  
- Establish procedures so that decision makers receive regular briefings about incident status and characteristics. |

#### 6.5.2 Planning

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.5.2-A</td>
<td>Identify methods for predicting number of evacuees traveling to each of the identified shelter locations.</td>
</tr>
<tr>
<td>6.5.2-B</td>
<td>Identify method for calculating quantities of needed resources, based on predicted population sizes.</td>
</tr>
</tbody>
</table>

#### 6.5.3 Operations

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
</table>
| 6.5.3-A | Establish procedures to determine appropriate staffing levels required for the full activation of shelters, including those able to take in special needs and vulnerable populations.  
- Refer to item 6.3.2, *Planning* for information on shelter identification.  
- Reach out to appropriate jurisdictions/agencies if staffing levels may exceed internal capabilities. Refer to item 7.2, *Supportive Agreements*. |
| 6.5.3-B | Determine how the public will be made aware of the location of specialty shelters (e.g., animal-friendly, special needs capable). |
| 6.5.3-C | Establish procedures to keep shelter information current during an evacuation (e.g., occupancy/capacity rates).  
- Identify a point of contact to which shelter operators will report information. |
| 6.5.3-D | Establish provisions to keep shelter operators informed of the location and status of alternate shelters. |
| 6.5.3-E | Establish procedures to provide personnel located at shelters up-to-date evacuation information in order to ensure their effective communication with the evacuees at the shelters. |
| **6.5.3-F** | Work with shelter operators to establish procedures for registering shelter populations.  
| | • Understand the policies and procedures of outside shelter operators. Will they share their list of registered shelter evacuees? Is there information they do not request from shelter evacuees that your participating jurisdictions require? Does your region need to have its own personnel on site to conduct its own registration?  
| | • Establish a system for how loved ones may track down family/friends within the shelters. |
| **6.5.3-G** | Determine whether background checks may be performed legally on shelter evacuees. |
| **6.5.3-H** | Determine if some shelter populations need to be segregated from other shelter populations, e.g., how will your participating jurisdictions or region keep registered sex offenders away from children? |
| **6.5.3-I** | Determine how much security may be required at shelter locations.  
| | • Identify the agency responsible for providing security. |
| **6.5.4** | Logistics |
| **6.5.4-A** | Identify the specific resources required by shelters, especially those housing vulnerable and populations with access and functional needs. Examples include:  
| | • Cots  
| | • Food/water  
| | • Medicines and medical supplies (e.g., IVs)  
| | • Pet food and supplies  
| | • Medical personnel (e.g., doctors, nurses, veterinarians)  
| | • Translators/interpreters  
| | • Mental health professionals |
| **6.5.4-B** | Ensure your region either has the required shelter resources or has mutual aid agreements/contracts in place for those resources.  
| | • Refer to items 7.1, Resource Management and 7.2, Support Agreements. |
| **6.5.4-C** | Establish procedures for medical staff and supplies to be distributed to the appropriate shelters.  
| | • Those shelters housing medically fragile populations will require more medical staff and supplies.  
| | • Refer to item 6.3.2, Planning for information on shelter identification and which shelters will house populations with access and functional needs, including medically fragile populations. |
| **6.5.5** | Finance |
| **6.5.5-A** | Determine whether your participating jurisdictions already have expense tracking mechanisms in place.  
| | • If so, follow expense-tracking mechanisms currently in place by your participating jurisdictions.  
| | • If not, follow the expense tracking mechanism procedures established in item 6.1.5-A to track regional expenses during an evacuation.  
<p>| | • Consider how expenditures need to be documented in order to receive reimbursement. |
| <strong>6.6</strong> | Return |
| <strong>6.6.1</strong> | Command and Control |</p>
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.6.1-A</td>
<td>Determine who within your region has the legal authority to declare evacuation operations complete and allow the public to return to the affected area.</td>
</tr>
<tr>
<td></td>
<td>- Ensure the person with authority is aware of the steps that must be taken.</td>
</tr>
<tr>
<td></td>
<td>- Follow procedures established under item 5.4, <em>Inter-Agency Communications Systems and Procedures</em> to notify relevant agencies/jurisdictions of any changes.</td>
</tr>
<tr>
<td>6.6.1-B</td>
<td>Establish procedures to determine when the command structure can be deactivated.</td>
</tr>
<tr>
<td></td>
<td>- Determine who may be involved in this decision.</td>
</tr>
<tr>
<td></td>
<td>- Ensure deactivation does not occur before shelters are closed.</td>
</tr>
<tr>
<td>6.6.2</td>
<td>Planning</td>
</tr>
<tr>
<td>6.6.2-A</td>
<td>Determine what criteria will be used to determine when it is appropriate to end the evacuation activities and to begin permitting citizens to return to the evacuated area.</td>
</tr>
<tr>
<td></td>
<td>- Cessation of threat</td>
</tr>
<tr>
<td></td>
<td>- Safety of evacuated area (structural issues, law enforcement, etc.)</td>
</tr>
<tr>
<td></td>
<td>- Quality of life (public utilities, etc.).</td>
</tr>
<tr>
<td>6.6.2-B</td>
<td>Identify what criteria will be used to determine the timing for vacating shelters.</td>
</tr>
<tr>
<td></td>
<td>- Safety of the evacuated area.</td>
</tr>
<tr>
<td></td>
<td>- Availability of transportation from shelters to the evacuated area.</td>
</tr>
<tr>
<td>6.6.2-C</td>
<td>Determine what transportation options may be available to help relocate evacuees from shelters back to the evacuated area.</td>
</tr>
<tr>
<td>6.6.3</td>
<td>Operations</td>
</tr>
<tr>
<td>6.6.3-A</td>
<td>Establish procedures to notify all evacuation personnel (e.g., emergency management, transportation, support agencies) when the re-entry phase of the evacuation will be implemented.</td>
</tr>
<tr>
<td></td>
<td>- Refer to item 5.4, <em>Inter-Agency Communications Systems and Procedures</em> for potential communication methods.</td>
</tr>
<tr>
<td>6.6.3-B</td>
<td>Determine the factors that will influence a re-entry decision. Considerations include:</td>
</tr>
<tr>
<td></td>
<td>- Extent of damage to the area(s) where evacuees will return has been assessed.</td>
</tr>
<tr>
<td></td>
<td>- Businesses are operating.</td>
</tr>
<tr>
<td></td>
<td>- Public able to obtain basic goods and food.</td>
</tr>
<tr>
<td></td>
<td>- Outbreaks of disease/any other health/medical issue have been addressed.</td>
</tr>
<tr>
<td></td>
<td>- Hazardous material spills have been cleaned up.</td>
</tr>
<tr>
<td></td>
<td>- Utilities are functioning (e.g., water running to the homes/businesses, available electricity).</td>
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<tr>
<td></td>
<td>- Evacuation routes are clear of debris and safe for travel.</td>
</tr>
<tr>
<td></td>
<td>- Public transit systems are operational.</td>
</tr>
<tr>
<td></td>
<td>- Environmental factors have been assessed.</td>
</tr>
<tr>
<td></td>
<td>- Injured or deceased persons and animals have been attended to and removed from the area(s).</td>
</tr>
<tr>
<td>6.6.3-C</td>
<td>Determine whether the evacuation plan will include provisions to transport those evacuees who did not self-evacuate back to their place of residence.</td>
</tr>
</tbody>
</table>
| 6.6.3-D | Determine what transportation options may be available for evacuees returning to the area.  
  - Are there set drop-off points? (Potentially the same as the rally/assembly points, such as intermodal centers with transportation available). Will there be transportation available at the drop off points? Would it be an option to take people directly to their homes?  
  - Will evacuees be provided transportation to leave from the shelters? From other destination points?  
  - How will this information be communicated to the public? |
| 6.6.3-E | Determine whether the evacuation plan will include provisions to assist those evacuees who did not self-evacuate in reuniting with family members. |
| 6.6.3-F | Establish procedures to determine whether there are any populations that will not be allowed to return due to health/medical or public safety concerns. |
| 6.6.3-G | Identify the methods of communication to be used to communicate re-entry procedures with the public.  
  - Refer to item 5.5, Public Communications. |
| 6.6.3-H | Determine the types of information that will be communicated to the public about re-entry procedures (e.g., phased re-entry, available routes, timetable, etc.). |
| 6.6.3-I | Determine the estimated number of law enforcement personnel required to monitor re-entry. Areas to consider include but are not limited to:  
  - Re-entry routes  
  - Major chokepoints (refer to item 6.3.3, Operations for a partial list of identified chokepoints)  
  - Shelters  
  - Drop-off points |
| 6.6.3-J | Establish procedures for deactivating sheltering facilities.  
  - Determine whether all shelters will close at once or if it will be done in phases.  
  - Ensure that there is always an available shelter for populations with access and functional needs, including medically dependent individuals and animals. |
| 6.6.4 | Logistics |
| 6.6.4-A | Identify personnel resources and equipment required to support re-entry.  
  - Refer to item 7.1, Resource Management. |
| 6.6.4-B | Identify the resources required to transport evacuees back to the affected area.  
  - Refer to item 7.1, Resource Management. |
| 6.6.5 | Finance |
| 6.6.5-A | Determine whether your participating jurisdictions already have expense tracking mechanisms in place.  
  - If so, follow expense-tracking mechanisms currently in place by your participating jurisdictions.  
  - If not, follow the expense tracking mechanism procedures established in item 6.1.5-A to track regional expenses during an evacuation.  
  - Consider how expenditures need to be documented in order to receive reimbursement. |
<p>| 7.0 | Administration |
| 7.0-A | Determine whether the elements of this section already exist in a previously written plan (e.g., a CEMP), and can simply be included in the evacuation plan by reference. |</p>
<table>
<thead>
<tr>
<th>7.1</th>
<th>Resource Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1-A</td>
<td>Determine the resources necessary to perform evacuation operations.</td>
</tr>
<tr>
<td></td>
<td>- Identify categories of resources based on type and kind.</td>
</tr>
<tr>
<td></td>
<td>- Identify operational activities that will require specific resources and the quantity for each (e.g., support of evacuation routes).</td>
</tr>
<tr>
<td>7.1-B</td>
<td>Establish procedures for contacting agencies identified in item 1.2.3, <em>Parties Involved in Planning and Conducting an Evacuation</em>, to determine the resources they may require to perform their role during an evacuation.</td>
</tr>
<tr>
<td></td>
<td>- Ensure each agency determines its needs and identifies the corresponding resources.</td>
</tr>
<tr>
<td>7.1-C</td>
<td>Determine which of the pre-identified resources your region has in-house.</td>
</tr>
<tr>
<td></td>
<td>- Identify in-house agencies with resources, including a point of contact for each agency.</td>
</tr>
<tr>
<td></td>
<td>- Collect resource inventories from those agencies.</td>
</tr>
<tr>
<td>7.1-D</td>
<td>Determine the location and status (availability, state of repair etc.) of in-house resources.</td>
</tr>
<tr>
<td>7.1-E</td>
<td>Prepare a region-wide inventory of resources required to respond to evacuation operations. Inventory will include at a minimum the quantity, location, availability of identified resources, and the controlling agency of each resource.</td>
</tr>
<tr>
<td></td>
<td>- Establish procedures for updating the inventory on a regular basis.</td>
</tr>
<tr>
<td></td>
<td>- Determine the agency responsible for updating the inventory.</td>
</tr>
<tr>
<td></td>
<td>- Determine a point of contact for the resource inventory.</td>
</tr>
<tr>
<td>7.1-F</td>
<td>Establish protocols to avoid the double counting of resources by multiple agencies.</td>
</tr>
<tr>
<td></td>
<td>- Refer to the region-wide resource inventory.</td>
</tr>
<tr>
<td>7.1-G</td>
<td>Address resource gaps.</td>
</tr>
<tr>
<td></td>
<td>- Identify the gaps between required resources and those resources available, within each agency.</td>
</tr>
<tr>
<td></td>
<td>- Determine the resources that must be obtained from other jurisdictions, organizations, and private-sector companies.</td>
</tr>
<tr>
<td></td>
<td>- Identify jurisdictions, organizations, and private-sector companies likely to have the required resources necessary to address the resource gaps.</td>
</tr>
<tr>
<td></td>
<td>- Refer to item 7.2, <em>Supportive Agreements</em> for information on how to arrange outside resources and support.</td>
</tr>
<tr>
<td>7.1-H</td>
<td>Determine transportation methods for moving resources.</td>
</tr>
<tr>
<td></td>
<td>- Identify anticipated origins/destinations.</td>
</tr>
<tr>
<td></td>
<td>- Identify anticipated vehicle locations and capacities.</td>
</tr>
<tr>
<td></td>
<td>- Establish procedures for moving resources, including the identification of personnel necessary to physically transport the resources.</td>
</tr>
<tr>
<td>7.1-I</td>
<td>Establish procedures for tracking resources during the entire duration of an evacuation operation.</td>
</tr>
<tr>
<td></td>
<td>- Track resources from when they are mobilized until they are demobilized and returned to the controlling agency.</td>
</tr>
<tr>
<td></td>
<td>- Use ICS protocols set forth in ICS 300: <em>Intermediate ICS for Expanding Incidents</em>, Unit 6, to track resources during actual evacuation operations.</td>
</tr>
</tbody>
</table>
### 7.2 Supportive Agreements

#### 7.2-A
Establish appropriate mutual aid agreements with neighboring jurisdictions to address resource gaps.
- Refer to information gathered under item 7.1, *Resource Management* for a list of resources not available in-house as well as the jurisdictions likely to have the required resources.
- Contact jurisdictions with wish lists of required resources.
- Establish mutual aid provisions and circumstances.
- Prepare and sign mutual aid agreements.

#### 7.2-B
Establish appropriate MOUs or contracts with outside organizations and private-sector companies to address resource gaps.
- Refer to information gathered under item 7.1, *Resource Management* for a list of resources not available in-house as well as the organizations and private-sector companies likely to have the required resources.
- Contact organizations and private-sector companies with wish lists of required resources.
- Establish contract provisions and circumstances.
- Prepare and sign MOUs/contracts.

#### 7.2-C
Determine if standby contracts exist (e.g., motor coach companies, paratransit providers, ambulance companies, railroads, air carriers, etc.) to obtain operators and equipment to fill identified shortfalls.
- Establish procedures for reviewing mutual aid agreements and contracts on a regular basis.

### 7.3 Emergency Funding Mechanisms

#### 7.3-A
Determine what enabling legislation exists for your participating jurisdictions with regard to emergency funding.

#### 7.3-B
Ensure the necessary provisions exist within the enabling legislation or appropriate emergency management plan.

#### 7.3-C
Determine if any steps need to be taken before your participating jurisdictions or regional entity is able to activate emergency funding mechanisms in response to an incident, e.g., Must an authority (mayor, governor, etc.) first declare a state of emergency.

### 7.4 Post-Evacuation Reimbursement Claims

#### 7.4-A
Review whether your participating jurisdictions already have expense tracking mechanisms in place.
- If so, follow expense-tracking mechanisms currently in place by your participating jurisdictions.
- If not, follow the expense tracking mechanism procedures established in item 6.1.5-A to track regional expenses during an evacuation.
- Consider how expenditures need to be documented in order to receive reimbursement.

#### 7.4-B
Coordinate with county and state officials to determine the information that will be required when submitting compensation claims.
- Establish procedures for agencies/personnel to follow during an evacuation in order to collect the information required for compensation claim submission.

### 7.5 Post-Evacuation After-Action Reports
| 7.5-A | Establish procedures to assemble critical data regarding evacuation performance in the aftermath of an evacuation.  
  - Include information gathered from debriefing relevant agencies and staff.  
  - Include information on the integrity of infrastructure needed/used to execute the evacuation (e.g., forensic investigations). |
| 7.5-B | Establish procedures to debrief agencies and staff that had any role in the evacuation operation.  
  - Request information on critical successes and failures that occurred during the evacuation. |
| 7.5-C | Identify and document any critical successes during the evacuation. |
| 7.5-D | Identify and document any failures or breakdown in procedures during the evacuation. |
| 7.5-E | Establish procedures to incorporate information gathered from debriefings into an after-action report (AAR).  
  - Ensure the AAR documents lessons-learned.  
  - Ensure the AAR documents agreed-upon methods to address performance gaps. |
| 7.5-F | Refer to item 9.0, Plan Review and Maintenance for procedures on how to incorporate information captured by AARs into updated evacuation plan revisions. |
| 8.0 | Plan Review and Maintenance |
| 8.0-A | Designate an agency (hereinafter called the host agency) within your region to update and maintain the evacuation plan on a regular basis.  
  The host agency:  
  - Must have the resources available to regularly update and maintain the evacuation plan.  
  - Will be responsible for communicating on a regular basis with all agencies and neighboring jurisdictions that will be involved in evacuation operations about all aspects of the evacuation plan. |
| 8.0-B | Provide those agencies and neighboring jurisdictions that will have a role during an evacuation a copy of the evacuation plan.  
  - Refer to the agencies and neighboring jurisdictions previously identified under item 1.2.3, Parties Involved in Planning and Conducting an Evacuation. |
| 8.0-C | Establish a timeframe for reviewing the evacuation plan on a regular basis, e.g., quarterly, bi-annually, or annually. |
| 8.0-D | Establish procedures to be used during the evacuation plan review process on how each relevant agency/jurisdiction will submit suggested updates/changes of the regional evacuation plan.  
  - Determine the format in which suggestions need to be submitted.  
  - Identify to whom suggestions must be submitted.  
  - Determine how much time agencies/jurisdictions will have to submit suggestions. |
| 8.0-E | Require each reviewing agency/jurisdiction to assess whether it met the applicable evacuation plan objectives previously set forth.  
  - Refer to item 1.1, Purpose for Established Objectives and Metrics.  
  - Each agency/jurisdiction will reevaluate the pre-determined performance metrics currently in place.  
  - Suggested changes to performance metrics will be submitted under the guidelines described by the review process. |
<p>| 8.0-F | Incorporate relevant information captured by AARs from exercises and live incidents into updated evacuation plan revisions. |</p>
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
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<tbody>
<tr>
<td>8.0-G</td>
<td>Determine what process updates/changes will need to go through in order to officially be incorporated into the evacuation plan.</td>
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<td></td>
<td>- Is there a review committee that decides what suggestions to incorporate? If so, how is the committee selected? How many members on the committee? Majority rules or unanimous decision? Are all votes weighted equally or does it depend on the positions of committee members?</td>
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<td>- Is it the responsibility of one individual to decide what suggestions to incorporate? If so, identify this individual.</td>
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<td>8.0-H</td>
<td>Identify the authority (by position) that has the legal power to approve updated revisions of the evacuation plan.</td>
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<tr>
<td>8.0-I</td>
<td>Brief the authority on the proposed changes.</td>
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<tr>
<td>8.0-J</td>
<td>Distribute revised editions of the plan to all relevant agencies, organizations, and jurisdictions once legally approved.</td>
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<tr>
<td>8.0-K</td>
<td>Determine other plans within your region into which elements of the evacuation plan must be integrated.</td>
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<td></td>
<td>- Refer to plans identified under item 1.2.4, Coordination with Other Plans and Guidance.</td>
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<td>- Contact those agencies to receive copies of their plans.</td>
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<tr>
<td>8.0-L</td>
<td>Determine the plans from outside agencies/jurisdictions in which the evacuation plan must be integrated.</td>
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<td></td>
<td>- Refer to plans identified under item 1.2.4, Coordination with Other Plans and Guidance.</td>
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<td></td>
<td>- Contact those outside agencies/jurisdictions to receive copies of their plans.</td>
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<tr>
<td>8.0-M</td>
<td>Create a list of points of contact for all plans (both in-house and from outside agencies) that must be integrated with the evacuation plan.</td>
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<tr>
<td>8.0-N</td>
<td>Review plan integration during the regularly scheduled evacuation plan review process.</td>
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<tr>
<td>9.0</td>
<td>Training and Exercises</td>
</tr>
<tr>
<td>9.0-A</td>
<td>Identify all agencies and personnel with a role in an evacuation that requires training on the evacuation procedures outlined by the evacuation plan.</td>
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<tr>
<td>9.0-B</td>
<td>Determine required levels of training for identified personnel.</td>
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<tr>
<td>9.0-C</td>
<td>Determine what type(s) of trainings and exercises (e.g., seminar, workshop, tabletop, game, drill, functional or full-scale) your region will hold in order to test evacuation procedures.</td>
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<td>- Refer to the training/exercise budget of your participating jurisdictions or regional entity.</td>
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<td>9.0-D</td>
<td>Establish a timeline for conducting the training and exercises once the types and number of exercises has been determined.</td>
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<td>9.0-E</td>
<td>Conduct an annual review of the exercise and training timeline to ensure it is being followed and to assess whether any schedule changes need to be made.</td>
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<td>9.0-F</td>
<td>Conduct an after-action conference to receive feedback on the strengths and weaknesses of the exercise once it is held.</td>
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<td>- Reach out to all exercise participants</td>
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<td>- Schedule an after-action conference</td>
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<td>- Gather comments and suggestions made at the conference</td>
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<tr>
<td>9.0-G</td>
<td>Distribute the after-action report from an exercise to all exercise participants.</td>
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<tr>
<td>9.0-H</td>
<td>Distribute the after-action report from an exercise to all agencies/jurisdictions that will be involved in an evacuation.</td>
</tr>
<tr>
<td>9.0-I</td>
<td>Incorporate suggestions/changes from the exercise AAR into future exercises.</td>
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</table>
Appendix A4: Checklist of Potential Stakeholders

Identify stakeholders pertinent to the region that may collaborate in planning for, responding to, or recovering from a disaster or provide support for a major planned event. Identify local contacts for applicable stakeholder groups.

