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of Transportation

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Administration**

An Introduction to All-Hazards Preparedness for Transit Agencies



May 2010

**An Introduction to All-Hazards Preparedness
for Transit Agencies**

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**An Introduction to All-Hazards Preparedness
for Transit Agencies**

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13. ABSTRACT (Maximum 200 words) Prepared by the Federal Transit Administration's (FTA) Office of Safety and Security, <i>An Introduction to All-Hazards Preparedness for Transit Agencies</i> is part of FTA's technical assistant to transit agencies. All-hazards preparedness for transit agencies is a risk prioritization and management process to effectively allocate resources to continually reduce safety, security, and emergency management risks and to prevent, protect, control, and mitigate incidents and adverse events. This document provides transit agencies with an explanation, a high-level process, and illustrative examples for applying an all-hazards preparedness process that is consistent with the national guidance on all-hazards preparedness presented in the <i>National Preparedness Guidelines</i>.			
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Acronyms and Abbreviations

CCTV	closed-circuit television
CFR	Code of Federal Regulations
DHS	U.S. Department of Homeland Security
DOT	U.S. Department of Transportation
FTA	Federal Transit Administration
HSPD	Homeland Security Presidential Directive
NIMS	National Incident Management System
NPG	National Preparedness Guidelines
NRF	National Response Framework
NRP	National Response Plan
OMB	Office of Management and Budget
SCADA	Supervisory control and data acquisition
SSI	Sensitive security information
TCL	Target Capabilities List
TVA	threat and vulnerability assessment
Volpe Center	Volpe National Transportation Systems Center
WMD	weapons of mass destruction

1. Introduction

Over the past few years, the term “all-hazards” has appeared in a variety of contexts in many federal documents, including homeland security presidential directives, the *National Incident Management System* (NIMS), and the *National Preparedness Guidelines* (NPG). To date, none of these documents has provided a succinct definition for the term “all hazards” that is appropriate for transit agencies. Rather, the term has been used in the general context of planning and preparing for responses to security incidents, natural disasters, and other emergencies.

This resource document provides a definition and explanation of all-hazards preparedness for transit agencies that expands on, and is consistent with, the national guidance on all-hazards preparedness presented in the NPG. The expansion of all-hazards preparedness for transit agencies adds safety accidents and criminal activities to the list of emergencies to be considered. More importantly, it includes a higher-level analysis of the results of safety, security, and emergency management assessments to prioritize actions for the integrated and comprehensive control of risks.

Definition. All-hazards preparedness for transit agencies is defined as integrated planning and capability building for safety, security, and emergency management to optimize and continuously improve the use of resources and the management of risks from hazards, threats, vulnerabilities, and adverse events or incidents.

The following documents provide the basis for this discussion of all-hazards preparedness:

- *Hazard Analysis Guidelines for Transit Projects*. Federal Transit Administration. 2000.
- *The Public Transportation System Security and Emergency Preparedness Planning Guide*. Federal Transit Administration. 2003.
- *National Incident Management System*. U.S. Department of Homeland Security. 2008.

Because terms in these three documents differ slightly in their meanings and applications, Appendix A contains definitions of some of the more important terms related to safety, security, emergency management, and all-hazards and identifies the basis documents from which they were taken.

Document organization. This document has five sections, a list of references, and two appendices. Section 2 provides the foundation and background that led FTA to develop this resource document for transit agencies. Section 3 presents an all-hazards preparedness model specifically tailored for managing safety and security risks to transit agencies. Section 4 presents examples of the application of all-hazards preparedness, and Section 5 summarizes potential benefits from its application.

The reference list includes requirements and resource documents published by federal agencies. Appendix A is a glossary of terms related to all-hazards preparedness, as described above. Appendix B provides a table of emergencies and other events that might affect transit agencies.

2. Background

Originally used by the National Weather Service in reference to its radio emergency warning system, the term “all-hazards” has, in the last several years, gained wide use in national security and emergency response documents.

In Homeland Security Presidential Directive (HSPD)-5 (February 2003), the President directed development of a new national response plan to align federal coordination structures, capabilities, and resources into a unified, all discipline, and all-hazards approach to domestic incident management. The resulting *National Response Plan* (NRP) was unique and far reaching in that it, for the first time, tied together a spectrum of incident management activities to include the prevention of, preparedness for, response to, and recovery from terrorism, major natural disasters, and other major emergencies.

In December 2003, HSPD-8, “National Preparedness,” used the term “all hazards” to require establishing

“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.”

Following Hurricane Katrina, in September 2007, the U.S. Department of Homeland Security (DHS) published the *National Preparedness Guidelines* (NPG) and the *Target Capabilities List: A Companion to the National Preparedness Guidelines* (TCL). The TCL included an all-hazards preparedness cycle, as shown in Figure 1.