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Emergency/Disaster</th>
<th>Planned Event</th>
<th>Does Not Apply</th>
<th>Comments/Contact Information</th>
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<td><strong>Federal Stakeholders:</strong></td>
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<td>Maritime Administration (MARAD)</td>
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<td>Federal Motor Carrier Safety Administration (FMCSA) and other U.S. DOT modal administrations as appropriate</td>
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<td>FEMA</td>
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<td>Transportation Security Administration (TSA)</td>
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<td>U.S. Coast Guard</td>
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<td>U.S. Customs and Border Protection</td>
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<td>Science and technology federal research agencies and national laboratories</td>
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<td>U.S. Secret Service</td>
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<td><em>Health and Human Services (HHS)</em></td>
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<td>Centers for Disease Control and Prevention (CDC)</td>
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<td>Administration on Aging (AoA)</td>
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<td>Regional offices</td>
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<td>National Oceanic and Atmospheric Administration – Catch Sharing Plan</td>
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<td>DOC-Interstate Commerce-permitting for utility workers and equipment to traverse non-impacted states</td>
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<td>American Association of State Highway Transportation Officials (AASHTO)</td>
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<td>(BCLC)- affiliate of U.S. Chamber of Commerce focused on business/ government partnerships for emergencies</td>
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<td>Business Executives for National Security (BENS)</td>
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<td>National Traffic Incident Management Coalition (NTIMC)</td>
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<td>National Motor Freight Association (NMFA)</td>
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<td>Freight forwarders associations (e.g., Air Freight Forwarders Association (AFFA))</td>
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<td>American Shortline and Regional Railroad Association (ASLRRA)</td>
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<td>American Bus Association (ABA)</td>
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<td>American Trucking Association (ATA)</td>
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<td>American Waterways Operators (AWO)</td>
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<td>Inland Rivers, Ports &amp; Terminals Association (IRPTA)</td>
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<td>Gulf Intercostal Canal Association (GICA)</td>
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<td>Retail Industry Leaders Association (RILA)</td>
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<td><strong>National Emergency Management Organizations</strong></td>
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<td>International Association</td>
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<td>of Emergency Managers (IAEM)</td>
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<td>Disaster Training schools- and consortia. E.g.- Emergency Management Institute (EMI), National Disaster Preparedness Training Center (NDPTC), Texas Engineering Extension Service (TEEX)</td>
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<td>National Emergency Management Association (NEMA)</td>
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<td>National Fire Protection Association (NFPA)</td>
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<td>National Emergency Medical Services Association (NEMSA)</td>
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<td>National Alliance for State Animal and Agricultural Emergency Programs (NASAAEP)</td>
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<td><strong>National Non-Governmental Organizations (NGOs) (with local chapters)</strong></td>
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<td>American Red Cross</td>
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<td>Independent Living Centers</td>
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<td>American Associations of Retired Persons (AARP)</td>
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<td>Faith-based Organizations (e.g., Salvation Army, Catholic Charities)</td>
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<td>Non-Profit Organizations with a niche focus on emergency management- e.g., Easter Seals (disabled community); Save the Children (caring for children in emergency situations)</td>
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<td>National Animal Rescue</td>
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<td>and Sheltering Coalition (NARSC)</td>
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<td>American Veterinary Medical Association (AVMA)</td>
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<td>Agencies that provide services to people who are blind or have low vision; deaf or hard of hearing; who have mobility, sensory, or cognitive limitations; who have no or limited English proficiency; who have low income; and who are very young or very old.</td>
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<td>State Stakeholders:</td>
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<td><strong>State DOTs</strong></td>
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<td>Transportation agencies- highway-airport- transit- freight-maritime- rail</td>
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<td>Territorial equivalents of transportation agencies</td>
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<td>Traffic operations offices/ Intelligent Transportation Systems (ITS) sections</td>
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<td>Safety Offices</td>
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<td>Departments of Environmental Protection (DEP)</td>
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<td>Other state, territorial, and tribal agencies (including statewide authorities)</td>
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<td>Department of Health</td>
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<td><strong>Law Enforcement/ Emergency Services</strong></td>
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<td>State emergency management offices/Emergency Management Assistance Compact (EMAC) partners</td>
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<td>Stakeholders</td>
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<td>State Rail Associations (AAR)</td>
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<td>State Trucking Associations (STA, part of ATA)</td>
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<td>Tribal Planning Organizations. Tribal transportation planning organizations, often part of state DOTs</td>
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<td>Fusion Centers</td>
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<td>Emergency Operations Centers (EOCs)- State, regional, and/or local</td>
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<td>Bi-state authorities, such as Expressway Authorities</td>
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<td>Local Government Agencies:</td>
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<tr>
<td>City and County</td>
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<tr>
<td>Public Works departments</td>
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<tr>
<td>Traffic engineering departments</td>
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<tr>
<td>Planning, land use, and transport (through MPOs)</td>
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<tr>
<td>Transit agencies, both public and private, including school buses</td>
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<tr>
<td>Law Enforcement/Emergency Services</td>
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<td>Law enforcement (police and sheriffs)</td>
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<tr>
<td>Stakeholders</td>
<td>Emergency/Disaster</td>
<td>Planned Event</td>
<td>Does Not Apply</td>
<td>Comments/Contact Information</td>
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<td>Fire and rescue</td>
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<td>Emergency Medical Services (EMS)</td>
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<td>Medical examiners/ coroners</td>
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<td>Hazmat services</td>
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<td>Dispatch services</td>
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<td>Public health</td>
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<td><strong>Utilities:</strong></td>
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<td>Water departments</td>
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<tr>
<td>Wastewater departments</td>
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<tr>
<td>Gas and electric power companies</td>
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<td>Communications companies</td>
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<td><strong>Private Companies:</strong></td>
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<td>Towing and recovery operators</td>
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<tr>
<td>Towing and barge owners and operators</td>
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<tr>
<td>Heavy equipment owners and operators</td>
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<td>Hazardous Materials (HAZMAT) Contractors</td>
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<td>Motor carrier companies</td>
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<td>Insurance Companies</td>
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<td>Traffic media</td>
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<tr>
<td>Livery (rail and freight)</td>
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<td>Paratransit service providers</td>
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<td>Air freight/air charter</td>
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<td><strong>Other Local Community Organizations:</strong></td>
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<tr>
<td>Community Emergency Response Teams (CERT)</td>
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<td>Volunteer Organizations Active in Disasters (VOAD)</td>
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<tr>
<td>United We Ride (UWR), mandated collaboration for transportation services between social service providers</td>
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<tr>
<td>Chambers of Commerce</td>
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<tr>
<td>Citizens’ and neighborhood groups</td>
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<tr>
<td>Local livestock associations (e.g.,</td>
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<td>Stakeholders</td>
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<td><strong>Emergency/Disaster</strong></td>
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<td><strong>Planned Event</strong></td>
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<td><strong>Does Not Apply</strong></td>
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<td><strong>Comments/Contact Information</strong></td>
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<tr>
<td>Cattlemen’s Association)</td>
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<td>Local animal rescue/shelter organizations</td>
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<tr>
<td>Community-Based Organizations (CBOs) (e.g., food banks, multi-cultural chambers of commerce and community centers)</td>
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<td><strong>Transportation Sector:</strong></td>
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<tr>
<td>Trucking associations</td>
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<td>Freight rail operators</td>
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<td>Technical Societies (ITS State Chapter, State Section Institute of Transportation Engineers (ITE))</td>
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<td>Automobile associations</td>
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<td><strong>Event/Sports Venues:</strong></td>
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<td><strong>Venues</strong></td>
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<td>Arenas</td>
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<tr>
<td>Stadiums</td>
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<tr>
<td>NASCAR and other racing</td>
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<tr>
<td>Field sport (e.g., soccer/baseball) complexes</td>
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<td>Golf courses</td>
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<tr>
<td><strong>Designated Venues</strong></td>
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<tr>
<td>Major League Baseball playoffs, World Series, All-Star games</td>
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<tr>
<td>National Football League Super Bowl</td>
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<tr>
<td>Professional Golf Association and Ladies Professional Golf Association (major tournaments, e.g., U.S. Open)</td>
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<tr>
<td>NASCAR races</td>
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<tr>
<td>Operation Sail</td>
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<tr>
<td>Major League Soccer Championship</td>
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<tr>
<td>National level conventions</td>
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</tbody>
</table>
Appendix A4: Transportation Resources Detailed Checklist

In advance, tally the numbers of each resource that could be available for a disaster, emergency, or significant event. Use comments column to note any concerns about accessing the resource, confirmed availability, additional needs, etc.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Number of Assets</th>
<th>Emergency Disaster</th>
<th>Planned Event</th>
<th>Does Not Apply</th>
<th>Comments Contact Information</th>
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</thead>
<tbody>
<tr>
<td><strong>Equipment and assets</strong></td>
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<tr>
<td>Barricades</td>
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<tr>
<td>Emergency Management Agency (EMA) units for interoperable communication</td>
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<tr>
<td>Fixed traffic cameras that feed into the Emergency Operations Center (EOC)</td>
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<tr>
<td>Installations at selected sites that can be activated as needed</td>
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<tr>
<td>Laptops to control fixed camera tilt, zoom, and timing</td>
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<tr>
<td>Mobile units to cover dead zones</td>
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<td>Portable units for network operations</td>
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<td>Real-time traffic counters</td>
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<td>Reflector cones</td>
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<tr>
<td>Traffic control equipment</td>
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<tr>
<td>Variable Message Signs (VMS) – permanent and portable</td>
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<tr>
<td><strong>Situational awareness</strong></td>
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<tr>
<td>Flow maps for traffic capacity and time</td>
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<tr>
<td>GIS maps</td>
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<tr>
<td>Laser Imaging Defining Radar (LIDR), a mapping system that collects elevation information and is tied with the flood stage</td>
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<tr>
<td>Resources</td>
<td>Number of Assets Status</td>
<td>Emergency Disaster</td>
<td>Planned Event</td>
<td>Does Not Apply</td>
<td>Comments Contact Information</td>
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<tr>
<td>Transportation Management Centers (TMCs)</td>
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<tr>
<td>Security cameras for critical infrastructure</td>
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<tr>
<td>Intrusion detection systems for critical infrastructure (e.g., bridges, hatches, control centers)</td>
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</table>

**Management**

- Communication – Intragency, interagency and external with the public
  - WebEOC or similar software program
  - Website and other electronic communication
  - Satellite phones
- Evacuation maps (updated annually)
- Strategies – e.g., toll waiver policy, reverse lanes, traffic management (e.g., turn prohibitions)

**Personnel**

- ICS training
- NIMS compliance
- First responder standard ID
- Maintenance personnel
- Mid-level staff or administrative staff to sit in the EOC
- National Guard to assist with traffic control, security, crowd control
- Operations personnel in the EOC
- People at barricades
- Person in the field to assess actual conditions and remain in contact with the EOC
- Traffic officers at key intersections
<table>
<thead>
<tr>
<th>Resources</th>
<th>Number of Assets Status</th>
<th>Emergency Disaster</th>
<th>Planned Event</th>
<th>Does Not Apply</th>
<th>Comments Contact Information</th>
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<tbody>
<tr>
<td>Routes</td>
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<tr>
<td>Arterial roads</td>
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<tr>
<td>Freeways</td>
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<tr>
<td>Highways – interstate, federal, state, and county</td>
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<tr>
<td>Bridges</td>
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<tr>
<td>Tunnels</td>
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<tr>
<td>Rail lines</td>
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<td>Waterways</td>
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<tr>
<td>Vehicles</td>
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<td>DOT and police SUVs with cameras</td>
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<td>Heavy equipment- e.g. earth movers, backhoes, bulldozers (may be through contractors) - debris removal, reconstruction</td>
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<td>Mobile command centers</td>
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<td>Police helicopters with cameras</td>
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<td>Snow plows, other snow removal equipment</td>
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<td>Trucks equipped with radios</td>
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<tr>
<td>Vehicles equipped with reflector cones and VMS in the field</td>
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<td>Vehicles equipped for hazmat response</td>
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<tr>
<td>Emergency Management</td>
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<tr>
<td>Equipment and Assets</td>
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<tr>
<td>NTAS/ Reverse 9-1-1® emergency alert notification</td>
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<td>Event radio channels to communicate with people in field</td>
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<td>Hardwired, secure telephone lines with direct links to regional municipalities</td>
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<td>Voice Interoperable Program for</td>
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<td>Resources</td>
<td>Number of Assets Status</td>
<td>Emergency Disaster</td>
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<tr>
<td>Emergency Response (VIPER) on mobile phones on same frequency</td>
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<td><strong>Situational Awareness</strong></td>
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<tr>
<td>Satellite phones</td>
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<tr>
<td>Critical infrastructure adjacent to facilities</td>
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<td>Maps of hurricane and surge zones, flood zones, wildfires, etc.</td>
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<tr>
<td>Registry for access and functional needs populations, medical special needs, pets, livestock – updated bi-annually</td>
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<tr>
<td>State Medical Asset Resource and Tracking Tool, a web-based tool to track hospital bed count daily</td>
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<td>Trigger points and evacuation timeline</td>
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<td><strong>Management</strong></td>
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<td>Web EOC, E-team</td>
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<tr>
<td>Annual county inventory of medical special needs/ fragile populations and available ambulances</td>
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<tr>
<td>Annual inventory of resources in counties not at risk</td>
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<td>Clearly defined roles and responsibilities for all agencies participating in the evacuation</td>
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<td>Gap analysis between number of vehicles available and number needed for evacuation</td>
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<tr>
<td>List of vehicles in county available for evacuation</td>
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<tr>
<td>Private Assets Logistics Management (PALM) system that manages private sector assets</td>
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<td>Resources</td>
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<tr>
<td>that can be accessed during an evacuation</td>
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<td>Standard Operating Guidelines (SOG), updated every two years</td>
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<td>Contacts in other agencies for real-time information</td>
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<td>EM personnel in EOC with decision making authority</td>
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<td>State Incident Management Team available to help counties with evacuation</td>
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<td>Logistics staff to coordinate resources and resource requests</td>
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<td>Personnel to update registry information</td>
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<td><strong>Vehicles</strong></td>
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<td>Ambulances (basic life support, advanced life support, bariatric) – private and public</td>
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<td>Para transit vehicles</td>
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<td>EM vehicles</td>
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<td>School buses for areas without mass transit</td>
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<td>211/311 non-emergency numbers</td>
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<td>Digital warehouse-demographic, land use, traffic data</td>
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<td>GIS maps</td>
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<td>Mapping tool to provide: information to evaluate placement of law enforcement and equipment</td>
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<td>Hurricane tracking</td>
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<td>Traffic flow information including contra flow map</td>
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<td>Modeling capabilities</td>
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<td>Evacuation models by zip code, traffic analysis zone / neighborhood, city, county or state</td>
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<td>Hurricane models</td>
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<td>Monitoring of blue tooth numbers/other probe data to monitor traffic flow</td>
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<td>Reliable data from traffic cameras</td>
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<td>Centralized Traffic Operations Center (TOC)</td>
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<td>Convening leaders of different agencies to discuss evacuation plans</td>
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<td>Funding coordination</td>
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<td>Study to help public information officers access functional needs populations</td>
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<td>Staff support to committees for planning and after-action reviews</td>
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<td>GIS Staff</td>
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<td>Evacuation route signage</td>
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<td>Generators at transit facilities</td>
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<td>GPS on buses</td>
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<td>Meters in stations to count number of people allowed into stations</td>
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<td>Parking lots where stalled vehicles can be towed</td>
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<td>Queue ropes</td>
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<td>Radios on buses</td>
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<td>Subway Stations (both non-accessible and ADA accessible)</td>
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<td><strong>Situational Awareness</strong></td>
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<td>Assessment to identify number of people who need assistance to evacuate from special facilities, their physical characteristics (e.g., ambulatory, able to transfer from wheelchair to bus seat, needs wheelchair, needs stretcher) and the type of vehicle they need</td>
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<td>Estimates of time required to load and unload buses, drive to destination and return</td>
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<td>Hyper alert application for mobile phones to alert staff and operators</td>
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<td>Drivers/ operators as real-time view of roadway status, people’s</td>
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<td>Joint Rail Control Center</td>
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<td>Maps for drivers (e.g., to off-site bus storage areas, pickup, transfer, and drop off points)</td>
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<td>3-1-1 System to coordinate requests for evacuation transportation</td>
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<td>Communication – Internal, interagency and external</td>
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<td>• Employee preparedness letters</td>
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<td>• Social media</td>
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<td>Credentials/identification for all personnel</td>
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<td>Designated pickup and transfer points</td>
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<td>Documents to track assets and operators’ hours</td>
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<td>Off-site vehicle storage</td>
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<td>Registry (2-1-1, access and functional needs, medical special needs)</td>
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<td>Shelter for transit facility personnel</td>
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<td>Signal systems</td>
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<td>Software that integrates resource requests with reimbursement</td>
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<td>Transportation resources database to track vehicle status</td>
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<td>WebEOC</td>
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<td>Transit personnel to track vehicles and number of evacuees (if an evacuation event)</td>
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<td><strong>Vehicles</strong></td>
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<td>Arterial roads</td>
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<td>Freeways</td>
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<td>Highways- interstate, federal, state, and county</td>
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<td>Bridges</td>
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<td>Tunnels</td>
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<td><strong>Vehicles</strong></td>
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<td>Buses- Numbers, sizes, capacities (regular seats), capacity (wheel chairs), lift equipped, axle height (for flooding), turning radius (for suitability for neighborhoods), fuel type (e.g., natural gases buses will have limited range outside normal fueling radius)</td>
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<td>Paratransit vehicles-number, capacity for wheelchairs, regular seats</td>
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<td>Street cars – same information as subways</td>
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<td>Commuter rail- same information as subways – dual power?</td>
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<td><strong>Private Sector Partners</strong></td>
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<td>Communications, Owner, and Operators of Critical Infrastructure</td>
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<td>Routes</td>
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<td>Community-based/Faith-based Organizations (CBOs/FBOs)</td>
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Appendix A4: Strategies to Exercise Regional Transportation Plan for Disasters, Emergencies and Significant Events Checklist

In conjunction with other training guidance use this document as a high-level checklist to carry out the exercise program.

Resources:
2. FEMA Training- Homeland Security Exercise Evaluation Program (HSEEP)

<table>
<thead>
<tr>
<th>STRATEGIES</th>
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<tbody>
<tr>
<td>Initiate exercise program management by developing and executing an exercise program.</td>
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<tr>
<td>1. Multi-year training and exercise program planning (planned exercises on specific dates).</td>
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<td>2. Planning and executing individual exercises.</td>
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<td>3. Tracking improvements.</td>
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**Develop exercise documentation** - Exercise documents are the most tangible elements of design and development. Different exercise types require different documentation. They may range from simple sign-in sheets to media releases and exercise evaluation guides.

1. **Situation manual** - A situation manual (SITMAN) is the participant handbook for discussion-based exercises. It provides background information on the scope, schedule, and objectives for the exercise. It also presents the scenario narrative for participant discussions during the exercise.

2. **Exercise plan** - The exercise plan (EXPLAN) is the participant handbook for operations-based exercises. The EXPLAN provides controllers, evaluators, players, and observers with information such as the exercise purpose, scope, objectives, and logistical information.

3. **Controller evaluator handbook** - Controller evaluator (C/E) handbooks supplement EXPLANS for operations-based exercises. The C/E handbook contains information in more detail about the exercise scenario and guides controllers and evaluators in their roles and responsibilities.

4. **Master Scenario Events List** - The Master Scenario Events List contains a chronological listing of the events and injects that drive operations-based exercise play.

5. **Exercise Evaluation Guides** - Exercise Evaluation Guides (EEGs) provide evaluators with a checklist of critical tasks to be completed by participants during an exercise. EEGs contain the information to
Develop the evaluation of the exercise that assesses performance on three levels:

1. **Task level** – Assesses the ability of individual players or teams to perform a required task during an exercise.
2. **Organization level** – Assesses the ability of an organization, discipline, or function to perform its role in responding to an event.
3. **Mission level** – Assesses the ability of the intergovernmental community as a whole within the region to achieve expected outcomes in responding to an event.

Develop a structured testing schedule. Testing should occur at least annually for an entire organization. All new incoming employees should be briefed on the plan, or should take full training if they will be directly involved in emergency events.

Determine which target groups will be included in the testing of plans.

- First responders
- Emergency management personnel
- New hire employees
- Existing employees
- General public
- Private sector representatives

Decide which type of exercise should be used to test the plan.

- Discussion-based exercise? (Centers on participant discussion.)
- Operations-based exercise? (Focuses on action-oriented activities such as deployment of resources and personnel.)

Design the format of the exercise.

- A seminar: an informal discussion-based exercise led by a presenter or facilitator, used to teach or orient participants.
- A workshop: A formal discussion-based exercise led by a facilitator or presenter, used to build or achieve a product.
- A tabletop exercise: This type involves senior staff, elected or appointed officials, or other key personnel in an informal group discussion centered on a hypothetical scenario.
- A game: A simulation of operations using rules, data, and procedures designed to depict an actual or assumed real-life situation.
- A drill: A supervised activity that tests a specific operation or function of a single agency.
- A functional exercise: A single or multi-agency activity designed to evaluate capabilities and multiple functions using simulated response.
- A full-scale exercise: A high-stress multi-agency, multijurisdictional activity involving actual deployment of resources in a coordinated response, as if a real incident had occurred.
## RESOURCES

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<td>Sub-Area Super.</td>
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## Appendix A5: Agency Contact Sheet Template

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<td>ESF-1 Coordinator</td>
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**Interstate**

**State A**

- DOT
- Other organization as appropriate

**State B**

- DOT
- Other organization as appropriate

[continue list as necessary]

**State**

- State Homeland Security Agency
- State Emergency Management Agency
- State Senior Security Advisor

**DOT’s Partner Agencies at the State Level**

- Agency 1 (enter title)
- Agency 2 (enter title)
- Agency 3 (enter title)

[continue list as necessary]

- Turnpike Authority
- State Police/Highway Patrol
- Law Enforcement
- National Guard
- Health Agency

[continue list as necessary]

**Local**

- County/Parish A
- Sheriff’s Office
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Appendix A5 Summary of the Full after Action Report Template

EXECUTIVE SUMMARY

The [STATE NAME/JURISDICTION] – [EXERCISE TYPE – seminar, table top, etc.] was conducted on [DATE OF EXERCISE].

EXPLAIN THE SEQUENCE OF EVENTS

LIST KEY STRENGTHS IDENTIFIED
Key strengths identified during this exercise include:

LIST SUCCESSES RECOGNIZED
In addition, several successes of this exercise can be recognized, among them:

LIST IMPROVEMENT AREAS
Throughout the exercise, several opportunities for improvement were identified, including:

PART 1: EXERCISE OVERVIEW

EXERCISE NAME:
[EXERCISE JURISDICTION/STATE - EXERCISE NAME - EXERCISE TYPE]

LOCATION:
[EXERCISE FACILITY - EXERCISE JURISDICTION - EXERCISE STATE]

SCENARIO:
List all scenarios.

TYPE OF EXERCISE:

FOCUS:

EXERCISE DATE:

PARTICIPATING ORGANIZATIONS:

CO-SPONSORS:
State Agencies:

Federal Agencies:

Contract Support:
[(EXERCISE SUPPORT TEAM)]

PARTICIPANTS:
Local Participants:

State Participants:

Federal Participants:

Private Sector Participants:

International Participants:

Local Participants:
Provincial/State Participants:

NUMBER OF PARTICIPANTS:
Participants: [#]
Observers: [#]
Facilitators: [#]
Exercise Support: [#]

FUNDING SOURCE:

PROGRAM:

CLASSIFICATION:
(If applicable)

FEDERAL SPONSORING AGENCY/DEPARTMENT POC:
(If applicable)

FEDERAL EXERCISE PROJECT OFFICER:
(If applicable)

EXERCISE OVERVIEW:
EXERCISE STATE

EXERCISE CITY

EXERCISE NAME AND TYPE

EXERCISE DATE

EXERCISE EVALUATION

PART 2: EXERCISE GOALS AND OBJECTIVES

PART 3: EXERCISE SYNOPSIS

SCENARIO:

EXERCISE:

PARTICIPANT HOTWASH SUMMARY:

PART 4: ANALYSIS OF MISSION OUTCOMES
This section of the report provides an analysis of how well the participating jurisdictions as a whole (e.g., across disciplines and across jurisdictions) achieved the expected mission outcomes in responding to the simulated event, with a focus on outcomes, rather than processes.

MISSION AREA
Outcome Summary

MISSION AREA
Outcome Summary

MISSION AREA
Outcome Summary
PART 5: ANALYSIS OF CRITICAL TASK PERFORMANCE

TITLE OF TASK
Task # – Subtask #
Discussion
Recommendations and Improvements
Actions
Task # – Subtask #
Discussion
Recommendations and Improvements
Actions

PART 6: CONCLUSIONS

EXERCISE JURISDICTION/STATE – EXERCISE TYPE – EXPLAIN THE SIGNIFICANCE OF THE EXERCISE

LIST CAPABILITIES
Exercise Participants demonstrated an initial capability to:

LIST RECOMMENDATIONS
Exercise Participants identified several lessons learned for improvements in [EXERCISE JURISDICTION/STATE – EXERCISE TYPE]. Major recommendations include:

SUMMARY
Appendix A6: Collaboration and Coordination Guides

Key Steps to Effective Collaboration

A shared and compelling transportation need transcends jurisdictional boundaries and can best be addressed through regional collaboration. The following steps can aid planners in identifying and responding to transportation emergency management needs.

Step 1. Describe the geographic area in the region: populations; geography, transportation resources and assets; hazards and potential significant events; and communication assets and needs.

Step 2. Identify the common issues or needs that are perceived to be mutual problems and opportunities in planning for disasters, emergencies, and significant events, such as:
- Information sharing
- Compatible technologies systems
- Movement of people and goods
- Safety
- Response to incidents, manmade and natural
- Homeland security programs, including evacuation
- Transport of hazardous materials
- Economic
- Recovery and restoration of normal operations
- Leverage multiple funding sources
- Resource sharing across agencies and jurisdictions

Step 3. Identify existing networks or groups within the region that are engaged in transportation planning, such as state departments of transportation, metropolitan planning organizations and regional planning commissions; transportation management centers; United We Ride; direct service providers who provide or use paratransit. Identify agencies and stakeholders involved in emergency planning, such as emergency managers. Identify stakeholders who may not currently be involved in emergency planning, but who need to be, such as businesses, utilities, and representatives of community groups who may require transportation services.

Step 4. Use existing address books or contact lists to identify potential collaborators.

Step 5. Call or email key contacts to schedule a meeting or ask to be invited to a meeting with these agencies and others that are engaged in emergency management planning.

Think about the key message before the call. What is the purpose of creating or joining a collaborative network? What are the benefits?

Use hazard vulnerability assessments in emergency operation plans (EOPs) as conversation starters.

Step 6. Secure support from the leadership of these organizations.

Questions for Collaborative Partners/Other Stakeholders to Ask Each Other

To develop a comprehensive plan built on the principles in this Guide, planners and all vested stakeholder organizations must ask and be prepared to answer these key questions. These questions are designed to act as conversation starters that will lead to other questions that draw out information about specific details that apply to each region.

1. What disasters, emergencies, and significant events do you plan for?
2. What low probability events should be planned for that are not currently considered?
3. How well prepared are you for disasters and emergencies?
4. How do you view your role in these atypical emergency events?
   a. What are your responsibilities?
   b. What are your priorities?
   c. How are the roles and responsibilities incorporated into your regional planning?
   d. What capabilities and resources can you provide?
   e. What transportation infrastructure/services do you need access to? Do you have a priority list?
   f. How can you better integrate security, emergency management and mitigation planning into your regular practices?
5. Where do you fit into your regional planning efforts?
6. Who are the key people you need to talk to?
7. What is the best way to communicate and share information with each other
   Before
   During
   After an atypical event?
9. What is the chain of authority if/when a particular decision-maker is unavailable?
10. What is your restoration process? How are locations prioritized for restoration?
11. How can other regional stakeholders and the public participate and contribute to the planning?
12. What long term-goals and objectives that address disasters, emergencies, and significant events can be accomplished through our regional collaboration?

Appendix B: Case Studies
Tennessee DOT Case Study: Emergency Preparedness, Exercise Planning, and Federal Reimbursement Program Practices

This case study describes the Tennessee DOT (TDOT) emergency management roles and responsibilities, emergency management plan, and the Comprehensive Exercise Program (CEP). In addition, it provides a background of TDOT’s training and exercise program, an overview of TDOT’s practices related to its bridge monitoring tool, and process milestone tracking.

State Background
Tennessee’s land area totals 41,235 square miles which accommodates a population of over 6.6 million and a population density of 153.9 persons per square mile according to the U.S. Census. Tennessee is bordered by eight states.

TDOT is responsible for 14,510 miles of Tennessee’s 87,259 total roadway miles. The interstate system comprises about one percent of the 14,510 miles but serves a quarter of the state’s traffic. TDOT is also involved in various ways in multimodal transportation systems offered by the state including three public ferries, four public ports, six commercial airports, 76 general aviation airports, 24 transit systems, 2,100 Class I rail line miles, 850 short-line rail miles, 1,180 yard line and industrial sidings miles, and 8,500 bicycle highway lane miles.

The state of Tennessee frequently experiences a number of weather-related hazards: flooding, tornadoes, and winter storms. Earthquakes in the New Madrid Seismic Zone (NMSZ) are a natural hazard for the western portion of the state.

State Transportation Agency Emergency Management Responsibilities
TDOT is considered an equal partner by the Tennessee emergency management community and has extensive experience responding to a wide range of emergencies and disasters. In fact, TDOT was the first state DOT to develop a Continuity of Operations Plan (COOP). In incidents, TDOT has typically assumed the following roles: Incident Command, Operations, Planning, and Intel/Investigations.

The TDOT Basic Emergency Operations Plan (BEOP) is the foundation of TDOT’s all-hazards emergency management actions and is implemented by TDOT’s Commissioner of Transportation in case of state or national emergency. While TDOT is primarily responsible for the state-owned highway system, TDOT’s BEOP states that “TDOT has an overarching responsibility to keep the entire integrated transportation system functional during a disaster.” Hence, continuous planning and coordination with the multimodal owners and operators is required.

Within the state, the State Emergency Operations Center (SEOC) coordinates emergency operations. TDOT’s Emergency Services Coordinator (ESC) represents the DOT within the SEOC and ensures that it fulfills its Emergency Support Function (ESF) roles and functions. When an emergency or incident occurs, TEMA receives reconnaissance reports and then contacts TDOT ESC. TDOT ESC contacts TDOT Regional Emergency Service Liaison (ESL) who will take appropriate action. The action is input into the SWIFT system, and the Regional ESL reports back to the TDOT ESC regarding the response. The TMC responds to both TEMA and ESC.

TDOT has lead or supporting role in 12 ESFs: ESF-1 Transportation, ESF-2 Communications, ESF-3 Infrastructure, ESF-5 Information and Planning, ESF-7 Resource Support, ESF-9 Search and Rescue, ESF-10 Environmental Response, ESF-12 Energy, ESF-13 Law Enforcement, ESF-14 Donations/Volunteers,
ESF-15 Recovery, and ESF-16 Animal Care and Disease Management. TDOT is the lead for ESF 1: Transportation and for ESF 3 sub-functions ESF 3: Infrastructure – Route Clearance & Bridge Inspection and ESF 3: Infrastructure – Debris Removal.

The following are some of the TDOT key roles and responsibilities during emergencies and disasters:

- **TDOT Emergency Services Coordinator (ESC).** The ESC acts on behalf of TDOT to implement state emergency services requirements (TCA 58-2-108), ensures that TDOT carries out its emergency functions, and represents TDOT in the SEOC. The ESC coordinates response and requests for resources and facilities. The ESC also coordinates disaster preparedness training.

- **TDOT Regional Emergency Services Liaison (ESL).** ESLs coordinate emergency response by working with ESCs, TEMA regional personnel and local response agencies in their regions. During an activation of TEMA’s one of three Regional Coordination Centers, the regional ESL represents TDOT. Upon being notified of an incident by a TDOT ESC, the Regional ESL then contacts Regional Operations forces, HELP units, the Federal Highway Works Administration, or the Regional Director. The ESL is expected to keep the ESC apprised of the situation.

- **TDOT Office of Emergency Operations.** Develops and maintains all TDOT emergency plans with the exception of the Highway Incident Management Plan.

- **TDOT Regional Offices.** Provide Emergency Service Liaison (ESLs) to TEMA. Perform emergency repair and engineering functions. Provide damage assessment teams. Provide incident scene clearance and make signage. Provide debris removal services. Provide vehicles, radios, and other equipment.

- **TDOT Central Services Division.** Issue over-dimensional/overweight permits. Assist with emergency purchases and procurement. Assist in tracking and mobilization.

- **TDOT Construction.** Provide administrative oversight for emergency construction and contracting including use of Emergency Contracting Authority.

- **TDOT Finance.** Create and maintain documentation of emergency expenditures. Provide payroll functions. Pay bills.

- **TDOT Maintenance.** Provide Emergency Service Coordinators (ESCs) to State EOC. Provide emergency contracts.

- **TDOT Structures.** Provide support to state bridge repair crews and inspectors. Provide emergency design of culverts, retaining walls, and small drainage structures. Provide structural engineering assistance to local governments.

- **TDOT Traffic Operations.** Provide coordination with Regional Traffic Management Centers (TMCs) and Regional Incident Management Coordinators. Establish policy and standards for traffic management. Develops and maintains the Highway Incident Management Plan. Provide and maintain wireless/radio communications network.

- For additional Division responsibilities, see Table 1. TDOT Essential Functions By Division (Prioritized) (2015 TDOT COOP, pages 57-58)

The specific responsibilities of TDOT for disasters are noted in the 2015 Disaster Operations Guide:

**TDOT’s ESF #1 responsibilities:**

- Ensuring major routes and alternatives are open and available for use by incoming personnel, equipment and supplies.
• Ensuring traffic control devices are in place and easily understood by emergency responders moving into an area, diverting unauthorized civilian traffic from the disaster areas, and assisting victims who are voluntarily leaving the disaster areas. This includes coordinating activities with ESF 13 Law Enforcement to provide staffed roadblocks and other control posts.
• Ensuring route conditions allow for the movement of any vehicles authorized to use a particular route.
• When safe to do so, waiving restrictions concerning weight, height, and width of vehicles, as well as provisions concerning the hauling of hazardous materials, explosives, and other sensitive materials needed in the affected areas on a case by case basis.
• Coordinating the use of vehicles carrying personnel and/or equipment to ensure maximum efficiency is utilized (i.e., vehicles are fully loaded, etc., to prevent duplication of effort, unnecessary trips, etc.)

TDOT’s ESF #3 responsibilities are the Route Clearance and Bridge Inspection Sub-function and Debris Removal Sub-function. The former provides the capability of determining route conditions, and removal of debris from roadways and airfields to open them up for use by responding personnel; and, provides debris removal from major roadways after roadways have been opened and from other areas as determined by the state EOC. The latter provides coordination of removal of debris generated through the demolition of unsafe structures, recovery activities, or through the disaster itself. (TDOT 2015 Disaster Operational Guide)

Summary of Tennessee DOT’s Emergency Preparedness Plan
The TDOT emergency management planning process involves the following six key steps:

1. Research
2. Review
3. Development
4. CEO Briefing
5. Validation
6. Maintenance

TDOT developed the Transportation Emergency Preparedness Plan (TEPP) to direct the DOT’s actions to address any type of emergency, disaster, or hazard. The TEPP complements the Tennessee Emergency Management Plan (TEMP) and delineates the roles and responsibilities of TDOT for emergency preparedness, response, and recovery with respect to the state, TDOT, and the Tennessee transportation infrastructure system. The plans included in the TEPP were developed around State and Federal guidelines and the Emergency Management Accreditation Program standards.

The stated purpose of the TEPP is “to enhance the emergency response capabilities and other emergency actions of the Tennessee Department of Transportation to ensure continuity of Department operations and functionality of the State's integrated transportation system.”

The key components of the TEPP are:

• Hazard Analysis – The Hazard Analysis, based on the Tennessee State Hazard Analysis, provides a focus for TDOT’s emergency planning.
Basic Emergency Operations Plan (BEOP) - The BEOP, the TDOT's emergency operations framework, includes a description of the emergency operations organization, assigned responsibilities and the direction and control mechanisms.

Continuity of Operations Plan (COOP) – The COOP helps ensure continuity of essential services following a catastrophic disaster or during an infectious disease pandemic. The COOP contains an emergency workforce management plan and pandemic disease plan.

Disaster Operational Guidelines (DOG) – The DOG outlines how TDOT will meet assigned responsibilities for each Emergency Support Function in the TEMP.

Catastrophic Action Plan (CAT) - CAT provides TDOT with planning and management guidance for catastrophic disaster response and recovery missions. CAT annexes include guidance for specific missions (e.g., Dam Failure Response, Debris Management, Winter Storm Response, Agriculture Emergency Response).

Emergency Communications Plan (EmComm) – EmComm describes the communications systems, resources, and capabilities for daily and emergency operations for both internal and external communications.

The TEPP has been informed by the following State Authorities and federal and state references:

Authorities
- TCA 58-2-101 through 58-2-124, as amended
- TCA 68-212-201 through 68-212-207, Hazardous Waste Management
- Governor’s Executive Order No. 7, State Emergency Response Council
- Governor’s Executive Order No. 15, ESC program
- Governor’s Executive Order No. 23, National Incident Management System
- Governor’s Executive Order No. 49, Interoperable Communications 

References
- TEMA BEOP Guidance Document TN 500-1, as amended.
- Tennessee Multi-Jurisdictional Radiological Emergency Response Plans for Watts Bar and Sequoyah Nuclear Plants, as amended.

TDOT Emergency Management Practices and Technologies Deployed

Training and Exercises
The Tennessee Emergency Management Plan Paragraph VII.F.2.b.5 states that, “Each state agency that has an emergency-oriented mission...will conduct training essential to implementation of assigned functions.”
The TDOT two-year exercise program is built into the emergency management program. The program requires, for each identified hazard, an exercise be conducted at least once in the two-year cycle. The Emergency Management Standards are used as promulgated by the Emergency Management Accreditation Program; HSEEP is used as a reference but not as a standard. TDOT frequently trains and exercises with, and communicates and coordinates with the state EMA and other state emergency response providers. In fact, TDOT has an arrangement with the Tennessee Emergency Management Agency (TEMA) to “exchange” training in which training delivered by TEMA is complimentary to TDOT personnel and vice versa. Interdisciplinary training with the Civil Air Patrol is organized at least once yearly.

TDOT’s emergency management training plan includes the following training identified through a training needs assessment:

- NIMS/ICS training; required courses vary based on worker function
- ICS Train-the-Trainer Course
- TIM training for all responders
- Protect the Queue training for all field employees
- Hazardous Materials Awareness training for all field employees
- Hazardous Materials for Operational Level Response
- Active Shooter Training for all employees
- TVA Fixed Nuclear Facilities Emergency Worker Training
- Oak Ridge Emergency Worker Training
- Storm Spotter Training
- Emergency Radio Communications Training
- Emergency Management Support Team Training
- Damage Assessment Workshop
- Basic Public Information
- TEMA 101
- Instructor Methodology
- Principles of Emergency Management
- Exercise Development
- Communications Leader Course
- Search and Navigation Courses
  - TEMA Search Operations
  - GPS Land Navigation Course
  - Basic Visual Tracking
  - Managing Search Operations
- National Domestic Preparedness Consortium (NDPC) - DHS-funded courses
- FEMA National Emergency Training Center

NIMS/ICS training and TIM training have already been provided to all emergency response personnel in the TDOT.

Cross-Training

TDOT’s cross-training strategy seeks to address events that may result in a large absenteeism rate. TDOT procedure is to cross-train four to five additional persons to perform a particular function that has been
designated as an "Essential Function" of the DOT. Essential Functions are defined in the TDOT COOP. The training need depends on the gap between the number of people that already have the capacity to perform the function and the number that is required. The actual amount of training required depends on function and system complexity.

**Tennessee Traffic Incident Management (TIM) Training Facility**

TDOT and the Tennessee Department of Safety and Homeland Security, in October, 2014, opened a training facility dedicated to traffic incident management training. The facility offers realistic sections of an interstate-like roadway with a two-way interchange and varying numbers of lanes, a section of a two-lane highway, and a four-way intersection. The facility allows the simulation of various crashes to train emergency responders on major highway incident response.

**Fixed Nuclear Facility Program**

Tennessee has two nuclear power plants. TEMA is responsible for off-site emergency response in the event of a radiological incident at either of the plants. TEMA’s Technical Hazards Branch provides multiple training and training exercises on an annual basis to federal, state, and local responders.

Offsite response is described in the Tennessee Multi-Jurisdictional Radiological Emergency Response Plan (MJREP) while individual plans provide details of response for each of the two nuclear power stations. The individual plans are exercised on an annual basis; a federal exercise is also conducted by FEMA and the Nuclear Regulatory Commission yearly at one of the two plants.

The Sequoyah MJREP and the Watts Bar MJREP address the technical aspects of radiological response, while the TEMP addresses overall command and control. The area around the nuclear power plant is grouped into two zones, the Emergency Planning Zone which extends 10 miles from the plant and the Ingestion Pathway Zone which extends 50 miles from the plant.

**Comprehensive Exercise Program**

The Comprehensive Exercise Program (CEP) for the State of Tennessee Department of Transportation is a supporting document to the TEPP and is an agency-wide comprehensive emergency management exercise program plan and framework for TDOT. The document states that the "goal of the CEP is to develop, implement and institutionalize a quality comprehensive, objective based and threat focused exercise program." (p. 4, CEP) More specifically, the program purposes are "a) To exercise emergency responses to all possible and the more likely probably threats to Tennessee, such as tornados, flood, winter weather, drought, fire, earthquake, and hazardous materials accidents. b) To establish a corrective action program that will identify shortfalls in policies, personnel or equipment that may prevent effective or efficient response to emergency or disaster situations." (p. 23, CEP)

The document supports the State Multi-year Training and Exercise Plan / Program (TEP) and is intended to fulfill federal HSEEP requirements; at the same time, it should be noted that the State of Tennessee incorporates the HSEEP process into the planning methodology but not as regulation. In addition to the HSEEP, the Emergency Management Accreditation Program (EMAP) and Emergency Management Performance Grant (EMPG) documentation are also used as guidelines by TEMA and TDOT.

Standard components to be included in exercise plans along with exercise scheduling and priority determination are described in the CEP. Tennessee’s Multiyear Exercise Plan includes a listing of exercise priorities for each. The current exercise priorities for 2015, 2016, and 2017 are shown below:
Training Year 2015 (October 2014 – September 2015)
Exercise Priority
1. Transportation accident (Hazmat)
2. Terrorism
3. Tornado Outbreak
4. Communications
5. Winter Weather
6. Energy failure
7. Hazardous Materials

2. Training Year 2016 (October 2015 – September 2016)
Exercise Priority
1. Severe Weather / Flood
2. Geological Hazard
3. Dam or Levee failure
4. Transportation (non Hazmat)
5. Terrorism
6. Communications
7. Hazardous Materials

3. Training Year 2017 (October 2016 – September 2017)
Exercise Priority
1. Earthquake
2. Dam or Levee Failure
3. Communications
4. Continuity of Operations
5. Energy Failure
6. Severe Weather / Winter Storm / Tornado Outbreak
7. Hazardous Materials

(TDOT Appendix 2, 2012 CEP)

Under state law, TDOT must exercise each hazard once every two years. Because regions require HQ support to develop and implement exercises, TDOT HQ coordinates them on their behalf. Tabletop exercises for winter weather response are delivered every December. Participants include TDOT, FEMA, and Highway Patrol. Region 3 participates in joint exercises with Civil Air Patrol on a regular basis. Since Tennessee experiences weather-related hazards during the March-May period, TDOT does not conduct exercises during this period.

After every exercise or real-world event, AARs are developed to capture lessons learned, identify areas of needed improvement, and assign the improvements to a functional area within the TDOT.

**Bridge Monitoring Tool**
TDOT’s bridge monitoring tool was implemented in 2004 to help TDOT prioritize and schedule disaster assessments for TDOT’s bridges. TDOT’s bridges and their conditions are included in the TDOT bridge monitoring tool. When an event occurs and certain thresholds are exceeded, the tool alerts TDOT emergency personnel and assists in providing situational awareness and geospatial information. To prioritize assessments, the tool uses information about drainage areas, foundations, and other information to analyze the impact of specific events on each bridge.
There are currently 19,838 bridges in Tennessee, of which 17,154 are over water and 723 are scour critical. There are also 891 unknown foundation bridges - 85% of these are locally owned. TDOT has about 17 bridge disaster assessment teams across its four regions; the teams are led by a bridge engineer. Within 24 hours of a flood, a regional bridge inspection unit is dispatched to inspect the bridge per TDOT’s emergency plan. For significant events such as an earthquake event larger than a 5.5, all bridge inspection crews are dispatched to the affected region and performs evaluations according to priority established in the Department’s Earthquake Annex. Bridge inspection units upload the status of the bridges after flood events so notes can be entered into the system and the event alert terminated. Prior to reopening, bridges closed due to flood events must have TDOT region bridge inspection approval.

The internet-based tool is customizable with TDOT TRIMS data and monitors bridges on a 24/7 basis using NOAA and USGS information for dangerous conditions within the state. The TRIMS database contains FHWA required bridge data along with additional data (foundation types, substructures, paint system) which can help determine pre-disaster conditions. The tool can use the information to predict the consequences of particular events. The current default thresholds are 25-year rainfall events for scour critical and unknown foundations. Some are also set to NEXRAD radar and USGS stream gages.

Once the trigger level is reached (e.g. rainfall of x inches) the tool will send out alerts via email, fax, and/or cell phone text for specific bridges that are in danger of incurring damages. LPAs can enroll in this system. Information and photos from disaster assessments can be uploaded in PDF format to the tool. Laptops are provided to the disaster assessment teams so that they are able to upload the information from the field.

The May, 2010 flood caused significant damages to TDOT’s bridges. While 89% of the highway bridges had no significant damages, at least 1,167 structures were damaged and needed repairs. 44 of the 52 Counties had bridges that suffered maintenance issues because of the flood. The tool alerted TDOT personnel regarding damaged bridges and helped in tracking and disseminating bridge condition information to relevant personnel. The usefulness of this tool and bridge database was fully demonstrated during this May, 2010 flood event.

**Process Milestone Tracking**

Tracking milestones, as noted in the NCHRP Synthesis 472, can assist state DOTs in ensuring that the key requirements of the FHWA ER program are being met. Tracking individual projects in the FHWA ER program is also important.

TDOT uses FHWA ER process tracking tables with key milestones to monitor and track each FHWA ER milestone (see Table 1). These tables show the required actions for the FHWA ER program. A detailed FHWA ER project tracking spreadsheet helps manage individual projects (see Table 2).
Table 1. TDOT FHWA ER Process Tracking Table

Using Excel to track key process milestones for active FHWA ER events

<table>
<thead>
<tr>
<th>ER Event No.</th>
<th>Date</th>
<th>Counties/Areas</th>
<th>ER Event Description</th>
<th>Green</th>
<th>Yellow</th>
<th>%</th>
<th>Blue</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER-TN09-1</td>
<td>January 28, 2009</td>
<td>Lake, Obion</td>
<td>Ice storm</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>ER-NC10-1</td>
<td>October 25, 2009</td>
<td>North Carolina</td>
<td>I-40 rockslide detour and traffic operations</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>ER-TN10-1</td>
<td>November 10, 2009</td>
<td>Polk</td>
<td>US-64 rockslide 1</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>ER-TN10-2</td>
<td>January 19, 2010</td>
<td>Polk</td>
<td>US-64 rockslide 2</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>ER-TN10-3</td>
<td>January 25, 2010</td>
<td>Sevier</td>
<td>US-411/321 rockslide</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>ER-TN10-4</td>
<td>March 14, 2010</td>
<td>Blount</td>
<td>US-129 rockslide</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>ER-TN10-5</td>
<td>April 30 - May 2, 2010</td>
<td>West and Middle Tenn.</td>
<td>Flooding</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>ER-TN11-1</td>
<td>February 20, 2011</td>
<td>Grundy</td>
<td>SR-108 rockslide</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>ER-TN11-2</td>
<td>April 5, 2011</td>
<td>Sevier</td>
<td>US-411/321 slide</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>ER-TN11-3</td>
<td>April 19, 2011</td>
<td>West Tenn.</td>
<td>Storms and flooding</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>ER-TN11-4</td>
<td>April 25-28, 2011</td>
<td>East Tenn.</td>
<td>Storms and tornado</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>ER-TN12-1</td>
<td>January 31, 2012</td>
<td>Cocke</td>
<td>I-40 rockslide</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>ER-TN12-2</td>
<td>March 8, 2012</td>
<td>Campbell</td>
<td>I-75 landslide</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>ER-TN12-3</td>
<td>March 16, 2012</td>
<td>Blount</td>
<td>US-129 rockslide</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>ER-TN13-1</td>
<td>January 15, 2013</td>
<td>East Tenn.</td>
<td>Storms and flooding</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>ER-TN13-2</td>
<td>May 9, 2013</td>
<td>Smith</td>
<td>SR-25 slide</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
</tbody>
</table>

Green = complete; yellow = in progress; % = partially funded; blue = not started.
Source: TDOT.
Regional Incident Management Plans

Interstate Incident Management Plans were developed for each TDOT region and its Maintenance and Incident Management offices in particular. The Plans provide action plans and pre-established sections and detours. The stated goals of the Plan include:

- "Decrease response time for Department staff to respond to interstate closures
- Detail work zone traffic control so that Maintenance staff know what measures to put in place to maintain staff and public safety
- Have well-planned detour and/or alternate routes with appropriate signing where feasible
- Keep motorists moving safely to their destinations and/or places of rest"

The Plan builds upon an earlier project that divided the interstate into color-coded Incident Management Zones and identified corresponding color-coded detour routes. The Plan includes maps of the Interstate sections and corresponding contacts of TDOT, local emergency responders, local law enforcement, and state highway patrol. District personnel from each of the districts in the regions are expected to be thoroughly familiar with the latest version of the Plan.

To this end, Work Zone Traffic Control training is being implemented for maintenance workers by the regions. The training enhances understanding of the standards and specifications for deployment of traffic control along with measures to ensure employee safety.
The Interstate Incident Management Plans for each TDOT region will be updated as needed and can be accessed via the following link: https://www.tn.gov/tdot/article/interstate-incident-management-plan#sthash.tlzdM9uN.dpuf

Conclusions and Lessons Learned

Information regarding TDOT’s emergency preparedness plan, emergency training and comprehensive exercise plan and their key components will be useful for state DOTs seeking to improve their emergency preparedness plans and exercise plans. The topics and templates contained in the components of the TEPP and the CEP may assist state DOTs develop their own emergency plans.

Templates and the suite of plans offered through the DHS National Planners Course can be helpful in creating emergency management plans. In addition, the state EMA can provide a wealth of knowledge and expertise in plan development, and in training and exercise development and implementation.

Remember that plans can be written on three levels:
  • Agency level – which results in the Strategic Plan
  • Regional level - which results in the Operational Plan
  • District level – which results in the Tactical Plan

Resilience has been mentioned in transportation legislation, but has been part of TDOT activities and operations for many years since TDOT is one of six pay as you go agencies. While resilience efforts have saved TDOT millions of dollars, they are difficult to itemize because there are so many measures that have become a part of daily operations. The state develops a Mitigation plan to which TDOT provides input in the form of priority projects.

Results of exercise, testing, and drills are considered measures of success. The results highlight strengths and weaknesses of the agency’s emergency management program. A lesson learned, however, is a misnomer because lessons cannot be learned unless the results are documented and corrective actions are tracked to implementation.

Information regarding the bridge monitoring tool and the process tracking milestones may help other state DOTs in the reimbursement processes by aligning their practices with the requirements of the federal FHWA Emergency Relief and FEMA Public Assistance programs.
Iowa DOT Case Study: FHWA ER and FEMA PA Reimbursement Programs

A summary of Iowa DOT’s emergency management roles and responsibilities and overview of practices related to the FHWA ER and FEMA PA reimbursement programs are provided in this Case Study. Three technologies used by Iowa DOT for emergency management and FHWA ER and FEMA PA programs are highlighted:

- Iowa DOT’s real-time weather and operations information that has improved safety for Iowa DOT personnel and the public;
- Resource Management System modules created for the FHWA ER and FEMA PA programs that have allowed Iowa DOT to identify and process billings in an efficient and timely manner, and have made it cost effective for the DOT to recover costs from small disasters;
- Electronic Detailed Damage Inspection Reports (DDIRs) that have significantly decreased the DDIR processing time, time needed for revisions and for distributing them.