In January 2008, DHS introduced the *National Response Framework* (NRF) as the successor to the NRP. The NRF is “a guide to how the Nation conducts all-hazards response.” In December 2008, DHS updated the NIMS to define an all-hazards incident as “an incident, natural or manmade, that warrants action to protect life, property, environment, and public health or safety, and to minimize disruptions of government, social, or economic activities.” Like the NRF, NIMS is directed toward national emergency response and emergency response organizations and agencies.

This resource document defines and presents an all-hazards preparedness model that is consistent with these national response documents, and is intended specifically for transit agencies.

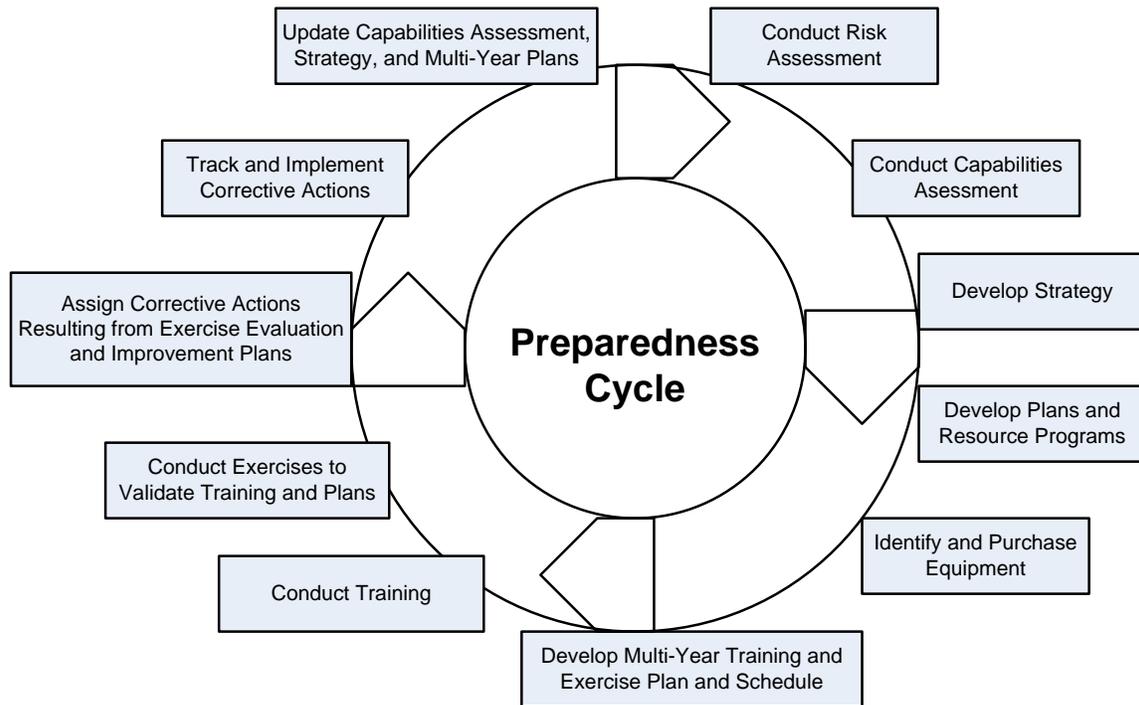


Figure 1. The *National Preparedness Guidelines* and the *Target Capabilities List* provided the framework for all-hazards preparedness and support the national implementation of the preparedness cycle.¹

3. All-Hazards Prioritization

Transit agencies routinely perform hazards analyses on their systems and processes to identify safety risks. Similarly, they perform threat and vulnerability assessments (TVAs) to identify security risks, and they perform capabilities assessments to better understand their resources and abilities to respond to emergencies. These three assessments are often conducted independently, in different departments or by different staff. Their results, typically in the form of rank-ordered lists of risks and mitigations, are then addressed separately, and resources allocated to eliminate or mitigate the risks.

All hazards preparedness includes an integration and prioritization process whereby the risks and mitigations identified in hazards analyses, TVAs, and capabilities assessments are considered simultaneously to facilitate the effective application of resources to reduce all risks. That is, as defined herein, and as shown in Figures 2 and 3, all-hazards preparedness for transit agencies includes an integrated risk evaluation and prioritization process that:

- Addresses safety, security, and emergency management risks simultaneously
- Facilitates the effective application of resources to reduce those risks.

¹ Adapted from *Target Capabilities List: A Companion to the National Preparedness Guidelines*, U.S. Department of Homeland Security, September 2007

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All-hazards preparedness. All-hazards preparedness is a holistic method for managing safety, security, and emergency management risks. The all-hazards preparedness process provides an opportunity for transit management to evaluate identified safety, security, and emergency management risks and mitigations simultaneously.