State Background

Iowa Department of Transportation (IADOT) has, under its purview, 9,000 miles of highways that are in the Federal and State Highway System. There are 24,000 bridges, approximately 4,100 are part of the Primary Highway System. IADOT has about 3,000 personnel and is comprised of six districts. IADOT’s Transportation Systems Management and Operation Office oversee management of the emergency transportation operations response efforts on behalf of the DOT.

State Transportation Agency’s Emergency Management Responsibilities

Iowa’s Emergency Response Plan requires Iowa DOT, upon a Governor’s Proclamation of Disaster Emergency, to be prepared to deploy resources and provide requested personnel to staff the Emergency Operations Center, and provide requested equipment.

Iowa DOT has a Stewardship Agreement with the FHWA to administer the FHWA ER Program. Also, all Iowa DOT’s roadways are Federal-aid routes and have been eligible for FHWA ER funding. Post MAP-21, some debris removal is no longer eligible under the FHWA ER but eligible under the FEMA PA program and federal share has now decreased to 75%.

Iowa DOT, lead for Transportation (ESF-1), is responsible for:

- Restoring and maintaining the primary road systems needed for the support of response activities during and immediately following an emergency or disaster.
- Restoring and maintaining other public transportation systems needed for the support of response activities during and immediately following an emergency or disaster.
- When necessary, assisting with the restoration and maintenance of non-public transportation systems, such as railroad and aviation, needed for the support of response activities during and immediately following an emergency or disaster.
- Coordinating requests for transportation system repair and restoration assistance from local emergency response organizations, local government agencies, and state agencies.
- Whenever practical, meeting the minimum transportation needs of the general public in emergency/disaster affected areas.
- Gathering data for emergency response and for general public use about the effects of an emergency/disaster on transportation systems and associated infrastructure.
• Tracking transportation system restoration activities on a statewide basis.
• Restricting the use of transportation systems and associated infrastructure by the general public to facilitate emergency response activities and/or address public safety concerns.”

(Iowa Emergency Response Plan, 2010)

Iowa DOT is the co-lead for Public Works and Engineering (ESF-3) which is organized into six sub functions. Iowa DOT is the sub function lead for Debris Removal, co-lead for evacuation, and co-lead for Engineering and Technical Services.

Iowa DOT has designated reimbursement coordinators for both the FHWA ER and FEMA PA programs within its Central Office as well as in its district offices. Iowa DOT provides FHWA ER and FEMA PA program and disaster assessment training to its personnel and LPAs using scenarios from previous disasters. In addition, Iowa DOT provides FHWA ER training to state EMA staff to support their effort in helping LPAs with the FHWA ER reimbursement process. Iowa DOT employees are also trained for integration with the state EMA disaster assessment teams and state EMA project officer or project coordinator roles.

**IADOT Emergency Management Practices and Technologies Deployed**

To facilitate cost recovery, Iowa DOT uses the following accounting and financial management practices: internal audits, FHWA FMIS, unique project codes, uniform invoice system for counties, automatic screening of duplicate costs, and statewide integrated financial, HR, and payroll system.

To facilitate documentation and information management, Iowa DOT uses electronic storage, central drive/location for storage, and electronic signatures.

With respect to site assessments, Iowa DOT uses weather information system, geospatial information, historic data mapping to show repetitive losses, a bridge/highway/pavement management system, and distributes information packets to assessment teams.

With respect to asset management, Iowa DOT equips snowplows with GPS and uses a bridge monitoring system to assess and predict the impact of damages. Iowa DOT contracts out most emergency work and has emergency waivers for permits and the like. To address Appeals issues, Iowa DOT holds discussions with its FHWA Division Office.

Iowa DOT staff training addresses reimbursement programs, disaster assessment, and emergency management roles and responsibilities including FEMA PA roles. Iowa DOT also provides training to the state EMA and LPAs.

**Technology: Real-Time Weather And Operations Information**

Iowa DOT’s “Weatherview” website provides real-time road weather information to the public and current and potentially dangerous weather forecasts to help disaster assessment teams determine site safety. The Weatherview, developed in 2009, has continually been updated. It now includes access to road cameras, traffic flow information, and email and mobile-text alerts triggered by weather events. The site can be accessed via: [http://weatherview.iowadot.gov](http://weatherview.iowadot.gov)

A screenshot of the system is shown in Figure 1:
The Weatherview system includes a map displaying weather information (air temperature, road and bridge temperatures, wind speed and direction, wind gusts, dew point, and visibility) from Road Weather Information System (RWIS) stations and Automated Weather Observation Systems (AWOS). Additional features of the system include the following:

- Site-specific forecasts and historical weather information
- Camera image gallery
- Rural traffic speed information

Weatherview shows current RWIS/AWOS information as well as forecasts. Weatherview has been “trimmed down” over the years with some functionality split off in new systems Skyhawk and Trackaplow. Weatherview continues to function as a portal for real time and forecast road weather information.

WOPR/Skyhawk replaced Weatherview’s functionality regarding crew deployment. WOPR was our internal AVL system that showed current truck location/info/imagery and could run historical reports. WOPR was replaced by Skyhawk a few years ago, so perhaps for the purpose of this report you can focus just on our current system, Skyhawk.

Trackaplow is a public website showing current plow information and dash cam imagery.
Trackaplow and Skyhawk offer lots of detail regarding current truck locations and what they are doing. Very importantly, Skyhawk also has the ability to summarize fleet usage or create historical reports regarding a truck’s whereabouts which can be used in conjunction with RMS for disaster record keeping. This information allows Iowa DOT to determine the daily equipment and labor usage during storms.

**Technology: Resource Management System (RMS)**

During a disaster the Iowa DOT maintenance garages track labor, equipment, materials and expenses using project numbers and functions. The maintenance garages also track location of work using the RMS system. Modules for FHWA ER program and FEMA PA program created within the system uses the appropriate schedules and rates for each program. These modules enable Iowa DOT accounting staff to identify costs and associate them to specific FEMA Project Worksheets (PWs) or FHWA DDIRs within the system. The information can be exported from RMS into an excel worksheet in the format needed for the FEMA PA or the FHWA ER program. This system prevents billing duplications and has decreased audit issues, both at a state and federal level. The number of administration staff needed to identify costs and create reports has decreased by more than half. Also, small disasters with relatively small recoverable costs were previously not billed because the amount of the administration hours needed to identify disaster costs outweighed the recovered costs.

This system has allowed Iowa DOT the ability to identify and process billings for small disasters in just a few hours for the FEMA PA program. The system allows the Iowa DOT to recover more disaster costs in a more efficient and timely manner.

**Technology: Electronic DDIRs**

Increases in cost reimbursement opportunities led Iowa DOT to identify better methods of tracking costs and processing necessary paper work for both the FHWA ER and FEMA PA programs. In the extensive flooding event in 2008, hundreds of DDIRs had to be processed, and project tracking and storage was done manually. Each project required a DDIR with a map and attachments be submitted. The users had to type, print and scan the document or complete the DDIR by hand, scan and email. Only about 15 DDIRs were being processed daily. Changes to the DDIRs were time-consuming, and email size restrictions forced a DDIR to be submitted in several separate emails.

Based on these and other issues, an After Action Report recommended the creation of an electronic form. The new form took about 1.5 years to complete at a cost of about $85,000-$100,000. The new system included a mapping system that automatically creates a map with Lat/Long or County/Route/Milepost, the automatic conversion of attachments into a PDF file, and the use of electronic signatures. The new form was expandable to incorporate additional lines and revisions could easily be made. The system sends automatic notifications to all relevant offices (i.e., Accounting, Central Office). A central database linked with all other systems and databases is used to store and track all project-related information. The DDIR system was first used for the 2011 flooding event (the event is described in detail in the case study contained in NCHRP Synthesis 454). The system greatly decreased the number of hours needed to develop, process and approve the DDIR, and enhanced the efficiency and effectiveness of the communication process. The DDIR forms are now being completed in the field using laptops; in the future, they will likely be available via tablets and smart phones. These efficiencies allowed projects to be started sooner and important reimbursement program deadlines to be met.

Iowa DOT achieved a 90% time reduction in DDIR completion.
Louisiana Department of Transportation and Development (DOTD) Case Study: Asset Documentation and Tracking, Procedures for Emergency Transportation

This Case Study covers three key lessons to be learned from the Louisiana DOTD related to 1) pre-disaster, pre-event inspection and documentation of transportation asset conditions; 2) asset tracking of transportation resources from mobilization through demobilization, including leased, contracted and agreement-based coaches, vans, and schoolbuses; and 3) explicit plans and procedures for emergency transportation for people with access and functional needs. DOTD transportation assets and tracking practices support the local evacuation practices throughout the state.

State Background
Louisiana Department of Transportation and Development (DOTD) has, under its purview, 16,000 miles of highways that are in the Federal and State Highway System, approximately 8,000 bridge structures, and 120 movable bridges. DOTD has about 4,000 personnel and is comprised of nine districts.

DOTD’s Emergency Management Responsibilities, Practices and Plans

Under the 2009 State Emergency Operations Plan, DOTD is assigned as the lead agency for Emergency Support Function (ESF)-1 Transportation and Emergency Support Function (ESF)-3 Public Works and Engineering. ESF-1 involves the coordination of all modes of emergency transportation. Transportation in emergencies consists of the movement of people, household pets, and critical supplies. ESF-3 involves the pre-staging of assets in preparation for contra-flow, damage assessment of state owned roads and facilities, and debris clearance and removal off of roadways and bridges. ESF-3 responsibilities also include the coordination of the maintenance and repair of state flood control works, emergency ice and snow removal, and the coordination of the evaluation and repair of coastal and watershed erosion. In addition, DOTD also provides support to other ESF’s depending on the nature of the emergency and the type of support required.

DOTD has a Stewardship agreement with FHWA to administer the FHWA ER program. DOTD has three FTEs dedicated to reimbursements. During emergencies, DOTD works with other emergency response agencies and with neighboring states.

The state emergency management agency (EMA) is LA Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) and is the FEMA grantee. GOHSEP receives and processes the damage assessment reports, and delivers the reimbursement funds to DOTD.

DOTD Emergency Management Practices and Technologies Deployed

Thorough Pre-Disaster Documentation

The DOTD ESF-1 pre-event procedures involve ten pre-mobilization steps. The tenth is particularly instructive as exemplary pre-disaster documentation:

"10. Records the actions during the pre-mobilization for cost accountability, resource utilization, and future corrective actions. More specifically, Incident Command Structure (ICS) series forms
and an operational log at the EOC are utilized. State and agency forms and records are completed to capture the details of what actions were taken and what resources were used."

Even during this pre-event stage, DOTD prepares itself to manage resources and monitor them. A pre-event inspection of damages and/or deficiencies to vehicles and equipment is conducted particularly for reimbursement purposes.

**Comprehensive Transportation Asset Tracking**

Mobilization occurs when the Unified Command orders a statewide activation and instructs DOTD to activate contracts and MOUs. They include a Coach Bus contract, an Interagency Support Agreement (ISA) with the Department of Education, vehicle staging area MOUs.

During the mobilization phase, transportation personnel, resources and equipment are moved to selected locations. Districts are responsible for staffing the locations and providing logistical and administrative support and support staff to coordinate resource procurement. Resource tracking is important during the mobilization process to ensure that adequate transportation resources are provided at each location. The districts establish ESF-1 Operations and are responsible for documenting the movement of services, personnel, equipment, and other resources including the resources departing from and arriving to staging areas.

DOTD has recently refined its asset tracking procedures to its ESF-1 and ESF-3 Operations Plan for emergencies by incorporating lessons learned from Isaac. Assets that require tracking include vehicles that are organic to DOTD and vehicles owned by other agencies and organizations used by DOTD for evacuation purposes. *Commercial coach buses and commercial vans provided through an existing contract, and school buses from the Department of Education are the most often used transportation assets.* (emphasis added.)

Asset Tracking is important in maintaining situational awareness during disasters and for documentation of resources utilized for reimbursement purposes. DOTD’s Asset Tracking activities include:

- Maintaining real time information on the operational status of any asset being used during an event.
- Identifying transportation assets used or controlled by DOTD.
- Directing the use of transportation assets used or controlled by DOTD.
- Recording the use of transportation assets used or controlled by DOTD.
- Reporting the use of transportation assets used or controlled by DOTD.

Asset Tracking assists DOTD in being financially responsible by controlling asset costs and facilitating the reimbursement process. It also helps provide the basis for key decisions and priority of asset use.

**Recording Procedures and Forms**

DOTD District personnel record information regarding resources on the appropriate forms (per the ESF implementing procedures) and report it as soon as possible to the ESF-1 or ESF-3 branch within the EOC. The information is then entered into the WebEOC which makes it accessible from any location in the field. The information includes assignment rosters, asset tracking information, and task orders along with activation time. Copies of activated service contracts are forwarded to the Reimbursement and Recovery team.

**Technologies Enabling Asset Tracking**
For the ESF-1 requirements DOTD uses a GPS tracking system (web-based) provided by the vendor to locate assets in real-time as well as recording and reporting on the use of the assets. DOTD also provides navigational devices to provide the operators of transportation assets the most direct route to and from locations. ESF-3 uses navigational devices as well for the damage assessment teams. The GPS systems are used by other DOTD staff elements at various locations to report on the use of DOTD controlled assets.

Evacuation to Accommodate Persons with Access and Functional Needs
Commercial coach buses and commercial vans provided through an existing contract and school buses from the Department of Education are the transportation assets most often used by DOTD. In large part, this is because Louisiana has taken to heart the lessons of Hurricane Katrina, and plans and implements emergency transportation services for the whole community, including people with access and functional needs. This includes people with disabilities as well as children, elderly people, and poor people who may require transportation services in an emergency.

Local jurisdictions typically have primary responsibility for response, with the state supporting when local sources are overwhelmed or request assistance. Subsequent to Hurricane Katrina, the City of New Orleans, in cooperation with the New Orleans Regional Transit Authority (NORTA), GOHSEP and DOTD, developed a City Assisted Evacuation Plan (CAEP) to facilitate the timely evacuation of people with access and functional needs. The CAEP is a program designed to help people who have no means of evacuating on their own in the event of a mandatory evacuation.

During an evacuation, NORTA puts all available vehicles, drivers and other resources into use in order to help the City with its evacuation plan. “We use our buses to transport people from designated pick-up points around the City to the Union Passenger Terminal/Amtrak Station (UPT). From the UPT, residents are then taken out of town on other transportation arranged by the City of New Orleans.” (NORTA, 2016). That transportation out of town is coordinated with DOTD.

The CAEP was activated for Hurricane Gustav, and proved to be largely effective. With very minor modifications, the example timetable for the plan was included in NCHRP Report 740, A Transportation Guide for All-Hazards Emergency Evacuation, as Tool 4.1.2: Public Assisted Evacuation Plan (PAEP) Example Timeline for Notice Events, one of many tools to assist transportation agencies and regions in evacuation planning.
TOOL 4.1.2: PUBLIC ASSISTED EVACUATION PLAN (PAEP) TIMELINE FOR NOTICE EVENTS

PURPOSE:
This tool provides a timeline for a PAEP, which should be helpful for planning and responding to an evacuation for a notice event, especially hurricanes and possibly wildfires and tsunamis. It sets forth key phases and milestones for evacuation response that should be planned for ahead of time. See Figure 4-9. Phases include the Leaning Forward Phase, the Make Ready Phase, the Execute PAEP Phase, the Wind Down PAEP Phase, and the Transition to Response Phase.

DIRECTIONS:
This timeline should be used as a starting point for local, regional, and state planning efforts for determining the timeline for a notice evacuation event, particularly hurricanes and possibly wildfires and tsunamis. However, for wildfires and tsunamis, the notice might be much shorter, thus there would be less time to respond before the event. Plans across governments and agencies should consider various actions during each of these phases and work together to ensure adequate collaboration, and refine the timeline estimates for their particular region and event. Moreover, plans from various agencies and across multiple jurisdictions should come to agreement on and adhere to the timeline and to the operational strategies that accompany it.

Caltrans Case Study: Training and Emergency Management Technology

A summary of Caltrans emergency management related training and exercises along with an overview of the technologies utilized for emergency response and recovery are provided in this Case Study.

State Background
California's state DOT Caltrans, with 12 district offices and 22,000 employees, is one of the largest in the United States. Caltrans has an in-house Maintenance Training Academy in Sacramento with 9 or 10 full-time trainers and support personnel to train its 6,000 maintenance personnel and new hires. The Academy, established in 1979, also brings in trainers and other staff from district offices for various classes. At times the Academy staff will travel to the district offices to provide training. Caltrans also uses California Specialized Training Institute (CSTI) for some of its training needs. CSTI is a part of CalOES and supports emergency management, public safety, homeland security, hazardous materials, disaster recovery and crisis communication training, exercises, and education. In addition, Caltrans participates in multiple yearly training exercises sponsored by CalEMA and other agencies. California Governor's Office of Emergency Services (CalOES) certifies all Caltrans' emergency management related plans. Caltrans receives technical assistance from contractors and FEMA and CalOES on Emergency Management and plan development. Caltrans refers to all relevant NCHRP and TRB documents during the plan development process.

Caltrans' natural hazards priorities have been and continue to be fire, flood, and earthquakes. Winter operations are now becoming a priority for Caltrans as well. With regards to manmade threats, Active Shooter has become a priority in recent years, particularly after the Active Shooter incident in San Bernardino and shooting incidents at Caltrans. In one recent event, a Caltrans employee killed his supervisor and then himself after being reprimanded.

Caltrans Training and Exercise Program
Caltrans' MultiYear TEP includes multiple training workshops and courses, drills, and exercises delivered by Caltrans as well as training and interagency exercises and training delivered by CalOES, CSTI, and the Earthquake Country Alliance.

Caltrans’ MultiYear Training and Exercise Plan (2013-2017)

- Four All-Hazards Training Caltrans Workshop (one per quarter)
- Three CCOP/COG Caltrans Workshop
- Monthly NIMS/SEMS/ICS and First Observer Caltrans Training
- Monthly Caltrans Headquarters and Alternate EOC Readiness Exercise
- Monthly Caltrans Sat Com Auxiliary Radio Systems Statewide Drill
- Monthly Caltrans Microwave Telephone and Fixed Satellite Telephone Drill
- Monthly Caltrans HazMat First Responder Operational and Awareness Training
- Monthly Caltrans New Employee Maintenance and Operations (NEMO) and Introduction to NIMS/SEMS/ICS Training
- One Caltrans Beginning Blasters Training
- One Caltrans Blasters Refresher – Rock and Stump Training
- One Caltrans Blasters Refresher – Avalanche Control Training
- One Caltrans Avalanche Training
- Eight California Specialized Training Institute (CSTI) HazMat Technician / Specialist Training
- Four CalEMA Safety Assessment Program Evaluator Training for Caltrans Personnel
• One CalEMA Disaster Mortuary Operational Response Team (D-MORT) Training
• Participation in the statewide Great California Shakeout Interagency Exercise organized by the Earthquake Country Alliance
• Participation in...
  o Annual CalEMA Golden Guardian Initial Planning Conference (7 months prior)
  o Annual CalEMA Golden Guardian Midlevel Conference (3 months prior)
  o Annual CalEMA Golden Guardian Executive Table Top Exercise (TTX) (1 month prior)
  o Annual CalEMA Golden Guardian Exercise
  o Annual CalEMA Golden Guardian Hot Wash / After Action Report (2 months later)

Note that the initial planning conference is held seven months prior to the actual Exercise.

California Specialized Training Institute (CSTI) is a part of CalOES and supports emergency management, public safety, homeland security, hazardous materials, disaster recovery and crisis communication training, exercises, and education.

Training

Caltrans provides classroom training including monthly NIMS/SEMS/ICS and First Observer training at its Maintenance Training Academy to new and existing maintenance personnel. More specifically, Caltrans requires ICS (IS-100) for all new field personnel, along with training on the Standardized Emergency Management System (SEMS) for California. NIMS, SEMS and ICS are included in the 2-week training provided to new maintenance employees. SEMS is similar to NIMS/ICS and includes key components of NIMS and ICS. CalOES provides California-specific NIMS guidance and manuals. Note that California complies with NIMS through a self-certification process.

Cognizant of the fact that interactive field training would improve preparedness of field personnel, Caltrans sponsored development of ICS field training through the NCHRP Project 20-59(30) and pilot tested it.

In addition to Introduction to ICS (IS-100), new field personnel are required to take the following training:

• Maintenance Employee Safety Orientation
• Standard First Aid
• CPR Refresher
• Protection of Workers
• Defensive Drivers Training
• Heat Stress
• Sexual Harrassment Prevention (Rank & File)
• Hazardous Substance First Responder Awareness Level
• HazMat Communications Program
• Hearing Protection Program
• Temporary Traffic Control
• Storm Water Management
• New Maintenance Employee
• NIMS Compliance for Field Friday
• Vendor Workplace Safety and Personal Responsibility
• Diversity Awareness Training-Rank & File
Caltrans uses workshops to deliver all-hazards training and COOP/COG training: each year, Caltrans holds four All-Hazards Training Workshops (one per quarter) and three COOP/COG Workshops.

With respect to safety training, Caltrans safety officers provide safety and hazards training including hazmat communications, confined spaces, standard emergency management, hazardous waste generation, emergency responder awareness, emergency responder operations (for supervisors), and management for hazmat specialists. Bridge crews receive specialized week-long bridge crew training at the Academy. Drills and the train-the-trainer method are used to train field personnel on equipment. As personnel undergo training, they will be evaluated. If the trainer determines that the trainee cannot use the equipment, they will not continue with the training – the trainee will need to take additional training before receiving the hands-on training.

**Exercises**

Exercises are important to Caltrans so that weaknesses can be identified. Some of the weaknesses are caused by a high level of employee turnover. The focus of exercise scenarios has been on local hazards such as fire, flood, and earthquakes. Currently, Caltrans is participating in the Cascadia Rising exercise focused on a Cascadia Subduction Zone event in Redding, California. Caltrans selects exercise types appropriate for the exercise objectives. For instance, TTXs are used for management purposes and development of plans and procedures. Caltrans participates in the annual CalOES Golden Guardian Executive Table Top Exercise (TTX) which is held one month prior to the actual CalOES Golden Guardian FSE. In addition, Caltrans incorporates its communications technologies and systems into its FSEs.

Caltrans holds drills to evaluate personnel, technologies, and equipment; and for the development of plans and procedures. Caltrans' personnel undergo monthly drills to ensure that they can mobilize the technologies and equipment; during the drills, any issues with the systems will be flagged as well. Monthly drills are held on Caltrans Microwave Telephone and Fixed Satellite Telephone and Sat Com Auxilliary Radio Systems which is a satellite communications system owned, managed, and operated by Caltrans for the purpose of emergency communications within Caltrans and with other agencies.

**Caltrans Emergency Management Technologies**

Caltrans uses many technologies for emergency response and recovery. In addition to technologies used in daily incident management, Caltrans has emergency communications essential for large-scale disasters and complex events in which normal channels of communications are disrupted. Caltrans also uses an emergency mapping system to assist its personnel in gaining situational awareness during emergencies. Caltrans' FireCast, FloodCast and ShakeCast systems correspond to Caltrans' priority hazards – Fire, Floods, and Earthquake; these systems assist Caltrans in damage assessment immediately after an event. In addition, Caltrans has a tsunami warning system.

With respect to EOCs, because TMCs have substantial ITS technologies to assist with day-to-day traffic incidents, most Caltrans EOCs are co-located with TMCs. However, in case a TMC becomes inaccessible, Caltrans has developed contingency locations for EOCs and Incident Command Centers. Caltrans also has trailers and tents that allow Caltrans to establish their communications systems in emergency events.

**Satellite Communications**

Caltrans has two Mobile Emergency Operations Centers (MEOCs) with CT SAT COM technology, one in Northern California and one in Southern California. MEOC trailers provide important communications services and support to an Incident Command or Unified Command Post. CT SAT COM is a satellite communications system owned, managed, and operated by Caltrans for the purpose of emergency
communications within Caltrans and with other agencies. Various new technologies are periodically added to the MEOCs. As implementation occurs, appropriate training is delivered to emergency personnel. When Caltrans organizes or participates in full-scale exercises, the CT SAT COM system and/or the MEOCs are incorporated into the exercises and evaluated through After Action Reports.

**Emergency Management Common Operational Picture (EMCOP)**

EMCOP is a web-based emergency management mapping application allowing Caltrans personnel to view data from multiple sources during an emergency. EMCOP assists emergency personnel achieve situational awareness by allowing them to access:

**Caltrans Data**
- Assets such as maintenance facilities and telecommunications towers.
- State and local bridge locations.
- Quickmap of lane closures, chain controls, highway cameras, and California highway patrol incidents.
- California highway map.