Figure 2 shows the all-hazards preparedness process for transit agencies. Although simplified, the process is consistent both with the emergency preparedness planning process traditionally used by transit agencies and with the TCL preparedness cycle shown in Figure 1.

The “build capability” box in Figure 2 includes:

- Stockpiling equipment and supplies
- Upgrading and protecting rolling stock, equipment, systems and other infrastructure
- Updating policies and procedures
- Training staff
- Conducting regional drills and table-top exercises
- Implementing other changes to protect, control, or mitigate risks.

The “correct/improve” box in Figure 2 includes the immediate and short-term implementation of corrective and preventive actions that result from lessons learned during drills and exercises, oversight and self-assessment findings, and accident and incident investigations.

The “evaluate” box in Figure 2 has embedded in it three assessments (i.e., hazard analyses, TVAs, and capabilities assessments) that transit agencies may use to identify safety, security, and emergency management risks, respectively. The results of these assessments are the input for the all-hazards risk evaluation and prioritization shown in Figure 3.

The “respond” and “recovery” boxes in Figure 2 show response to and recovery from natural, human-caused, or even planned events that significantly impact transit operations (see Appendix B table). Although response and recovery are not part of preparedness, they are critical to all-hazards preparedness because lessons learned from real events and incidents contribute to corrective actions as well as to evaluations and more informed planning to continually improve preparedness.

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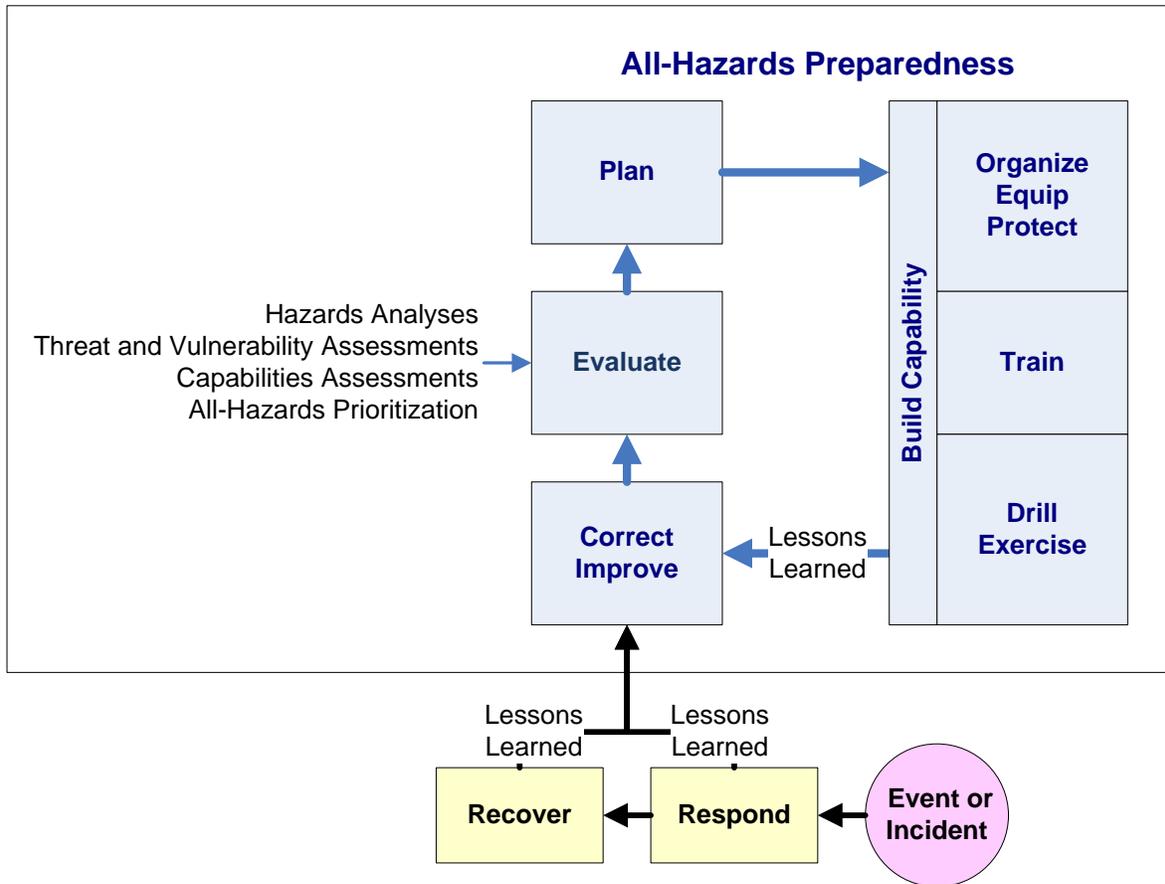