**External Data**
- Flood warnings
- NOAA storm reports
- Flood stream gauges
- National Weather Stations
- Flood hazard areas
- Fire information
- Shakemap
- Natural hazards
- Real-time weather information

EMCOP is GIS-based and its functionality includes ability to query the system, bookmark map locations, easily create maps and export as image files, point and click layer information, overlay various data layers, street view, identification of assets with buffer zones, and printing capability.
Background
Regional coordination and planning is essential for effective regional emergency management. MPOs, Regional Councils of Government, and Rural Planning Organizations (RPO), and other regional entities serve an important role as conveners of meetings around highway, transit, safety, and (sometimes) security projects.

Federal law [Title 23 United States Code section 134] defines a MPO as a forum for cooperative transportation decision-making. An MPO serves an urbanized area over 50,000 in population, but a single MPO may serve more than one urbanized area.

They are responsible for the regional transportation planning processes, including long-range planning (Long Range Transportation Plan), short range planning (Transportation Improvement Program or TIP), and an annual program of work (Unified Planning Work Program or UPWP). Many MPOs address regional coordination for programs, such as emergency planning, housing, health, and other regional services.

Among the key regional transportation planning entities in California are eighteen MPOs. Every county in California with at least one urbanized area is served by an MPO. MPOs are generally known in California as councils of government or associations of government.

MPOs are not identified as a support agency under Emergency Support Function #1 (Transportation), but can assist with or provide a forum for emergency preparedness and response. As noted in the California Metropolitan Planning Organization Regional Transportation Plan (RTP) Guidelines:

"Although the immediate organizational response to security incidents and disasters will be the responsibility of law enforcement/safety agencies, there is an important role that MPOs can play in promoting coordinated planning among first responders and transit agencies in anticipation of unexpected events or natural disasters. In addition, MPOs could also provide a centralized location of information on transportation system conditions and the responses that might be useful in an emergency."

The Guidelines also stipulate that transportation security (including emergency preparedness) is an element that should be incorporated into the RTP.

Not all MPOs recognize their role as a leader or coordinator of emergency planning. Fewer still have taken on a more active role in coordinating regional emergency response. Because every MPO is different, there are many approaches to emergency management. Some MPOs may focus on limited aspects of emergency preparedness. For example, the Alpine County Local Transportation Commission (ACLTC), a Regional Transportation Planning Agency (RTPA) in California focuses on evacuation planning in its 2015 RTP. Others, especially larger MPOs, may take on more extensive emergency planning and coordination roles such as the Metropolitan Transportation Commission described in the following section.

Metropolitan Transportation Commission’s Regional Transportation Emergency Management Program
The Metropolitan Transportation Commission (MTC) is the MPO responsible for the nine county San Francisco Bay Area region, a region with 7 million people and 101 cities. The Bay Area transportation network consists of 20+ transit agencies and Caltrans, and is responsible for 7,000 mi. of transit routes, 20,000 miles of arterial roads, and 1,400 miles of highway.

MTC works with the transportation agencies and other regional agencies to:

- Assist in the development of regional transportation emergency plans;
- Facilitate annual emergency preparedness exercises to test disaster plans;
- Coordinate emergency response by working with transportation agencies and other regional agencies.

A number of regional emergency plans have been developed including a Transportation Response Plan, a Regional Transportation Emergency Management Plan, a Regional Emergency Coordination Plan Transportation Annex, a Bay Area Catastrophic Earthquake Plan and a Bay Area Large Special Events Plan.

Region-wide exercise plans have been conducted to exercise existing plans, identify weaknesses in current processes and to build relationships between regional agencies and emergency responders.

One critical role MTC plays in emergency management is in facilitating the information flow to and from regional transportation agencies to both the state/federal emergency management agencies (California Office of Emergency Services and FEMA) and to the public.
Serving as a transportation information clearinghouse, MTC disseminates consolidated information to the CalOES and federal agencies in a regional summary report and distributes public information through established networks. The information is gathered via a daily information collection and sharing call led by the MTC during emergency events. Types of information collected include critical status updates, impacts on region, resource requests and other essential data such as GIS.
## Appendix C. Acronyms, Abbreviations, & Initialisms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>4-Cs</td>
<td>Of TIM: communication, cooperation, coordination, and consensus (in some places, commitment replaces consensus. Also, sometimes referred to as only three, omitting the last C, and some have even suggested five, adding compromise)</td>
</tr>
<tr>
<td>9/11</td>
<td>September 11, 2001</td>
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<tr>
<td>24/7</td>
<td>Continuous 24 hours per day, 7 days per week operation of some function, such as a TMC, generally for 365 days per year unless otherwise specified; non-full-time operations may be expressed similarly, such as 16/5 for weekday prime travel period</td>
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<tr>
<td>A-CERT</td>
<td>Airport Community Emergency Response Team</td>
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<td>AAR</td>
<td>After-Action Report</td>
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<tr>
<td>APWA</td>
<td>American Public Works Association</td>
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<tr>
<td>ATIS</td>
<td>Advanced Traveler Information Systems</td>
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<tr>
<td>AVL</td>
<td>Automated Vehicle Location</td>
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<tr>
<td>BYOD</td>
<td>Bring Your Own Device</td>
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<tr>
<td>CAD</td>
<td>Computer-Aided Dispatch</td>
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<tr>
<td>Caltrans</td>
<td>California Department of Transportation</td>
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<tr>
<td>CAP</td>
<td>Corrective Action Plan</td>
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<tr>
<td>CAPTA</td>
<td>Costing Asset Protection (An All Hazards Guide for) Transportation Agencies</td>
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<tr>
<td>CAPTool</td>
<td>CAPTA (software) Tool</td>
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<tr>
<td>CBO</td>
<td>Community Based Organization</td>
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<tr>
<td>CBRNE</td>
<td>Chemical, Biological, Radiological, Nuclear, and Explosive (threats)</td>
</tr>
<tr>
<td>CEMP</td>
<td>Comprehensive Emergency Management Plan (another name used for EOP)</td>
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<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
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<tr>
<td>CERT</td>
<td>Community Emergency Response Team</td>
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<tr>
<td>CERT</td>
<td>Computer Emergency Readiness Team</td>
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<tr>
<td>CERT</td>
<td>Cyber Emergency Response Team</td>
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<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>CI/KR</td>
<td>Critical Infrastructure and Key Resources</td>
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<tr>
<td>COG</td>
<td>Continuity of Government</td>
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<tr>
<td>ConOps</td>
<td>Concept of Operation</td>
</tr>
<tr>
<td>COOP</td>
<td>Continuity of Operations Plan</td>
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<tr>
<td>CPG</td>
<td>Comprehensive Preparedness Guide</td>
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<tr>
<td>CRS</td>
<td>Congressional Research Service</td>
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<tr>
<td>CSF</td>
<td>Cybersecurity Framework</td>
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<td>CSRC</td>
<td>Computer Security Resource Center (of NIST)</td>
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<tr>
<td>CTST</td>
<td>Community/Corridor Traffic Safety Teams</td>
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<tr>
<td>DCS</td>
<td>Distributed Control Systems</td>
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<tr>
<td>DEM</td>
<td>Department of Emergency Management</td>
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<tr>
<td>DEP</td>
<td>Department of Environmental Protection</td>
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<tr>
<td>DIETT</td>
<td>Disruption Impact Estimating Tool—Transportation</td>
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<tr>
<td>DLE</td>
<td>Department of Law Enforcement</td>
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<tr>
<td>DOD</td>
<td>Department of Defense (U.S.)</td>
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<td>DOI</td>
<td>Department of the Interior</td>
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<tr>
<td>DOT</td>
<td>Department of Transportation</td>
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<tr>
<td>DMS</td>
<td>Dynamic (also called Changeable or Variable) Message Sign</td>
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<tr>
<td>DVRPC</td>
<td>Delaware Valley Regional Planning Commission</td>
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<tr>
<td>EAS</td>
<td>Emergency Advisory System</td>
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<tr>
<td>ECC</td>
<td>Emergency Communications Centers, also called Public Safety Answering Points (PSAP)</td>
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<tr>
<td>EDO</td>
<td>Emergency Duty Officer</td>
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<tr>
<td>EEG</td>
<td>Exercise Evaluation Guide</td>
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<td>EM</td>
<td>Emergency Management</td>
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<tr>
<td>EMA</td>
<td>Emergency Management Agency</td>
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<tr>
<td>EMAC</td>
<td>Emergency Management Assistance Compact</td>
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<td>EMAP</td>
<td>Emergency Management Accreditation Program</td>
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<td>EMI</td>
<td>Emergency Management Institute (of FEMA)</td>
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<tr>
<td>EMPG</td>
<td>Emergency Management Performance Grant (Program)</td>
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</tbody>
</table>
EMPP   Emergency Management Professional Program
EMS    Emergency Medical Services
EOC    Emergency Operations Center (may be state [SEOC] or regional/local [LEOC])
EOP    Emergency Operations Plan
EPA    Environmental Protection Agency (U.S. and state)
EPC    Emergency Planning Coordinator
EPZ    Emergency Planning Zone
ER     Emergency Response
ESF    Emergency Support Function
ETO    Emergency Transportation Operations
FAH    Federal Aid Highway
FAST Act Fixing America’s Surface Transportation Act
FBO    Faith-based Organization
FBI    Federal Bureau of Investigation
FC     Fusion Center
FDOT   Florida Department of Transportation
FE     Functional Exercise
FEMA   Federal Emergency Management Agency (of DHS)
FIA    Federal Insurance Administration
FOG    Field Operations Guide
FSE    Full-Scale Exercise
GAO    Government Accountability Office
GDE    Governor-Declared Emergency
HAR    Highway Advisory Radio
HAZMAT Hazardous Materials
HEIED  Hand-Emplaced Improvised Explosive Device
HS     Homeland Security
HSAS   Homeland Security Advisory System
HSEEP  Homeland Security Exercise and Evaluation Program
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
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</thead>
<tbody>
<tr>
<td>HSOC</td>
<td>Homeland Security Operations Center</td>
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<tr>
<td>HSPD</td>
<td>Homeland Security Presidential Directive</td>
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<tr>
<td>IAP</td>
<td>Incident Action Plan</td>
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<tr>
<td>IC3</td>
<td>Internet Crime Complaint Center</td>
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<tr>
<td>(I)CP</td>
<td>(Incident) Command Post</td>
</tr>
<tr>
<td>IC(S)</td>
<td>Incident Command(er) (System)</td>
</tr>
<tr>
<td>ICS-CERT</td>
<td>Industrial Control Systems Cyber Emergency Response Team</td>
</tr>
<tr>
<td>ID</td>
<td>Identification (card or other)</td>
</tr>
<tr>
<td>IGEMS</td>
<td>Interior Geospatial Emergency Management System</td>
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<tr>
<td>IP</td>
<td>Improvement Plan</td>
</tr>
<tr>
<td>IRGC</td>
<td>International Risk Governance Council</td>
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<tr>
<td>IRP</td>
<td>Incident Response Patrol</td>
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<tr>
<td>ISAC</td>
<td>Information Sharing and Analysis Center</td>
</tr>
<tr>
<td>I-STEP</td>
<td>Intermodal Security Training and Exercise Program</td>
</tr>
<tr>
<td>ITS</td>
<td>Intelligent Transportation Systems</td>
</tr>
<tr>
<td>JFO</td>
<td>Joint Field Office</td>
</tr>
<tr>
<td>JIC</td>
<td>Joint Information Center</td>
</tr>
<tr>
<td>JIS</td>
<td>Joint Information System</td>
</tr>
<tr>
<td>LEOP</td>
<td>Local Emergency Operations Plan (county, region, etc.)</td>
</tr>
<tr>
<td>LEPC</td>
<td>Local Emergency Planning Committee</td>
</tr>
<tr>
<td>LLIS</td>
<td>Lessons Learned Information Sharing (DHS Web site)</td>
</tr>
<tr>
<td>LIDAR</td>
<td>Light Detection and Ranging</td>
</tr>
<tr>
<td>LRFD</td>
<td>Load and Resistance Factor Design</td>
</tr>
<tr>
<td>LTAP</td>
<td>Local Technical Assistance Program</td>
</tr>
<tr>
<td>M&amp;O</td>
<td>Management and Operations (in this context, Operations and Maintenance are both included in the 'O' here)</td>
</tr>
<tr>
<td>MAC(S)</td>
<td>Multiagency Coordination (System) (of NIMS)</td>
</tr>
<tr>
<td>MAP-21</td>
<td>Moving Ahead for Progress in the 21st Century (Act)</td>
</tr>
<tr>
<td>MBTA</td>
<td>Massachusetts Bay Transportation Authority</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>MCEER</td>
<td>Multidisciplinary Center for Earthquake Engineering Research</td>
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<tr>
<td>MOA</td>
<td>Memorandum of Agreement</td>
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<tr>
<td>MOT</td>
<td>Maintenance of Traffic</td>
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<tr>
<td>MOU/A</td>
<td>Memorandum of Understanding/Agreement</td>
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<tr>
<td>MPO</td>
<td>Metropolitan Planning Organization</td>
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<tr>
<td>MSEL</td>
<td>Master Scenario Events List</td>
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<tr>
<td>MUTCD</td>
<td>Manual on Uniform Traffic Control Devices</td>
</tr>
<tr>
<td>NADO</td>
<td>National Association of Development Organizations</td>
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<tr>
<td>NAS</td>
<td>National Academy of Sciences</td>
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<tr>
<td>NCCoE</td>
<td>National Cybersecurity Center of Excellence</td>
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<tr>
<td>NDRF</td>
<td>National Disaster Recovery Framework</td>
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<tr>
<td>NEMA</td>
<td>National Emergency Management Association</td>
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<tr>
<td>NEP</td>
<td>National Exercise Program</td>
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<tr>
<td>NFIP</td>
<td>National Flood Insurance Program</td>
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<tr>
<td>NFPA</td>
<td>National Fire Protection Association</td>
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<tr>
<td>NGO</td>
<td>Nongovernmental Organization</td>
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<tr>
<td>NHI</td>
<td>National Highway Institute (of FHWA)</td>
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<tr>
<td>NHTSA</td>
<td>National Highway Traffic Safety Administration</td>
</tr>
<tr>
<td>NIAC</td>
<td>National Infrastructure Advisory Council</td>
</tr>
<tr>
<td>NIC</td>
<td>National Integration Center (the Incident Management Systems Integration Division of FEMA)</td>
</tr>
<tr>
<td>NIMS</td>
<td>National Incident Management System</td>
</tr>
<tr>
<td>NIMSCAST</td>
<td>NIMS Capability Assessment Support Tool</td>
</tr>
<tr>
<td>NIPP</td>
<td>National Infrastructure Protection Plan</td>
</tr>
<tr>
<td>NIST</td>
<td>National Institute of Standards and Technology</td>
</tr>
<tr>
<td>NMF</td>
<td>National Mitigation Framework</td>
</tr>
<tr>
<td>NOAA</td>
<td>National Oceanic and Atmospheric Administration</td>
</tr>
<tr>
<td>NOC</td>
<td>National Operations Center (of the U.S. Department of Justice)</td>
</tr>
<tr>
<td>NOCoE</td>
<td>National Operations Center of Excellence</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>NOFO</td>
<td>Notice of Funding Opportunity</td>
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<tr>
<td>NPG</td>
<td>National Preparedness Goal, or National Preparedness Guidelines</td>
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<tr>
<td>NPS</td>
<td>National Preparedness System</td>
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<tr>
<td>NPS</td>
<td>National Planning Scenarios</td>
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<tr>
<td>NRF</td>
<td>National Response Framework</td>
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<tr>
<td>NRP</td>
<td>National Response Plan (replaced by the NRF)</td>
</tr>
<tr>
<td>NTAS</td>
<td>National Terrorism Advisory System</td>
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<tr>
<td>NTIMC</td>
<td>National Traffic Incident Management Coalition</td>
</tr>
<tr>
<td>NUG</td>
<td>National Unified Goal (for Traffic Incident Management)</td>
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<tr>
<td>NVD</td>
<td>National Vulnerability Database</td>
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<tr>
<td>NWS</td>
<td>National Weather Service</td>
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<tr>
<td>NYSDOT</td>
<td>New York State Department of Transportation</td>
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<tr>
<td>O&amp;M</td>
<td>Operations and Maintenance</td>
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<tr>
<td>OSHA</td>
<td>Occupational Safety and Health Administration</td>
</tr>
<tr>
<td>OSSPAC</td>
<td>Oregon Seismic Safety Policy Advisory Commission</td>
</tr>
<tr>
<td>PIARC</td>
<td>Permanent International Association of Road Congresses (World Road Association)</td>
</tr>
<tr>
<td>PIO</td>
<td>Public Information Officer</td>
</tr>
<tr>
<td>PLC</td>
<td>Programmable Logic Controllers</td>
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<tr>
<td>PPD</td>
<td>Presidential Policy Directive</td>
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<tr>
<td>PPE</td>
<td>Personal Protective Equipment</td>
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<tr>
<td>PSAP</td>
<td>Public Safety Answering Point, also called Emergency Communication Center (ECC)</td>
</tr>
<tr>
<td>PSE</td>
<td>Planning for Special Events, or Planned Special Events</td>
</tr>
<tr>
<td>QC</td>
<td>Quick Clearance</td>
</tr>
<tr>
<td>RRCC</td>
<td>Regional Response Coordinating Center</td>
</tr>
<tr>
<td>S&amp;L</td>
<td>State and Local (governments)</td>
</tr>
<tr>
<td>SAFECOM</td>
<td>Safe Communications (DHS program)</td>
</tr>
<tr>
<td>SARS</td>
<td>Severe Acute Respiratory Syndrome</td>
</tr>
<tr>
<td>SCADA</td>
<td>Supervisory Control and Data Acquisition</td>
</tr>
<tr>
<td>SCIP</td>
<td>Statewide Communications Interoperability Planning (DHS methodology)</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>SCOTSEM</td>
<td>Special Committee on Transportation Security and Emergency Management (of AASHTO)</td>
</tr>
<tr>
<td>SEMA</td>
<td>State Emergency Management Agency</td>
</tr>
<tr>
<td>SEOP</td>
<td>State(wide) Emergency Operations Plan</td>
</tr>
<tr>
<td>SHRP II</td>
<td>Strategic Highway Research Program, second generation</td>
</tr>
<tr>
<td>SMART</td>
<td>Specific, Measurable, Achievable, Relevant, Time-bound</td>
</tr>
<tr>
<td>SOG</td>
<td>Standard Operating Guidelines</td>
</tr>
<tr>
<td>SOP</td>
<td>Standard Operating Procedure</td>
</tr>
<tr>
<td>SSOM</td>
<td>Subcommittee on Systems Operations and Management (of AASHTO)</td>
</tr>
<tr>
<td>SSP</td>
<td>Sector-Specific Plan or Safety Service Patrol</td>
</tr>
<tr>
<td>STIX</td>
<td>Southern Traffic Incident eXchange</td>
</tr>
<tr>
<td>TCC</td>
<td>Traffic Control Center</td>
</tr>
<tr>
<td>TCL</td>
<td>Target Capabilities List</td>
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<tr>
<td>TCP</td>
<td>Traffic Control Point</td>
</tr>
<tr>
<td>TEP</td>
<td>Training and Exercise Plan</td>
</tr>
<tr>
<td>TEPW</td>
<td>Training and Exercise Planning Workshop</td>
</tr>
<tr>
<td>TERA</td>
<td>Transportation / Transit Emergency Response Application</td>
</tr>
<tr>
<td>TERET</td>
<td>Transportation Emergency Response Effects Tracking</td>
</tr>
<tr>
<td>THIRA</td>
<td>Threat and Hazard Identification and Risk Assessment</td>
</tr>
<tr>
<td>TIM</td>
<td>Traffic Incident Management</td>
</tr>
<tr>
<td>TMC</td>
<td>Transportation (or Traffic) Management Center</td>
</tr>
<tr>
<td>TOPPLEF</td>
<td>Training, Organizations, Plans, People, Leadership and Management, Equipment, and Facilities</td>
</tr>
<tr>
<td>TRANSCOM</td>
<td>Transportation Operations Coordinating Committee</td>
</tr>
<tr>
<td>TRR</td>
<td>Transportation Research Record</td>
</tr>
<tr>
<td>TSGP</td>
<td>Transit Security Grant Program</td>
</tr>
<tr>
<td>TSM&amp;O</td>
<td>Transportation System Management &amp; Operations</td>
</tr>
<tr>
<td>TTAP</td>
<td>Tribal Technical Assistance Program</td>
</tr>
<tr>
<td>TTC</td>
<td>Temporary Traffic Control</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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<td>-----------------------------------------------------------------------------</td>
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<tr>
<td>TTX</td>
<td>Tabletop Exercise</td>
</tr>
<tr>
<td>TWIC</td>
<td>Transportation Workers Identification Credential</td>
</tr>
<tr>
<td>TxDOT</td>
<td>Texas Department of Transportation</td>
</tr>
<tr>
<td>USA PATRIOT</td>
<td>Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism</td>
</tr>
<tr>
<td>UC</td>
<td>Unified Command</td>
</tr>
<tr>
<td>URL</td>
<td>Universal (or Uniform) Resource Locator (Web site address)</td>
</tr>
<tr>
<td>US-CERT</td>
<td>US Computer Emergency Readiness Team</td>
</tr>
<tr>
<td>USACE</td>
<td>U.S. Army Corps of Engineers</td>
</tr>
<tr>
<td>USCG</td>
<td>U.S. Coast Guard (of DHS)</td>
</tr>
<tr>
<td>USFA</td>
<td>US Fire Administration (of FEMA)</td>
</tr>
<tr>
<td>USGS</td>
<td>U.S. Geological Service</td>
</tr>
<tr>
<td>USM</td>
<td>U.S. Military (multiple branches)</td>
</tr>
<tr>
<td>UTL</td>
<td>Universal Task List</td>
</tr>
<tr>
<td>UVC</td>
<td>Uniform Vehicle Code</td>
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<tr>
<td>VTrans</td>
<td>Vermont Agency of Transportation</td>
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<tr>
<td>WMD</td>
<td>Weapons of Mass Destruction</td>
</tr>
</tbody>
</table>
Appendix D: Glossary

**Active Aggressor**
an individual actively engaged in killing or attempting to kill people in a confined and populated area, typically (though not necessarily) through the use of firearms. (Modified from *Active Shooter Events from 2000 to 2012*, 2014) This term includes individuals using firearms, but is not limited to them; it includes those who use vehicle ramming, straight-edged blades or knives, homemade explosives, and other deadly weapons.

**Active Shooter**
An individual actively engaged in killing or attempting to kill people in a confined and populated area, typically through the use of firearms. (*Active Shooter Events from 2000 to 2012*, 2014)

**Catastrophic incident**
Any natural or man-made incident, including terrorism, that results in extraordinary levels of mass casualties, damage, or disruption severely affecting the population, infrastructure, environment, economy, national morale, and/or government functions. A catastrophic incident could result in sustained regional or national impacts over a prolonged time period; almost immediately exceeds resources normally available to state, [territorial,] local, tribal, and private-sector authorities in the affected area; and significantly interrupts governmental operations and emergency services to such an extent that national security could be threatened. (All Hazards Consortium, draft definition)

**Consequence Analysis**

**Consequence Management (import from Sec 101)**
Measures to alleviate the damage, loss, hardship or suffering caused by emergencies. These include measures to restore essential government services, protect public health and safety, and provide emergency relief to afflicted entities. Consequence management response is under the primary jurisdiction of the affected state and local governments. Federal agencies support local efforts under the coordination of the Federal Emergency Management Agency (FEMA). (*Security 101, 2009*)

**Cybersecurity**
The activity or process, ability or capability, or state whereby information and communications systems and the information contained therein are protected from and/or defended against damage, unauthorized use or modification, or exploitation. Strategy, policy, and standards regarding the security of and operations in cyberspace, and encompass[ing] the full range of threat reduction, vulnerability reduction, deterrence, international engagement, incident response, resiliency, and recovery policies and activities, including computer network operations, information assurance, law enforcement, diplomacy, military, and intelligence missions as they relate to the security and stability of the global information and communications infrastructure. (*NCHRP Report 221: Protection of Transportation Infrastructure from Cyber Attacks: A Primer, 2015*)
Emergency
Any incident, whether natural or manmade, that requires responsive action to protect life or property. Under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, an emergency means any occasion or instance for which, in the determination of the president, federal assistance is needed to supplement state and local efforts and capabilities to save lives and to protect property and public health and safety, or to lessen or avert the threat of a catastrophe in any part of the United States. (Stafford Act and NIMS)

Emergency management
[Paraphrased] The broad class of agencies or people involved in the practice of managing emergencies and other incidents of all kinds. (NIMS, 2008)

Emergency Management Assistance Compact (EMAC)
A national interstate mutual-aid agreement that enables states to share resources during times of disaster. EMAC has grown to become the nation’s system for providing mutual aid through operational procedures and protocols that have been validated through experience. EMAC is administered by NEMA, the National Emergency Management Association, headquartered in Lexington, KY. EMAC acts as a complement to the federal disaster response system, providing timely and cost-effective relief to states requesting assistance from assisting member states. [Adapted from FEMA-EMAC, 2007]

Emergency management/response personnel
Includes federal, state, territorial, tribal, sub-state regional, and local governments, private-sector organizations, critical infrastructure owners and operators, nongovernmental organizations (NGOs), and all other organizations and individuals who assume an emergency management role. Also known as Emergency Responder. (See Section 2(6), Homeland Security Act of 2002, Pub. L. 107-296, 116 Stat. 2135 (2002). (NIMS, 2008)

Emergency response
The planned and actual response by multiple agencies to incidents that can include acts of terrorism, wildland and urban fires, floods, hazardous material spills, nuclear accidents, aircraft accidents, earthquakes, hurricanes, tornadoes, tropical storms, war-related disasters, public health and medical emergencies. [Adapted from (NIMS, 2008). The phases of ER are plan, prepare, respond, and recover. (NRF, 2008)]

Emergency Transportation Operations (ETO)
A coordinated, performance-oriented, all-hazard approach to support the development of a formal program for the improved management of traffic incidents, natural disasters, security events, and other emergencies on the highway system. Focuses on an enhanced role for state departments of transportation (DOTs) as participants with the public safety community in an interagency process. [Adapted from NCHRP Report 525, Volume 6, 2005.]

Exercises
An activity requiring the performance, integration, and coordination of response activities by several individuals and teams. Exercises (except for tabletop exercises) normally involve mobilization of personnel and resources. As noted in HSEEP Volume I, an exercise is carried out to train for, assess, practice, and improve performance. It can also be used to testing and validate policies, plans, procedures, training, equipment, and interagency agreements; clarify and train personnel in roles and
responsibilities; improve interagency coordination and communications; identify gaps in resources; improve individual performance; and identify opportunities for improvement. (NCHRP Synthesis 468: Interactive Training for All-Hazards Emergency Planning, Preparation, and Response for Maintenance and Operations Field Personnel, 2015)

**First responder**
Refers to those individuals who, in the early stages of an incident, are responsible for protecting and preserving life, property, evidence, and the environment, including emergency response providers as defined in Section 2 of the Homeland Security Act of 2002 (6 U.S.C. 101), as well as emergency management, public health, clinical care, public works, and other skilled support personnel (such as equipment operators) who provide immediate support services during prevention, response, and recovery operations (HSPD-8).

**Fusion Center**
Centers that integrate various streams of information and intelligence, including that flowing from the federal government, state, [territorial,] tribal, and local, governments, as well as the private sector, providing a more accurate picture of risks to people, economic infrastructure, and communities that can be developed and translated into protective (e.g., preventative or responsive) actions. The ultimate goal of fusion is to prevent man-made (terrorist) attacks and to respond to natural disasters and manmade threats quickly and efficiently should they occur. [Paraphrased from Rollins, 2008.]

**Hazard Identification**
The identification of a hazard of concern during a risk assessment. Part of the first of four steps of THIRA (Threat and Hazard Identification and Risk Assessment). (Comprehensive Preparedness Guide 201, 2013)

**Incident**
An occurrence or event, natural or manmade, that requires a response to protect life or property. Incidents, for example, can include major disasters, emergencies, terrorist attacks, terrorist threats, civil unrest, wildland and urban fires, floods, hazardous materials spills, nuclear accidents, aircraft accidents, earthquakes, hurricanes, tornadoes, tropical storms, tsunamis, war-related disasters, public health and medical emergencies, and other occurrences requiring an emergency response. (NIMS, 2008)

**Incident, traffic**
See *traffic incident*

**Incident Command System (ICS)**
A standardized on-scene emergency management construct specifically designed to provide for the adoption of an integrated organizational structure that reflects the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries. ICS is the combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure, designed to aid in the management of resources during incidents. It is used for all kinds of emergencies and is applicable to small as well as large and complex incidents. ICS is used by various jurisdictions and functional agencies, both public and private, to organize field-level incident management operations. (NIMS, 2008)
Infrastructure Protection
Securing critical infrastructure from all hazards by managing risk and enhancing resilience through collaboration with the critical infrastructure community. (Modified from the Mission of the DHS Office of Infrastructure Protection)

Major disaster
Any natural catastrophe (including any hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought) or, regardless of cause, any fire, flood, or explosion in any part of the United States, which in the determination of the president causes damage of sufficient severity and magnitude to warrant major disaster assistance under [the Stafford] Act to supplement the efforts and available resources of states, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused thereby. (Stafford Act)

Mission Area (National Preparedness Goal)
The National Preparedness Goal identified five mission areas in which it groups the 32 core capabilities (the distinct critical elements needed to achieve the goal): Prevention, Protection, Mitigation, Response, and Recovery. (FEMA “Mission Areas” page: https://www.fema.gov/mission-areas)

Mitigation (National Preparedness Goal)
The Mitigation mission area comprises the capabilities necessary to reduce the loss of life and property by lessening the impact of disasters. (FEMA “Mission Areas” page: https://www.fema.gov/missionareas)

National Preparedness System

Pandemic
An epidemic that has spread over several countries or continents, usually affecting a large number of people. In contrast, an Epidemic refers to an increase, often sudden, in the number of cases of a disease above what is normally expected in that population in that area. (CDC Self-Study Course SS1978: Principles of Epidemiology in Public Health Practice, 2006)

Physical Security
The part of security concerned with measures/concepts designed to safeguard personnel; to prevent unauthorized access to equipment, installations, materiel, and documents; and to safeguard them against espionage, sabotage, damage, and theft. (Security 101, 2009)

Prevention (National Preparedness Goal)
The Prevention mission area comprises the capabilities necessary to avoid, prevent or stop a threatened or actual act of terrorism. It is focused on ensuring we are optimally prepared to prevent an imminent terrorist attack within the United States. (FEMA “Mission Areas” page: https://www.fema.gov/missionareas)
Protection (National Preparedness Goal)
The Protection mission area houses the capabilities necessary to secure the homeland against acts of terrorism and manmade or natural disasters. (FEMA “Mission Areas” page: https://www.fema.gov/mission-areas)

Resilience (e.g. update this with NAS’s definition?)
The ability to prepare and plan for, absorb, recover from and more successfully adapt to adverse events. (Disaster Resilience: A National Imperative, 2012)

Resource Management (1)
Efficient incident management requires a system for identifying available resources at all jurisdictional levels to enable timely and unimpeded access to resources needed to prepare for, respond to, or recover from an incident. Resource management under the NIMS includes mutual-aid agreements; the use of special Federal, State, local, and tribal teams; and resource mobilization protocols. (Security 101, 2009)

Resource Management (2)
Those actions taken by a government to: identify sources and obtain resources needed to support disaster response activities; coordinate the supply, allocation, distribution, and delivery of resources so that they arrive where and when most needed; and maintain accountability for the resources used. (Security 101, 2009)

Response (National Preparedness Goal)
The Response mission area comprises the capabilities necessary to save lives, protect property and the environment, and meet basic human needs after an incident has occurred. (FEMA “Mission Areas” page: https://www.fema.gov/mission-areas)

Recovery (National Preparedness Goal)
The Recovery mission area comprises the core capabilities necessary to assist communities affected by an incident to recover effectively. (FEMA “Mission Areas” page: https://www.fema.gov/mission-areas)

Risk Assessment (1)
A systematic process whereby assets are identified and valued, credible threats to those assets are enumerated, applicable vulnerabilities are documented, potential impacts or consequences of a loss event are described, and a qualitative or quantitative analysis of resulting risks is produced. Risks are generally reported in order of priority or severity and attached to some description of a level of risk. (Security 101, 2009)

Risk Assessment (2)
A comprehensive study of a transit agency to identify components most vulnerable to criminal activity, including acts of terrorism and quasi-terrorism, and to assess the impact of such activity on passengers, employees, and the agency. (Security 101, 2009)

Risk Management (1)
The process of selecting and implementing security countermeasures to achieve an acceptable level of risk. (Security 101, 2009)
Risk Management (2)
The process of measuring or assessing risk and then developing strategies to manage the risk. Involves a prioritization process through which risks with the greatest adverse consequences and greatest probability of occurring are handled first, and risks with lower probability of occurrence and lower loss are handled later if at all. Requires balancing risks with a high probability of occurrence but lower loss against risks with high loss but lower probability. (Security 101, 2009)

Security Awareness
The capability of identifying, reporting, and reacting to suspicious activity and security incidents (Security 101, 2009). Establishing a security mindset of awareness in all employees can increase an agency’s security effectiveness. Security awareness is the cornerstone of a security culture. In a security culture, security is an integral part of the daily routine. The importance of security to daily work is understood by all employees, and each one takes responsibility to know the security risks that exist and the corresponding, appropriate measures to address potential and actual security issues. (Incorporating Transportation Security Awareness into Routine State DOT Operations and Training, 2014)

Security countermeasures
Actions that can be taken to avoid or mitigate security threats, the cornerstones of which are detect, deter, deny, and defend

Space Weather
Naturally occurring phenomena in the space environment that have the potential to disrupt technologies and systems in space and on Earth. These phenomena can affect satellite and airline operations, communications networks, navigation systems, the electric power grid, and other technologies and infrastructures critical to the daily functioning, economic vitality, and security of our Nation. (National Space Weather Strategy, 2015)

Sustainability
Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. One concept that adds context to sustainability is the triple bottom line. The triple bottom line includes three components—economic, environmental, and societal. In transportation, the triple bottom line relates to sustainable solutions in the areas of the natural environmental systems surrounding the transportation system, the economic efficiency of the system, and the societal needs (e.g., mobility, accessibility, safety, and equity). (2010 Status of the Nation’s Highways, Bridges, and Transit: Conditions & Performance, 2010)

Traffic incident
Any nonrecurring event that reduces roadway capacity or an abnormal increase in demand. Such events include traffic crashes, disabled vehicles, spilled cargo, highway maintenance and reconstruction projects, and special nonemergency events (e.g., ball games, concerts, or any other event that significantly affects roadway operations). (FHWA, 2010)

Traffic incident management
A tool to achieve and maintain public safety, travel efficiency, and air quality standards by reducing the impacts of traffic incidents. (I-95CC, 2009)
Training
According to NCHRP Synthesis 468, Training is the delivery of new information. Both Training and exercises are integral parts of emergency planning and the emergency preparedness cycle; they are related but distinct from each other. In contrast, Exercises provide the opportunity to practice knowledge, skills, and plans; are controlled activities conducted under realistic conditions; and range from tabletop exercises to full-scale exercises. For more information on training, NCHRP Synthesis 468 discusses several training delivery methods: Field crew meetings, Just-in-time training (JITT), Interjurisdictional and interagency training and exercises, Joint training, Asynchronous training, Train-the-trainer, Planned events and incidents, Discussion-based and Operations-based Exercises, Classroom training, Online training with live instructors, and Computer simulations. (NCHRP Synthesis 468: Interactive Training for All-Hazards Emergency Planning, Preparation, and Response for Maintenance and Operations Field Personnel, 2015)

Unified Command (UC)
An application of ICS used when there is more than one agency with incident jurisdiction or when incidents cross political jurisdictions. Agencies work together through the designated members of the UC, often the senior person from agencies and/or disciplines participating in the UC, to establish a common set of objectives and strategies and a single Incident Action Plan (IAP). (NIMS, 2008)

Vehicle Ramming
A form of attack in which a perpetrator deliberately rams a vehicle into a building, a crowd of people, or another vehicle. (Department of Homeland Security-FBI Warning: Terrorist Use of Vehicle Ramming Tactics, 2010)

Vulnerability Assessment
Systematic examination of a critical infrastructure, the interconnected systems on which it relies, its information, or product to determine the adequacy of security measures, identify security deficiencies, evaluate security alternatives, and verify the adequacy of such measures after implementation. A systematic evaluation process in which qualitative and/or quantitative techniques are applied to arrive at an effectiveness level for a safeguards and security system to protect specific targets from specific adversaries and their acts. In general, determining the vulnerability of a critical asset is the least difficult area of risk assessment. Both quantifiable and qualitative analysis can be performed to measure the current vulnerability status of the asset, as well as the effect of ongoing risk management improvements. Similarly, the return on investment of future actions can be forecast with some level of certainty. Vulnerability assessment considers the likeliness of a given scenario occurring by chance or intention. VA also postulates susceptibility and resultant damage. (Security 101, 2009)
Appendix E: TDOT Exercise Program

Comprehensive Exercise Program (CEP)

for
The State of Tennessee
Department of Transportation

July 1, 2015

Prepared by the
Tennessee Department of Transportation
Maintenance Division
This Comprehensive Exercise Program was prepared by the Tennessee Department of Transportation (TDOT) to develop, implement and maintain a viable emergency preparedness exercise program. This program was designed around State and Federal guidelines for such programs. Its primary purpose is to evaluate the emergency response capabilities and other emergency actions of the Tennessee Department of Transportation.
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IX. References
I. Introduction

A. Purpose

The purpose of this plan is to define and establish the framework for an agency-wide comprehensive emergency management exercise program for the Tennessee Department of Transportation (TDOT). This document defines the details of planning, scheduling and executing emergency management exercises for TDOT. For State consistency in documentation this document is known as The Comprehensive Exercise Program (CEP). For Federal Homeland Security Exercise and Evaluation Program (HSEEP) requirements, this document serves TDOT as the agency exercise guidelines for planning and delivering disaster, homeland security, and emergency management exercises.

The State of Tennessee uses the HSEEP process as a planning methodology and not as regulation. The TDOT CEP further serves to support the State Multi-year Training and Exercise Plan / Program (MTEP). As a supporting document to the Transportation Emergency Preparedness Plan (TEPP), the CEP program and the plan is designed to support and improve the response and recovery planning process via the multi-year exercise cycle. The TEPP defines the roles and responsibilities associated with the preparedness, response, and recovery efforts directed towards natural disasters, technological accidents, man-made events and other major incidents that impact the State of Tennessee, the Department of Transportation and the State’s transportation infrastructure system.

The purpose of the comprehensive exercise program is to:
1) Exercise the TEPP, supporting plans, catastrophic annexes and specific policies and procedures to ensure TDOT’s ability to respond effectively to the needs of the citizens and local jurisdictions during emergencies,
2) Exercise the Emergency Support Functions (ESF) assigned to TDOT under the Tennessee Emergency Management Plan (TEMP) to respond effectively to the needs of the citizens and local jurisdictions during emergencies there by improving individual and team performance, strengthening professional relationships, retaining skills, abilities, experiences and practicing or clarifying response organization roles and responsibilities,
3) Institutionalize and document the TDOT emergency management exercise program and its principles to regularly test or practice the skills, abilities, and experiences within the community of emergency management for the State of Tennessee. The CEP will also validate or test the capabilities of TDOT policies, plans, procedures, organization, equipment, facilities, personnel, training and agreements for the response and recovery phases that will allow for the return of TDOT and the transportation infrastructure system to a normal status as soon as possible; and to establish exercise program processes, practices, goals and objectives for TDOT emergency management stakeholders across the State.
4) Follow the State and agency policy and plan review cycle in order to validate the new or updated documents.
5) Establish a documented corrective action process / plan (CAP) and improvement plan (IP) that will ensure constant improvement in emergency response capabilities in TDOT. The CEP offers a process to track identified areas for improvement, areas to sustain, gaps in planning or shortfalls in policies, personnel, organization, equipment, and training; and implement recommended changes that will materially improve the emergency management program with the State in order to assist with effective and efficient response to an incident.
6) To comply with TEMA and Federal homeland security requirements and known emergency management best practices.
7) To exercise response operations and planning efforts according to contractual obligations.
8) To exercise emergency response operational plans for all PROBABLE and the more likely POSSIBLE hazards and threats to Tennessee.
9) To exercise the capabilities and legal guidelines to provide the service, assistance, coordination, and expertise to the citizens of Tennessee as described by the TEMP; and
10) To support to local jurisdictional training and exercise programs as best as is possible.

B. Goal

The goal of the CEP is to develop, implement and institutionalize a quality comprehensive, objective based and threat focused exercise program. The CEP provides policy, guidance, and standards for scheduling, uniformity in design, development, execution, and evaluation of emergency response exercises throughout TDOT. There is a great deal to be learned from well-planned and executed exercises. However, identifying, documenting and capturing the issues or items to be improved are the greatest benefit. The documenting process is not always just looking for items to be improved. It is not there to just find fault. The program also wants to identify items that worked well or successes so that they can also be maintained, shared and trained for future operations. The term “lessons learned” is a misnomer. Until it is identified and documented for improvement or defined as a success, it is yet to be determined that it has been “learned”. A more telling term is “lessons identified” or lessons “obtained”. It is a goal of this plan to convert lessons obtained into lesson learned by providing feedback into the emergency management training and operational communities that will truly improve and sustain emergency preparedness within TDOT. These exercise-identified lessons are the basis for improvement in emergency preparedness plans, training, organizations and resource requirements.

In order to achieve its goal the TDOT Comprehensive Exercise Program will:

- Establish relationships with members of State, local and Federal government emergency management communities as well as volunteer agencies and private industry in the design, development, conduct, and evaluation of exercises.
- Build on existing relationships across the State through the regional TDOT staff.
- Emphasize joint State and local exercises, with the support of State and Federal partners, addressing effective evaluation and identification of corrective actions or improvement planning.
- Provide flexibility for incorporating TDOT priorities, goals and objectives via needs assessments into each exercise.
- Consolidate exercise objectives and requirements so that individual exercises provide the opportunity to fulfill requirements in multiple program areas to achieve greater overall efficiency.
- Provide for the design of exercises that are shorter in duration and focus on the need to exercise particular emergency preparedness functions.
- Provide support for local agency emergency management exercise programs.

C. Scope

This comprehensive exercise plan (CEP) addresses the specific threats and hazards known to the State of Tennessee allowing for focused emergency preparedness exercise planning. These functions include: infrastructure items supporting transportation; and systems or organizations including warning; communications; engineering; evacuation; emergency welfare
services; and emergency transportation services. These activities are defined by Emergency Support Functions (ESF) related to the protection of the civil population by TCA 58-2-101-106.

The exercise program identifies specific hazards identified in the TEMP, by priority as probable or possible. This exercise plan addresses the known possible threats and hazards to Tennessee and its citizens. See appendix 1, multi-year exercise schedule.

D. Exercise Management
1. Exercises conducted in accordance with the TDOT CEP will be used to test, practice, and validate emergency preparedness skills, abilities, experience, plans, policies, procedures, equipment, systems, and facilities developed to mitigate, prepare for, respond to, and recover from the effects of all types of emergencies.

2. Exercises will be used to evaluate Emergency Operations Plans (TEPP and annexes) within TDOT. Observations and evaluations will be collected, analyzed and used to formulate After Action Reports (AAR) that will be the basis of the Corrective Action Plans (CAP) and improvement practices. The CAPs are recommended for all exercises conducted under the auspices of the TDOT CEP. In some cases the AAR documentation and improvement plans may be required to for reporting purposes.

3. Since the true purpose of any exercise is to determine areas to be sustained or improved, then one of the goals would be for each Emergency Support Function (ESF) assigned to TDOT in the TEMP to be exercised at least once during a three year period thereby validating the document and skills of the response staff. While some ESF’s like ESF 2 (communications) would be exercised in most exercises; others like ESF 15 (recovery) would take special efforts to develop an exercise with these objectives. The ESFs at the State level are staffed by Emergency Service Coordinators (ESC). The individual ESC participation will be handled on a case by case basis for particular exercise requirements based on stakeholder approved objectives.

4. Each exercise (workshop, table-top, functional, full-scale or otherwise) should include setting up a management system based on the concepts of Incident Command System (ICS) and the National Incident Management System (NIMS) system. The process of exercising the way the organization responds helps ensure the exercise objectives are valid and a quality set of results are obtained.

5. Exercises are conducted to evaluate an organization’s capability to execute one or more portions of its response or contingency plans based on known threats. Exercises are designed to demonstrate capability or detect shortcomings in order to capture planning, logistical, training or other areas in need of adjustment. The final part of the exercise process is to improve an organization’s ability to serve the citizens of their jurisdiction. Many exercise design formats are available for use in the field of Emergency Management. TEMA does not mandate a particular exercise design format although TEMA does recommend that State agencies and local jurisdictions plan and conduct exercises using a comprehensive Emergency Management Exercise Design format. Exercise Design can be relatively simple or rather complex according to the number of exercise objectives and the scope of the exercise. Exercises should be built from the objective up, not from the scenario down.

Standard exercise plans include the following:
• Defined scope (who, how much, to what extent, etc.)
• Purpose Statement (why are we having this exercise)
• Clear exercise objectives (simple, measurable, achievable, realistic, and task oriented) (SMART)
• Use of the concepts of the Incident Command System (ICS)
• Use of appropriate plans, procedures, policies, and laws
• Clearly defined exercise roles to include identifying players, safety officer, evaluators, and controllers. The Exercise Director should ensure that evaluators and controllers are knowledgeable of the function/event they are evaluating or controlling.
• Safety plan to include procedures for stopping the exercise or drill should an unsafe condition exist, briefings on conditions that may impact health or safety, (e.g. weather conditions; avoidance of vehicles or hazards), and procedures for providing timely medical care.
• Critique of the exercise involving all participants (“hotwash”) within 24 hours after the exercise, preferably immediately following the exercise.
• An After Action Report (AAR) submitted to the jurisdiction’s governing body; the AAR should identify the following for each exercise objective:
  o Are the procedures sound?
  o Are resources sufficient to support the procedures?
  o Are personnel adequately trained to follow the procedures and use resources?
• An Improvement Plan (IP) or Corrective Action Plan (CAP); the IP/CAP should identify the following:
  o What is the specific corrective action/improvement to be acted upon
  o Who will be responsible for the action
  o When will the action take place
  o How will the corrective action be resourced
  o How and when will the overseeing agency be notified that the corrective action is completed

6. The TEMA Operations Division is the 24-hour warning point for the State. The TCA requires State notification for many emergency and disaster response situations that occur across the State. As a result of this requirement, State notification is often an exercise requirement for State agency and local jurisdiction exercises. TEMA Operations will facilitate this exercise requirement whenever possible. TEMA Operations participation requirements are listed below.
• Any emergency exercise, drill, evaluation, game, etc that requests TEMA Ops participation must be coordinated prior to the event.
• All coordination with TEMA must go through the TDOT ESLs working with their respective TEMA Regional Office(s) or at the State level, through the TDOT ESCs working with TEMA Operations.
• Request for limited TEMA Ops play must include
  o Exercising agency
  o Point of contact: name, telephone, e-mail
  o Type of exercise: TTX, FE, FSX, drill, etc
  o Exercise location
  o Date and time of exercise
  o Specifically what does the exercising agency request TEMA Ops do for their exercise?
  o Approximate time TEMA Ops participation will be required
• It is understood that TEMA Ops is the State Watch Point with many daily duties and responsibilities. There is no Ops exercise cell, the Ops Officers that are participating in the exercise are on-duty Ops Officers that may have to break away from exercise play in order to deal with real-world situations.
• The TEMA State Emergency Operations Center (SEOC) participation during exercises is normally limited to the annual and bi-annual DOE and FNF exercises that are required for their particular programs. Activating the SEOC and appropriate ESCs is a large and expensive undertaking that is normally reserved for major, multi-agency exercises and real world events. Full or partial SEOC participation in exercise play will require extensive coordination and approval by the TEMA Director and will not normally be used for TDOT-driven exercises.

8. The TDOT Regional personnel are the backbone of TDOT’s response capability and the key players in the agency’s support to other State agencies local county governments and the customer service mission. The Regional personnel are the primary planners, participants, observers, and evaluators for the agency during exercise planning, execution, and post exercise activities throughout the State. Regional Directors may be asked to support local and State exercises with available resources whenever appropriate and possible.

9. Exercise and Live (real) incident documentation. The after action review (AAR) and improvement portions (improvement plans – IP) of this plan will be used to document agency responses. As with all AAR IP documents, this is intended to further document the response and capture the corrective action planning requirements to document improvement planning. This can address day to day mission tracking, exercises and large-scale, catastrophic events.

E. Exercise Documentation Reporting:
Based on State accreditation requirements emergency preparedness exercises will be scheduled and reported to the TEMA Planning Branch State Exercise Officer (SEO) or Exercise Coordinator (EC). TDOT will continue to schedule and document annual exercise activities through the program worksheet and the quarterly report submitted to the TEMA exercise coordinator. It is the intent of this process to ensure that TDOT is credited with participation in the required number of exercises. This will help ensure future availability of resources.

II. Authority.

The Tennessee Code Annotated (TCA) directs the Tennessee Emergency Management Agency to “establish guidelines and schedules for exercises that evaluate the ability of the State and its political subdivisions to respond…” This assignment of duty is the driving force for the Comprehensive Exercise Program. As such TEMA will exercise the emergency management capabilities of the State to provide the service, assistance, coordination, and expertise to the citizens of Tennessee as prescribed by the Tennessee Code Annotated (TCA) sections 58-2-16 (b)(1)(G), 58-2-101 to 124, TCA 58-2-401 to 403, TCA 58-2-501, TCA 58-2-601 to 604, TCA 58-2-701, TCA 58-2-801 to 813, TCA 58-8-101 to 112 and the TEMP. The TDOT exercise program follows the TEMA guidelines and schedules for emergency management exercises.

III. Exercise Standards and Participation

A. TDOT
1. It is the intent of TDOT to institutionalize these exercise standards and processes across the Department and to sustain these standards.
2. TDOT will use this exercise process to improve plans, support the continuity of government and support emergency management across the State.
3. Exercises are to be risk, threat and hazard based.
4. Exercises are to be designed around defined objectives that support the needs of TDOT.
B. **TEMA.** TEMA does not mandate any one particular exercise methodology or process; however, TEMA uses the guidelines defined in the DHS Homeland Security Exercise and Evaluation Program (HSEEP), the Emergency Management Accreditation Program (EMAP) and Emergency Management Performance Grant (EMPG) documentation. In order to assist in achieving and maintaining State-level accreditation, TDOT will follow those same guidelines.

C. **Emergency Management Principles.** In the process of planning for and coordinating exercises, these principles will provide a cornerstone for the overall process.

   1. **Comprehensive** – emergency managers consider and take into account all hazards, all phases, all stakeholders and all impacts relevant to disasters.
   2. **Progressive** – emergency managers anticipate future disasters and take preventive and preparatory measures to build disaster-resistant and disaster-resilient communities.
   3. **Risk-driven** – emergency managers use sound risk management principles (hazard identification, risk analysis, and impact analysis) in assigning priorities and resources.
   4. **Integrated** – emergency managers ensure unity of effort among all levels of government and all elements of a community.
   5. **Collaborative** – emergency managers create and sustain broad and sincere relationships among individuals and organizations to encourage trust, advocate a team atmosphere, build consensus, and facilitate communication.
   6. **Coordinated** – emergency managers synchronize the activities of all relevant stakeholders to achieve a common purpose.
   7. **Flexible** – emergency managers use creative and innovative approaches in solving disaster challenges.
   8. **Professional** – emergency managers value a science and knowledge-based approach; based on education, training, experience, ethical practice, public stewardship and continuous improvement.

D. **Emergency Management Accreditation Program (EMAP) (Standards 4.14)**

   Exercise, Evaluations and Corrective Actions - A program of regularly scheduled exercises and appropriate follow-through activities, designed for assessment and evaluation of emergency plans and capabilities, is critical to a State, territorial or local emergency management program. The entity shall evaluate program plans, procedures, and capabilities through periodic reviews, testing, post-incident reports, lessons learned, performance evaluations, and exercises. The product of these reviews are documented and disseminated within the program and to selected partners. Exercises shall be designed to test individual essential elements, interrelated elements, or the entire plans(s). A documented exercise program is established that regularly tests the skills, abilities, and experience of emergency personnel as well as the plans, policies, procedures, equipment, and facilities of the agency. The exercise program is tailored to the range of hazards that confronts the agency. Procedures shall be established to ensure that corrective action is taken on any deficiency identified in the evaluation process and to revise the relevant program plan. The corrective action process identifies and addresses deficiencies experienced in real world and exercise events.

E. **Department of Energy exercise program**

   Contractual obligations between the Department of Energy and the State of Tennessee require the State to conduct exercises to prepare the offsite response community for a potential emergency at the DOE Oak Ridge Reservation. There are two documents that are applicable to
the offsite DOE exercise program: the *Tennessee Oversight Agreement* (TOA) and *State of Tennessee Multi-Jurisdictional Emergency Response Plan for the Oak Ridge Reservation* (MJERP).

The proponent for the TOA is the Tennessee Department of Environment and Conservation (TDEC). TDEC is the lead State agency identified in the TOA. The TOA is an agreement between the U.S. Department of Energy and the State that provides an assurance of protection to citizens as well as financing for the responsibilities and obligations outlined in the document.

The MJERP is the off-site emergency response plan and is essentially an annex to the Tennessee Emergency Management Plan (TEMP). The MJERP is the plan under which TEMA, TDEC, TDOT and other State agencies operate during an emergency on any of the three Oak Ridge Reservation sites. The document has detailed information on what actions must be accomplished in the event of an emergency on any of the Oak Ridge Reservation sites and it assigns responsibilities to the various State agencies and local governments for an appropriate response.

Both documents task TEMA as the lead offsite agency, consistent with the TCA and TEMP, to coordinate with DOE and risk local governments on the conduct of emergency drills and exercises to include an annual full participation exercise, and drills involving communication, field monitoring, sheltering, and medical emergencies. TDOT is always a major player in these exercises and drills.

An exercise committee made up of DOE, TEMA, TDOT and other State agencies, volunteer agencies and local governments determine the objectives, scenarios, detailed timelines of exercise events, and evaluation criteria. TEMA is tasked with developing a *Corrective Actions Report* that identifies changes in plans, procedures, organization, or resources that must be made to correct the identified weakness areas.

The overall goal of the DOE exercise program is to improve the offsite response capabilities by testing the viability and effectiveness of the DOE MJERP. These required DOE exercises will be noted in the overall CEP multi-year schedule and counted toward exercise requirements for TDOT and other State agencies and host and risk counties.

**F. TVA Fixed Nuclear Facility (FNF) exercise program**

Similar to the Department of Energy exercise program FNF exercises are contractual obligations between the State, the Utility (Tennessee Valley Authority (TVA)) and the Federal Government; the State’s obligation is to support and participate in scheduled FNF exercises. The Federal Emergency Management Agency (FEMA) and Nuclear Regulatory Commission (NRC) are the overseeing Federal agencies for this exercise program. *The Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants* (NUREG-0654) and supporting revisions provide the standard by which the FNF/REP Program is measured for the purpose of exercises. For each exercise an Extent-of-Play (EOP) is written that contains six evaluation criteria. In those criteria are criterion/objectives that must be met. The exercise focus is on the viability and effectiveness of the Multi-Jurisdictional Radiological Emergency Response Plans (MJERP). These required TVA exercises will be noted in the overall CEP multi-year schedule and counted toward the EMPG requirements for host and risk counties. TDOT is also a major player in the FNF exercise program.
IV. Situation and Assumptions

A. Situation: The hazard identification section mentioned in Section I (Introduction) and V (Exercise Operations) describes the various threats and hazards to which the State may be subjected. It must also be realized that any event that occurs within the State of Tennessee might potentially affect one of the adjoining States, and vice versa. The defined five (5) year exercise cycle is identified and will be exercised in groupings for maximum training and exercise value based on the probable and likely priority threat to the State population. See Appendix 1: Multi-year exercise schedule.

B. Assumptions: The response to disasters and emergency management events begins and ends at home. However, local governments may be overwhelmed in their abilities to respond to the magnitude of the hazards that they may face. The State and Federal resources will play a significant role in response and recovery efforts. Most certainly response capabilities will be strained requiring mutual aid agreements and memorandums of agreement. The TEPP will be exercised to demonstrate those capabilities and where necessary make corrective actions to fix identified subject areas. TDOT’s portion of the larger State response and resource support will also exercise its capabilities to address the responsibility to support local government. All levels of government should exercise activities and resources (emergency support functions) that are common for their identified hazards and threats.

V. Exercise Operations

A. Mission of the TDOT Exercise Program. To exercise TDOT’s response to identified natural and human-caused hazards by validating existing capabilities (personnel an equipment), plans, procedures, policies, and practices, for the protection of the civil population; and to identify gaps or shortfalls in capabilities, plans, procedures, and processes to allow for corrective actions to be taken by converting lessons obtained into lessons learned and applied.

B. Intent. The safety of all Tennesseans is without a doubt one of the most important responsibilities of State government. As defined in the TCA, The Tennessee Emergency Management Agency is the lead State Agency for the planning of preparedness, response, mitigation, and recovery operations resulting from attack, natural or manmade disasters, or other emergency condition that arises in the State. As the lead agency TEMA will participate, observe, facilitate, evaluate, and/or coordinate, to the extent possible, emergency response, recovery, and mitigation exercises in Tennessee. Limited resources will preclude TDOT personnel from full participation in all exercises. The TDOT ESCs and Regional ESLs will work with TEMA HQ and Regional Offices, respectively to coordinate participation as appropriate for given exercises with local emergency management organizations and State agencies as needed. It is the goal of TDOT to support State and local emergency management exercise efforts to ensure that the citizens of the State are served by the most prepared capable and professional agencies possible. As such, all documentation of these events and results will be retained by the local organization for their internal use.

C. Exercise Purpose and Goal. The main goal of any exercise is to test plans, policies, procedures, practices and personnel; the design team must create a situation that does just that, no more, no less. There should be no hidden agendas or tricks in the design.
D. TDOT Exercise Design Working Group. The Exercise Design Working Group will be formed as needed and will be composed of personnel appropriate to the function being exercised. The Exercise Design Working Group will:

- Base all exercises against specific goals and objectives and not on scenario.
- Set scenario based on accomplishing the specific goals and objectives
- Staff the exercise based on the exercise design not on tradition
- Insure adequate play for all participants
- Conduct the proper type of exercise to meet the specific goal or objective (Seminar, Workshop, Table Top, Functional, Drill, Full-scale)
- Evaluation standards and forms should fit the exercise, again based against goals and objectives
- Utilize subject matter experts as evaluators, not just traditional personnel.

E. Exercise Stake Holders. The exercise stake holders are the Regional or Headquarters leadership. This group represents the chartering authority for the exercise. In many cases they may also represent the funding authority. The process of scheduling, funding and delivery of an exercise is done with the authority of this group.

F. Exercise Scheduling and Calendar

Exercises will be planned and conducted annually that aim to validate and improve the response, recovery, planning and mitigation to the identified hazards. Exercise priorities will shift from year to year in order to address identified hazards and the multi-year exercise cycle in Appendix 1. The TDOT ESC will coordinate with the TEMA staff, and other State, regional and Federal agencies for at least one (1) exercise per quarter and one (1) full-scale exercise (FSE) annually (as per Presidential Policy Directive 8, dated 30 March 2011). The State will continue to participate in local and regional exercises with primary focus on assisting with the improvement of local response capabilities and relationships with State, regional and Federal organizations. Regional personnel are encouraged to coordinate with their TEMA regional offices for exercise scheduling and planning assistance. See Appendix 1, TDOT Multi-year Exercise Schedule.

As required and requested, TDOT will participate in exercises with the U.S. Department of Energy (DOE) and Tennessee Valley Authority (TVA) annually or more often as agreed by separate official memorandums of understanding.

G. Exercise Scheduling and Reporting. In order to maintain an exercise schedule for both State wide (TEMA) events and regional or local emergency management exercises the State Exercise Officer will maintain a schedule and distribute it via the TEMA Regional Directors. The data will address the following; exercising jurisdiction (or agency), date of exercise, type of exercise and treat or hazard being exercised. Following the completion of an exercise the State Exercise Officer and the TEMA regional staff will update information to the State exercise schedule. This data will address EMPG reporting requirements for local jurisdictions and State level employee positions. The data will contain the following; Exercise organization, Participants, exercise dates, Exercise jurisdiction, exercise type, Exercise threat or hazard, and a short definition of the scenario. The TEMA regional EMPG exercise report will support this requirement. These two data sources are intended to facilitate coordination of exercises across the State and ensure grant requirements (EMPG) are met. The TEMA EC will forward exercise data as required to FEMA Region IV.
H. Training and Exercise Planning Workshop (TEPW). The TEMA Plans and Exercise Branch maintains a State wide exercise calendar. The calendar is distributed to State officials and available to local jurisdictions via the regional area coordinators. TDOT will report any planned exercises to the State Exercise Officer at TEMA so that it may be posted to the calendar. The purpose of the calendar is to ensure that personnel planning exercises across the State may coordinate with other exercising jurisdictions in order to facilitate information sharing and lessons learned before, during and after exercises.

While TEMA does not mandate its use, it encourages State agencies and local jurisdictions to utilize the Homeland Security Exercise and Evaluation Program (HSEEP), including the National Exercise Schedule (NEXS) and the Corrective Action Program (CAP) System for exercise scheduling and monitoring and tracking of corrective actions.

Actual emergencies that occur and demand an activation of the SEOC or incident management operations will count towards required exercise events. These events should be documented using an AAR process. The AAR is maintained locally, only the event report is forwarded to the State Exercise Officer for credit.

As per TEMA guidance, State agencies should participate in at least one exercise per quarter of any type (e.g., Drills, Tabletop Exercises, Functional), and one full-scale exercise within a 12-month period. Real world events do not count toward meeting this requirement.

TEMA facilitates a State-wide objective based, threat and hazard focused exercise program. As documented in the TEMP, the State has identified several hazards and assessed the likelihood of occurrence for each. Hazards are broken into two major categories Natural Hazards and Human-Caused Hazards, and further broken into accidental and intentional categories.

The TDOT multi-year exercise plan is based on these identified hazards. As part of the TEPP, TDOT will conduct exercises based on these listed threats. Based on known threats and review of hazards from across the State, the three (3) year exercise cycle laid out in Appendix 1 will be followed.

I. Exercise Design Guidelines. The Exercise Planning Cycle drives the planning process. The cycle is a never ending process of evaluating plans, process, procedures, equipment, training and policies. The cycle supports each level of leadership and functional area within the Department. The cycle consists of five recurring steps.
- Strategy Planning
- Exercise Design and Development
- Exercise Conduct
- Exercise Evaluation
- Improvement Planning

J. Objectives Based. TDOT will follow an objective-based exercise development model. Objective based exercises are just that, objective based. The exercise stakeholders meet during the exercise concept and objectives meeting to develop the exercise scope, purpose, level of participation, goals and objectives. It is important in this meeting to achieve a couple of points:
- Keep the list of objectives to something manageable. More is not better.
- Objectives should be SMART (Simple, Measurable, Achievable, Realistic, and Task-oriented).
- The exercise should focus on the identified local threat and hazards list.
- Build the exercise from the bottom up. In other-words, build it up from the desired objectives. Do not come in with a proposed scenario. The scenario supports the objectives, not the other way around.

**K. Local hazard and threat focused.** The exercise should be connected to the list of possible hazards. For example, the national planning scenarios identify a major hurricane as a scenario to plan for and exercise. Tennessee (including TDOT) will define objectives for this exercise that make sense for Tennessee and design an exercise that supports this requirement. Thus, Tennessee would exercise the threat of heavy rain and high winds, or for shelter of coastal evacuees. Tennessee would not exercise the response to storm surge. The hazard tables, at the end of this document, define the State of Tennessee identified hazards and the supporting Multi-year exercise schedule in Appendix 1.

**L. Exercise Types.** There are seven exercise types broken into two categories. The discussion based category includes; Seminars, Workshops, Table Tops, and Simulations or Games. The operational based exercises include; Drills, Functional, and Full-scale. Based on the purpose of the exercise and the objectives selecting the correct type of exercise is critical in order to achieve the desired out come.

- **Seminar.** A seminar is an informal discussion, designed to orient participants to new or updated plans, policies, or procedures (e.g., a seminar to review a new Evacuation Standard Operating Procedure).

- **Workshop.** A workshop resembles a seminar, but is employed to build specific products, such as a draft plan or policy (e.g., a Training and Exercise Plan Workshop is used to develop a Multi-year Training and Exercise Plan).

- **Tabletop Exercise (TTX).** A tabletop exercise involves key personnel discussing simulated scenarios in an informal setting. TTXs can be used to assess plans, policies, and procedures.

- **Simulation or Game.** A game is a simulation of operations that often involves two or more teams, usually in a competitive environment, using rules, data, and procedure designed to depict an actual or assumed real-life situation.

Operations-based Exercises validate plans, policies, agreements and procedures, clarify roles and responsibilities, and identify resource gaps in an operational environment. Types of Operations-based Exercises include:

- **Drill.** A drill is a coordinated, supervised activity usually employed to test a single, specific operation or function within a single entity (e.g., a fire department conducts a decontamination drill).

- **Functional Exercise (FE).** A functional exercise examines and/or validates the coordination, command, and control between various multi-agency coordination centers (e.g., emergency operation center, joint field office, etc.). A functional exercise does not involve any "boots on the ground" (i.e., first responders or emergency officials responding to an incident in real time).

- **Full-Scale Exercise (FSE).** A full-scale exercise is a multi-agency, multi-jurisdictional, multidiscipline exercise involving functional (e.g., joint field office, emergency
operation centers, etc.) and "boots on the ground" response (e.g., firefighters decontaminating mock victims).

M. Exercise Team. Exercise Development Team - Responsible to coordinate all exercise planning, scheduling and logistics activities.

1. Exercise Design Team - Responsible for the development of the objectives, concepts, scenarios, MSEL, exercise messages, support requirements and communication method and/or equipment.

3. Controller/Simulation Team - Responsible for the development of the Control/Simulation Plan. The plan should include the following at a minimum:
   • Exercise control and simulation activity management
   • Provisions for controller/simulator training and briefing
   • Procedures for monitoring and reporting of exercise activities to include the flow and pace of the exercise
   • Procedures to track the accomplishment of exercise objectives
   • Procedure to record the responses of players
   • Procedure for message injection to include the development of ad hoc messages to support exercise objectives
   • A list of required exercise forms to include instructions for use and preparation
   • Preparation for the critique
   • At the critique, successes and areas to improve will be collected by the TDOT Office of Emergency operations to prepare an After-Action review.

4. Evaluation Team - Responsible for the development of the EEG documentation and the evaluation process during the exercise delivery.

N. Exercise Planning and After Action Conferences. Following the approval by the stake holder group to hold the exercise a Concept and Objectives Meeting (C&O) is held. This meeting is attended by exercise officials, exercise planning team leader, TDOT personnel who have been identified as participants and any outside agency participants. The forum is to identify exercise goals, shape the objectives, develop exercise capability, and identify planning team members. This group represents all work units involved. It should not be a large group. It should have only one representative from each Region with the authority to approve the overall exercise concept and objectives. As said earlier, the objectives should be limited to only a few. Too many objectives will make the exercise very hard to design, difficult to deliver and cause loss of focus on the exercise outcome.

Initial Planning Conference (IPC) in HSEEP guidance is defined as mandatory. While the State of Tennessee (through TEMA) does not mandate the use of HSEEP guidance, the outcome of this meeting is important. The meeting is designed to shape the exercise, get input on scope, assumptions, artificialities, threat and hazards to be addressed, discussion and review of overall objectives as discussed in the C&O meeting. Each agency involved should have input on the objectives development process. The agency buy-in by all parties is important. While the scenario concept can be discussed here, remember the objectives come first. The objectives must be agreed to and finalized before the scenario and MSEL development effort can continue. The exercise development team and the design team are defined during this meeting. Team members
TEMA, Comprehensive Exercise Program (CEP),
Replaces TEMA CEP dated January, 31, 2006

Dated: 8 August, 2012

are assigned to develop documents (e.g. SITMAN, MSEL) and prepare logistics support. This meeting should also begin the discussion on the plan for exercise evaluation.

Mid-Term Planning Conference (MPC), In HSEEP guidance this meeting is defined as an optional meeting. It is used for complex operations based exercises. Its purpose is to discuss exercise staffing, documents, timeline, scheduling and logistics. It can review of the draft EXPLAN, Controller and Evaluator Handbook, etc.,

Master Scenario Events List Conference (MSEL) This meeting is for operations-based exercises. The meeting can be incorporated into MPC or FPC. This meeting is designed to review the exercise timeline. The MSEL is a chronological list that supplements the exercise scenario with event synopses, responses and provides the basis for the exercise injects.

Final Planning Conference (FPC) is an HSEEP required meeting for the exercise agency representatives. The stake holders may also be present. The meeting provides the final review of all exercise processes, procedures, documentation and approval of final drafts of all exercise materials.

After Action Conference (AAC) is the last meeting and is conducted several days or weeks following the exercise. Its purpose is to review the final after action report document. The report will include exercise observations and recommendations from the participants, exercise controllers and exercise documents such as the evaluations guides (EEG). Once approved, this AAR document becomes the official record of the exercise. This conference is usually facilitated by the exercise director and CAP leader.

O. Exercise Documentation. The list below briefly describes the important document types associated with most exercises.

■ Exercise Planning and Coordination Checklist, at Appendix 2 is a template to assist with exercise planning. It will support exercises from workshops through full-scale events.

■ A Situation Manual (SitMan) is a participant handbook for discussion-based exercises, particularly TTXs. It provides background information on exercise scope, schedule, and objectives. It also presents the scenario narrative that will drive participant discussions during the exercise.

■ The Exercise Plan (ExPlan), typically used for operations-based exercises, provides a synopsis of the exercise and is published and distributed to players and observers prior to the start of the exercise. The ExPlan includes the exercise objectives and scope, safety procedures, and logistical considerations such as an exercise schedule. The ExPlan does not contain detailed scenario information.

■ The Controller and Evaluator (C/E) Handbook supplements the ExPlan for operations-based exercises, containing more detailed information about the exercise scenario and describing exercise controllers’ and evaluators’ roles and responsibilities. Because the C/E Handbook contains information on the scenario and exercise administration, it is distributed only to those individuals specifically designated as controllers or evaluators.

■ The Master Scenario Events List (MSEL) is a chronological timeline of expected actions and scripted events (i.e., injects) to be inserted into operations-based exercise play by controllers in order to generate or prompt player activity. It ensures necessary events happen so that all exercise objectives are met.
A Player Handout is a 1-2 page document, usually handed out the morning of an exercise, which provide a quick reference for exercise players on safety procedures, logistical considerations, exercise schedule, and other key factors and information.

Exercise Evaluation Guides (EEGs) help evaluators collect and interpret relevant exercise observations. EEGs provide evaluators with information on what tasks they should expect to see accomplished during an exercise, space to record observations, and questions to address after the exercise as a first step in the analysis process. The EEGs are not meant as report cards. Rather, they are intended to guide an evaluator’s observations so that the evaluator focuses on capabilities and tasks relevant to exercise objectives to support development of the After Action Report/Improvement Plan (AAR/IP).

An After-Action Report/Improvement Plan (AAR/IP) is the final product of an exercise. The AAR/IP has two components: an AAR, which captures observations and recommendations based on the exercise objectives as associated with the capabilities and tasks; and an IP, which identifies specific corrective actions, assigns them to responsible parties, and establishes targets for their completion. The lead evaluator and the exercise planning team draft the AAR and submit it to conference participants prior to an After Action Conference (see below). The draft AAR is distributed to conference participants for review no more than 30 days after exercise conduct. The final AAR/IP is an outcome of the After Action Conference and should be disseminated to participants no more than 60 days after exercise conduct.

P. Exercise Design and Development

The exercise process can be a very deliberate series of steps that ensure all organizations have input and all requirements are met. The exercise design process should address the principles of being:
- Objectives-based
- Focused on identified threats and hazards
- Capabilities- and Performance-based

Following this short list of principles will help ensure a NIMS compliant exercise and consistence in use of HSEEP guidelines. The use of SMART objectives that address specific community plans or procedures associated with known capabilities help keep the exercise design process focused and allow for a well delivered event.

Q. Exercise Design Considerations

- Each Region or Division will submit a list of objectives or goals that they would like to accomplish during this exercise. The Master Scenario Events List (MSEL) will be tailored to meet these specific needs, as well as unplanned responses. A chief evaluator and his team will evaluate the exercise based on the exercise objectives.
- Implementation of disaster response plans, polices, and procedures during the exercise will depict actions that would be expected to occur under actual response conditions and, therefore, will provide a sound basis for evaluation.
- Some personnel and equipment will be pre-positioned at exercise locations prior to the start of the exercise. Some simulation during the exercise will replace actual participation. Caution here – Do not allow unrealistic simulation. There is a difference between simulation and unrealistic.
- The type of exercise selected by the jurisdiction should be consistent with the Multi-year Training and Exercise Plan.
TEMAS Comprehensive Exercise Program (CEP),
Replaces TEMA CEP dated January, 31, 2006
Dated: 8 August, 2012

- Exercise objectives should be based on capabilities and their associated critical tasks.
- Any Region or Division may wish to create its own Simple, Measurable, Achievable, Realistic, and Task-oriented (S.M.A.R.T.) objectives based on its specific plans/procedures associated with required response capabilities and tasks.
- The scenarios used in exercises should be tailored toward validating the capabilities, and should be based on TDOT’s risk/vulnerability assessment.

R. Scenarios. The scenarios used in exercises and the supporting Master Scenario Event List (MSEL) should be crossed-walked with the objectives and selected capabilities. No event should be on the MSEL that does not support the objectives or the selected capabilities. The selected scenario should be approved by the stakeholders and connected to the entity’s risk/vulnerability assessment. The scenario, while connected to the community threat and hazard lists is not overly important. The scenario supports the delivery of the exercise objectives, not the other way around.

S. Exercise Conduct. After the design and development steps are complete, the exercise takes place. Exercise conduct steps include set up, briefings, facilitation of and conduct of the exercise, evaluation, wrap up and a hot wash. The MSELs are used by the exercise control team to drive the exercise following the time line developed by the design team. The evaluation team uses the EEG documentation to evaluate the participants activities in response to the unfolding scenario and the tasks required.

It is important open the exercise introduction briefing with addressing the exercise objectives with the participants and to close the exercise hot wash following the exercise be reviewing the objectives again. This process helps keep the objectives in front of all the participants and ensure awareness.

T. Exercise Hotwash. The “hotwash” is a term for a meeting that happens with exercise participants, evaluators and controllers immediately following the exercise. It is important to do this immediately following the event while events and conservations are still fresh. The data collected here captures participant’s thoughts on; what happened, why it happened, and its possible impact. The discussion should allow for open discovery of observations and comments without concern for retribution.

U. After Action Reporting (AAR) and Improvement Planning / Corrective Action Plan. The results of exercises are not always known or clear immediately following an exercise. The hotwash and the following After Action Conference (AAC) are arguably the most important events and documents that come from the whole exercise development and delivery process

V. Documentation and Dissemination. The final, approved AAR and its CAP/IP should be sent to all exercise stakeholders tasked with a portion of the improvement plan. The exercise director and the corrective action coordinator have the responsibility to assist with this distribution to exercise players.

The conclusion and close out of the exercise is complete when the corrective action coordinator reports that all listed improvement planning items are complete. The CAP coordinator will manage this process.
VI. Exercise Administration and Logistics Operations

For discussion-based exercises this section is can be very simple and short. However, for operational based exercises this section should have more detail. For a full-scale exercise it would be very detailed.

A. Safety

Safety is of the utmost importance. It is most critical during some functional and always during full-scale exercises. However, it applies to all operations, including training and exercise activities.

**NOTE:** EVERYONE BECOMES A SAFETY OFFICER DURING AN EXERCISE AND HAS THE AUTHORITY AND DUTY TO STOP THE EXERCISE IF THEY WITNESS AN UNSAFE ACT OR CONDITION.

A PRINCIPLE SAFETY OFFICER WILL BE ASSIGNED FOR THE EXERCISE WHO HAS THE AUTHORITY TO STOP ACTIVITIES IF AN UNSAFE CONDITION EXISTS.

B. Exercise Planning and Coordination Checklist

The exercise planning checklist, at Appendix 2, is designed to support exercise delivery for events ranging from workshops to full-scale exercises. This checklist provides management, coordination and logistics functions for the exercise committee.

C. Health and Welfare Considerations

This section of the Exercise Plan allows the identification of any hazards of concerns in the exercise area. It may also define location of cooling or warming areas for exercise staff along with drinking water or refreshment sources.

D. Meal Plan

This section allows the logistics officer to define how exercise staff will be feed during the exercise.

E. Medical Issues

The plan should address the “real world” medical response plan and how the actual “real world” medical team is contacted.

F. Weather Observations

The exercise staff should offer a real world weather report and address exercise operation if inclement weather should arrive.

VII. Exercise Direction Control & Communications

A. Exercise Leadership and Positions

The following positions should be identified:
Exercise Committee
Exercise Design Team
Lead Controller
Lead Evaluator
B. Participant Leadership
The senior exercise participants should be defined so the exercise staff is aware.

C. Communication
The radio or communication methods should be defined and the channels or frequencies for player use, and exercise control. This should be noted in the exercise planning documentation. All communications at the beginning and end of each transmission will State: THIS IS AN EXERCISE.
## VIII. State Threat/Hazard Tables for Exercise Planning:

### Exercise Year 1

<table>
<thead>
<tr>
<th>NATURAL HAZARD</th>
<th>HUMAN-CAUSED HAZARD</th>
<th>Accidental</th>
<th>Intentional</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROBABLE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe Weather / Tornado Outbreak</td>
<td>Transportation (Hazmat)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winter Weather</td>
<td>Communications Failure</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Energy Failure</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hazardous Materials</td>
<td></td>
<td></td>
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### Exercise Year 2

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<tr>
<td>PROBABLE</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Severe Weather</td>
<td>Transportation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flood</td>
<td>Hazardous Materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geological Hazard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POSSIBLE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dam or Levee Failure</td>
<td>Terrorism</td>
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### Exercise Year 3

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</thead>
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<tr>
<td>PROBABLE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe Weather / Tornado Outbreak</td>
<td>Transportation</td>
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<td></td>
</tr>
<tr>
<td>Severe Winter Weather</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Energy Failure</td>
<td></td>
<td></td>
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<td>Continuity of Operations (COOP)</td>
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<td>Earthquake</td>
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<tr>
<td>Dam or Levee Failure</td>
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<td>Hazardous Materials</td>
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Master Hazard Table

<table>
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<tr>
<th>HAZARDS IDENTIFICATION</th>
<th>AND PRIORITY</th>
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<td>Accidental</td>
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<td>PROBABLE</td>
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</tr>
<tr>
<td>1</td>
<td>Severe storm (not tornado or winter)</td>
</tr>
<tr>
<td>2</td>
<td>Tornado Out Break</td>
</tr>
<tr>
<td>3</td>
<td>Flood</td>
</tr>
<tr>
<td>4</td>
<td>Severe winter storm</td>
</tr>
<tr>
<td>5</td>
<td>Wild Fire / Fire</td>
</tr>
<tr>
<td>6</td>
<td>Geologic hazard</td>
</tr>
<tr>
<td>7</td>
<td>Extreme temperature</td>
</tr>
</tbody>
</table>

| POSSIBLE | |
| 1 | Drought |
| 2 | Biological (human and animal) |
| 3 | Earthquake |

| UNLIKELY | |
| 1 | Famine |
| 2 | Range Fire |
| 3 | Hurricane |
| 4 | Avalanche |

| NO THREAT | |
| Tsunami, volcano, glacier/iceberg, tidal surge, tropical cyclone, aircraft "blue ice," asteroid/comet/meteors, etc. Such events are conceivable, but the probability is so low, that they are not considered a threat to Tennessee. Environmental concerns such as air or water pollution and contamination are subsets of other emergencies, or are routine non-emergency tasks that are transferred to the mission of another agency. |
IX. References and Resources


Tennessee Emergency Management Plan (TEMP).


APPENDIX 1: PRIORITIES AND FOCUS

I. Introduction
   The purpose of this appendix is to establish the priority and multi-year exercise focus based on a six year cycle. One of the CEP’s overarching goals is to ensure that the Transportation Emergency Preparedness Plan (TEPP) addresses the needs of the State during emergencies, and to provide a recovery system to return TDOT and the transportation infrastructure system to a normal status as soon as possible after such emergencies. The TEMP defines the roles and responsibilities associated with the preparedness, response, and recovery efforts directed at natural disasters, technological accidents, terrorism and other major events that might impact the State of Tennessee. This cyclic exercise schedule will address the threats to the State and the proper validation of TDOT plans. The specific purposes of exercise planning and evaluation are:
   a. To exercise emergency responses to all possible and the more likely probable threats to Tennessee, such as tornados, flood, winter weather, drought, fire, earthquake, and hazardous materials accidents.
   b. To establish a corrective action program (CAP) that will identify shortfalls in policies, personnel or equipment that may prevent effective or efficient response to emergency or disaster situations. The CAP will put in place corrective actions and identify successes to be retained and shared.

II. Hazard Identification
   The State has identified hazards and assessed the likelihood of occurrence for each. This is found in the State Mitigation Plan and echoed in the TEPP. Hazards are broken into two major categories Natural Hazards and Human-Caused Hazards, the latter is further broken into accidental and intentional categories. These are listed with the exercise design plan.

III. Exercise Scheduling
   Exercises will be planned and conducted annually that aim to improve the planning, response, recovery, and mitigation to the identified State hazards. Exercise priorities will shift from year to year in order to address all identified hazards within a three-year cycle. TDOT will continue to participate in local exercises with primary focus on improving local capabilities with State and Federal assistance. As a matter of practice in scheduling TDOT will not conduct exercises during the period of March – May annually. This period is known to have natural-caused weather-driven events.

Exercise Year Focus Areas
   - Response
   - Recovery
   - Resource Operations and Logistics
   - Communications
   - Disaster Assistance
   - Target Capabilities

Regional Tennessee Catastrophic (TNCAT) cycle
   - West - 2014
   - Middle - 2015
   - East - 2016
APPENDIX 2 TENNESSEE MULTI-YEAR EXERCISE PLAN

1. Training Year 2015 (October 2014 – September 2015)
   Exercise Priority
   1. Transportation accident (Hazmat)
   2. Terrorism
   3. Tornado Outbreak
   4. Communications
   5. Winter Weather
   6. Energy failure
   7. Hazardous Materials

2. Training Year 2016 (October 2015 – September 2016)
   Exercise Priority
   1. Severe Weather / Flood
   2. Geological Hazard
   3. Dam or Levee failure
   4. Transportation (non Hazmat)
   5. Terrorism
   6. Communications
   7. Hazardous Materials

3. Training Year 2017 (October 2016 – September 2017)
   Exercise Priority
   1. Earthquake
   2. Dam or Levee Failure
   3. Communications
   4. Continuity of Operations
   5. Energy Failure
   6. Severe Weather / Winter Storm / Tornado Outbreak
   7. Hazardous Materials
APPENDIX 3: EXERCISE DESIGN TEMPLATE

Exercise Plan

General Section

This Exercise Plan identifies policies, procedures, administrative requirements, and exercise roles and responsibilities that will support exercise-planning initiatives.

Exercise Type

State what type of exercise is going to be conducted:

1. Orientation
2. Drill
3. Tabletop
4. Functional
5. Full-Scale

Exercise Purpose

This Exercise Plan provides exercise developers with guidance concerning procedures and responsibilities for exercise design and support. It explains the exercise concept, establishes the basis for the exercise, and establishes and defines the communications, logistics, and administrative structure needed to support the exercise—before, during and after.

[Describe the purpose of the plan itself and the mission and goals of the exercise. Provide specific information to exercise developers on the exercise objectives, points of review, administrative procedures and methods of control for simulation and evaluation. Most importantly, lay out the exercise methodology, including Control and Evaluation Team structure, team member responsibilities, and procedures.]

Scenario Narrative

[Briefly describe the hazard and related events and conditions setting the stage for the exercise. Provide background information for the emergency to enhance the realism of the situation.]
Scope

[Describe type of exercise, scope of exercise, dates of exercise, primary exercise locations, hours of operations, participating organizations, and the briefing/narrative summary that will start the exercise as follows.]

Exercise play will officially begin on [insert time, day of week, date] and end at approximately [insert time, day of week, date] as determined by the exercise director. The exercise will be played [insert number of hours] per day at all primary exercise locations; however, some locations [insert if some are out of sequence or have limited extents of play]. On [insert date] the exercise will be initiated by a [describe whether briefing, incident, or video and provide a general description of the information. Example: The briefing will begin with a description of the situation as it currently exists. The briefing will describe background actions that have been taken by emergency response organizations as well as a review of the weather situation. This background briefing will be based on the information in Scenario Narrative.] There will be a post-exercise meeting at each player location on [insert date]. (May use calendar to illustrate scheduled activities.)

List of Exercise References

[The following are types of references to be listed.]

- Student Manual
- Agency EOC staffing pattern
  - Locations
  - EOC positions w/ descriptions
- Exercise Control Plan
- Exercise Evaluation Plan
- Exercise Scenarios
- Job Aids

Assumptions, Artificialities, and Simulations

[The following assumptions are fairly generic; you may modify and/or add specifics for your own exercise.]

The assumptions, artificialities, and simulations applicable during the exercise are provided in the following paragraphs.
Exercise Assumptions

The following assumptions must be made in order to ensure that the exercise is as realistic as possible. It is intended that exercise events progress in a logical and realistic manner and that all exercise objectives be achieved during exercise play.

- Exercise participants are well versed in their own department and agency response plans and procedures.
- The term “participants” includes planners, controllers, simulators, evaluators, and players.
- Players and controllers will use real-world data and information support sources.
- Players will respond in accordance with existing plans, policies, and procedures. In the absence of appropriate written instructions, players will be expected to apply individual initiative to satisfy response and recovery requirements.
- Implementation of disaster response plans, policies, and procedures during the exercise will depict actions that would be expected to occur under actual response conditions and, therefore, will provide a sound basis for evaluation.
- Actions to direct unit, personnel, or resource deployments will result in simulated movement during the exercise unless live deployment in real time is stipulated to achieve an exercise objective.
- Real-world response actions will take priority over exercise actions.

Exercise Artificialities

It is recognized that the following artificialities and constraints will detract from realism; however, exercise planners should accept these artificialities as a means of facilitating accomplishment of exercise objectives.

(This section will be based upon your extent of play agreements and include any pre-exercise player activity or pre-positioning of equipment. The following are examples.)

- The exercise will be played in near-real time; however, to meet exercise objectives, some events may be accomplished by participants before the exercise, and other events may be accelerated in time to ensure their consideration during play.
- Many alert, notification, initial activation, and emergency response procedures, as well as some early response actions, will not be a part of the exercise.
- Responses obtained by players from simulations may not be of the quality or detail available from the real organization or individual.
Exercise Artificialities (Continued)

During the exercise, actions may occur to direct unit, personnel, or resource deployments, and subsequent movement of resources may be played; however, these actions may be simulated with no live movement occurring in the exercise.

Some personnel and equipment may be pre-positioned at exercise locations rather than moved in real-time during the exercise, and they will enter play at predetermined times from their pre-positioned locations. When this exercise artificiality occurs, it will be referred to in exercise documentation as exercise pre-positioning to differentiate it from the live deployments that will be evaluated.

Exercise Simulations

Simulation during exercises is required to compensate for nonparticipating individuals or organizations. Although simulations necessarily detract from realism, they provide the means to facilitate exercise play.

[Describe, in general, any areas that will be simulated. Examples include weather information, simulation of nonparticipating organizations, media, victims, evacuees, etc.]

Exercise Objectives

[Each developed exercise requires objectives that provide the foundation and guidance for exercise development. Objectives are designed to reflect the validity of community plans, procedures and systems and provide the basis for exercise control/simulation and evaluation. The following are examples of exercise objectives.]

Demonstrate the capability to initiate public warning procedures at the EOC, including activation of the Emergency Alert System (EAS).

Demonstrate the capability of the local EOC to coordinate the comprehensive response activities.

Demonstrate the capability of management to conduct and coordinate an evacuation.

Demonstrate responsible organization capability to identify shelters and mass care facilities for immediate use.

Demonstrate the collection and dissemination of information to the public during emergency operations.

Demonstrate the capability to conduct rapid situational assessment.

Demonstrate the ability to identify immediate supplemental medical assistance to meet the health and medical needs of disaster victims.

Demonstrate procedures for tracking assets and resources committed to response operations.

Demonstrate the ability to prioritize and use jurisdictional resources and assets for maximum effectiveness during response operations.

Demonstrate the procedures for requesting assistance from higher levels of government.
**Exercise Concept**

[Describe procedures before, during, and after the exercise to be taken by the various exercise development teams. Describe how each team will interact with other participants. List the procedures that each team’s members will follow to fulfill their responsibilities.]

**Management Structure**

[Describe the exercise development team organizational structure as follows.]

Overall exercise planning, conduct, and evaluation for the exercise is the responsibility of the [insert title]. [Title] is responsible for coordinating all exercise planning activities between [insert Federal, State, and local departments and agencies and other participating organizations. Identify others in charge at each organizational level. Include those in charge of control and evaluation.].

**Exercise Team Staffing, Rules, and Procedures**

[For a large exercise, there may be an exercise director with assistants and other functional areas besides evaluation and control and simulation, such as support and coordination. Adapt the following text and charts to reflect your exercise management structure.]

The team chiefs and personnel selected as exercise team members must be knowledgeable of emergency management and response functions. [Insert other qualifications identified by the exercise management team leader.] They need this knowledge to understand ongoing exercise activities and to be able to track them. In order to meet this need, individuals who meet these requirements may be recruited from nonparticipating (or participating) emergency response organizations.

The exercise team will identify rules or guidelines for conduct during the exercise and will identify procedures of the exercise—before, during and after.
Exercise Team Staffing, Rules, and Procedures (Continued)

The following team structure will be used. [Identify exercise control team organization. Modify the chart below to reflect organization. Specific action sites should be added, such as State and local EOCs. If one simulation cell is used for all locations, modify the chart accordingly]

![Exercise Design Structure Diagram]

**Exercise Design Structure**

1. **Exercise Design Team** – Responsible for coordinating all exercise planning activities. The Exercise Director will assign exercise tasks and responsibilities, provide guidance, establish timelines and monitor the development process. The team chief is responsible for developing the exercise objectives, concepts, scenarios, master scenario events list, exercise messages administrative support requirements, communication methods.

2. **Control/Simulation Team** – The control/simulation team chief is responsible for the development of the Control Plan. The plan should include but not be limited to the following:

   - Exercise control and simulation activity management.
   - Provisions for controller/simulator training and briefing.
   - Procedures for monitoring and reporting of exercise activities to include the flow and pace of the exercise.
   - Procedures to track the accomplishment of exercise objectives.
   - Procedures to record the responses of players.
   - Procedures for message injection, including the development of ad hoc messages to support exercise objectives.
   - A list of required exercise forms, including instructions for use and preparation.
   - Preparation for the critique.
Exercise Design Structure (Continued)

3. **Evaluation Team** – The Evaluation Team Chief is responsible for the development of the Evaluation Plan. The plan should include all evaluation activities that should occur before, during, and after the exercise. Evaluation activities should include but not be limited to the following:

- Exercise evaluation activity management
- Provisions for evaluator training and briefing
- Procedures for monitoring and evaluating exercise activities
- Procedures to track the accomplishment of exercise objectives
- Procedures to record and evaluate the responses of players
- Procedures to track message injection, including the development of ad hoc messages to support exercise objectives
- A list of required exercise forms, including instructions for use and preparation
- Preparation for the critique

4. **Participant Support Team** – The participant support team is responsible for coordinating exercise support activities. This team works with the other teams to develop consistent staff briefings for the controllers, simulators, evaluators, and participants and develops the player handbook.

The handbook should contain a list of instructions for players and provide information regarding player responsibilities and functions to be performed during the exercise. The handbook should contain but not be limited to the following:

- A schedule of player exercise briefings
- Provisions for review of community or organization plans, policies and procedures
- Scenario overview
- Exercise objectives
- Procedures for preparation of exercise-generated messages, logs, and reports
- Emergency Operating Center procedures
- Expected player actions
- Administrative requirements
- Recommended pre-exercise training events
Safety and Security

[Describe the safety procedures, to include canceling of the exercise if an actual emergency occurs. Detail any special security issues involved with the exercise, location, or equipment.]

Administrative and Logistical Support Requirements

Administrative and logistical support will be required to support all phases of the exercise. The level of support required will depend upon the complexity and length of the exercise, number of players involved, and the number of objectives being demonstrated. Administrative and logistical support consists of personnel, equipment, supplies and facilities.

[Describe the logistics and administrative support that will be provided at each exercise location. Examples of areas to consider when developing logistics/administrative support for the exercise are given below.]

- Administrative support at exercise locations/action sites
- Personnel to assist with pre-exercise training registration, training, and packaging of training materials
- Information on facilities (rooms etc.) for the exercise

Site Preparation / Support

[Describes site preparations that may be necessary to meet exercise objectives and test plans and procedures.]

Job Aids

[List those aids that will assist the design team.]
## TDOT TRAINING NEEDS ASSESSMENT

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<th>Current Course Offerings</th>
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<th>2018</th>
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<td><strong>Projected number of CLASSES required to meet Need (use 15 people per class for calculation)</strong></td>
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<td>Professional Development Courses</td>
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<td>TEMA 101</td>
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<tr>
<td>Instructor Methodology</td>
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<tr>
<td>Principles of Emergency Management</td>
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<tr>
<td><strong>Incident Management &amp; Command</strong></td>
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<tr>
<td>ICS 100/200 Classroom</td>
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<tr>
<td>G-300 ICS for Expanding Incidents</td>
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<td>G-400 Advanced ICS</td>
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<td>G-191 ICS/EOC Interface Course</td>
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<td>S-775 TN EOC Operations Course</td>
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<tr>
<td>G-402 ICS Overview for Executives and Senior Leaders</td>
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<td><strong>Hazardous Materials Courses</strong></td>
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<td>Hazardous Materials Awareness</td>
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<td>Hazardous Materials for Operational Level Response</td>
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<tr>
<td><strong>Radiological Courses</strong></td>
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<tr>
<td>Modular Emergency Response Radiological Transportation Training (MERRTT) (16 Hours)</td>
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<tr>
<td>MERRITT (TEMA Rad) (8 Hours)</td>
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<tr>
<td>Fundamentals Course for Radiological Response (320) (24 Hours)</td>
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<td><strong>Search and Navigation Courses</strong></td>
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<tr>
<td>TEMA Search Operations – 8 hrs.</td>
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<td>GPS Land Navigation Course</td>
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<td>Basic Visual Tracking</td>
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<td>Managing Search Operations</td>
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<tr>
<td><strong>FEMA courses:</strong></td>
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<td>Damage Assessment Workshop</td>
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<td>Exercise Development</td>
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<td>Basic Public Information</td>
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<td><strong>Other courses:</strong></td>
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<tr>
<td>ICS Train-the-Trainer Course</td>
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<td>Communications Leader Course (ComL)</td>
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<td><strong>Other courses:</strong></td>
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<tr>
<td>Auxiliary Communications Course (AuxComm)</td>
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<tr>
<td>Emergency Management Support Team (EMST) Training</td>
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Projected Training Needs for FY 2017 & 2018
Other Offerings:

**National Domestic Preparedness Consortium (DHS funded courses):** The National Domestic Preparedness Consortium (NDPC) is a professional alliance sponsored through the Department of Homeland Security/FEMA National Preparedness Directorate. The NDPC focus is to address the counter-terrorism preparedness needs of the nation’s emergency first responders within the context of all hazards including chemical, biological, radiological, and explosive Weapons of Mass Destruction (WMD) hazards.

The consortium is made up of members, that include the Center for Domestic Preparedness (CDP) in Anniston, Alabama, the New Mexico Institute of Mining and Terrorist Education (National Center for Biomedical Research and Training), Texas A&M University National Emergency Response and Rescue Training Center (TEEX), the Department of Energy’s Nevada Test Site (NTS), the Transportation Technology Center, Inc. (TTCI), and the National Disaster Preparedness Training Center at the University of Hawaii (NDPTC).

Information about the course offerings for these classes can be found at: [http://www.ndpc.us/index.html](http://www.ndpc.us/index.html)

**Federal Emergency Management Agency, National Emergency Training Center, Emmitsburg, Maryland.** The National Emergency Training Center has a variety of courses that can be conducted in the state.

You can access the list of other training courses from the National Domestic Preparedness Consortium and the Federal Emergency Management Agency through the TEMA Web page under training, federal training resources.


Submitted by: __________________________________________________

Agency: ________________________________________________________
Appendix F: Agency Wallet Card Examples

Here are two examples of State DOT wallet cards with key contacts for the agency. To supplement the wallet card, these contacts can be programmed into the State Director’s office phone, cell phone (and Sat phone).

EXAMPLE: Illinois Department of Transportation

<table>
<thead>
<tr>
<th>Contact</th>
<th>Phone Number</th>
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<tr>
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In case of a crisis involving IDOT facilities and the surrounding community, use the following information to stay updated on events:

IDOT Hotline (toll free): 1-xxx-xxx-xxx
IDOT Hotline (local): xxx-xxx-xxxx
Report an event: xxx-xxx-xxxx
Check IDOT status: www.idotdr.com
### Wisconsin Department of Transportation

<table>
<thead>
<tr>
<th></th>
<th>DOA Building maintenance</th>
<th>Capitol Police</th>
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</thead>
<tbody>
<tr>
<td>WORK</td>
<td>(608)</td>
<td></td>
</tr>
<tr>
<td>WORK/CELL</td>
<td>(608)</td>
<td></td>
</tr>
<tr>
<td>PERSONAL</td>
<td>(608)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>IT HELP DESK</th>
<th>(XXX)</th>
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</table>

For Official Use Only

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<table>
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<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>WORK</td>
<td>(606)</td>
</tr>
<tr>
<td>CELL</td>
<td></td>
</tr>
<tr>
<td>HOME</td>
<td></td>
</tr>
</tbody>
</table>

Emergency Contacts