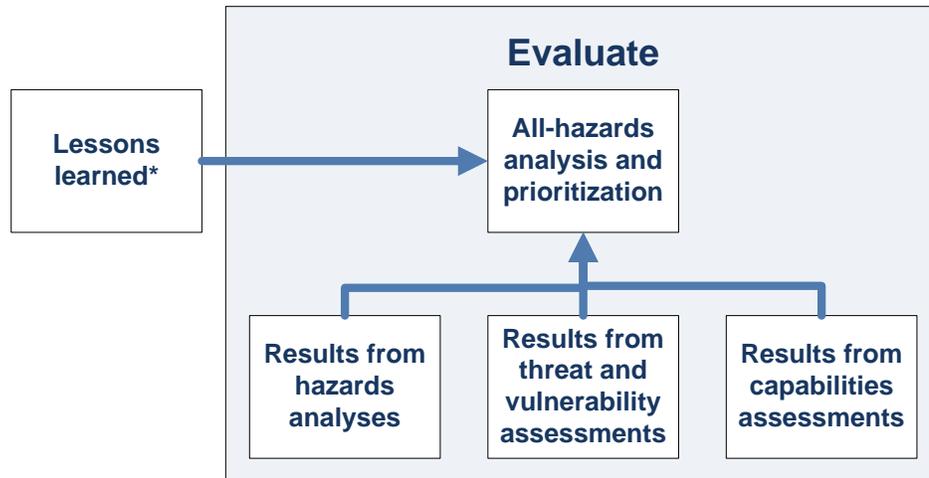
Figure 2. All-hazards preparedness for transit agencies is a process to effectively apply resources to continually reduce safety, security, and emergency management risks.

All-hazards prioritization. As part of transit evaluation and planning, transit agencies refine their risk management strategies and make risk decisions using several assessment tools, including hazard analyses for safety, TVAs for security, and capabilities assessments for emergency response and recovery. Each of these assessments typically results in a ranked list of risks to the transit agencies. As shown in Figure 3, all-hazards preparedness uses a higher-level analysis to review the risks identified in the hazard analyses, TVAs, and capabilities assessments simultaneously and to develop a single, integrated prioritization of these risks.

The higher-level all-hazards analysis and prioritization shown in Figure 3 is a process internal to transit agencies. It is executed by safety, security, emergency management, and other agency managers and senior executives, as appropriate,² using the results of their hazards analyses, TVAs, and capabilities assessments, including cyber (computer) security and sensitive security information (SSI).³

² In smaller transit agencies, a single individual or position may be responsible for more than one of these management functions.

³ Because all-hazards evaluations are internal to transit agencies, SSI is controlled among agency personnel with a need to know. Only outcomes are shared, again, on a need-to-know basis.



* Lessons learned from recent accident investigations, drills and exercises, self-assessments, etc.

Figure 3. All-hazards preparedness for transit agencies uses a higher-level analysis to create an integrated prioritization of risks identified in the agencies' hazard analyses, TVAs, and capabilities assessments.

Similar risks ranked in more than one type of assessment may alert transit agencies to raise the priorities of these risks (see Example 1). By raising the priorities, transit agencies can effectively apply resources to build capability and reduce the risks. Conversely, if proposed risk mitigations from different assessments conflict with one another, transit agencies can develop strategies to adequately address them simultaneously (see Example 2).

Transit agencies should continually evaluate the priority assignment of risks. Agencies may reassign risk priorities at any time based on such factors as results of recent accident and incident investigations, lessons learned from drills and exercises, or findings from audits and self-assessments.

Because risk decisions and actions occur before, and sometimes in preparation for, emergency events, all-hazards planning and preparedness addresses planning and preparing for these events, but does not include actual response to and recovery from them. During response and recovery, actions are based on implementing the plans and deploying the resources amassed as part of planning and preparation, respectively. However, safety, security, and emergency management functions remain responsible for oversight during response and recovery as well as for investigating causes and documenting lessons learned for use in future evaluations and planning.

4. Examples

The three examples below illustrate the potential benefits of all-hazards preparedness. The advantage of using the all-hazards process is that synergies, conflicts, and complexities can be recognized and addressed early in the planning process.

Example 1. Synergy – Closed-circuit television. Safety, security, and emergency management risk assessments often identify the same isolated locations (e.g., underground rail platforms) for mitigation through active surveillance using closed-circuit television (CCTV). When all three risk assessments identify the same risk mitigation strategy, then implementation of the mitigation

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should receive priority. In addition, the design and installation of the CCTV equipment as well as its operation, should consider the needs of safety, security, and emergency management.

Example 2. Conflict – Emergency exit doors. Security departments at transit agencies prefer to have access control (e.g., locks) for emergency exit doors. Safety departments call for complete and unimpeded access to these doors for egress in emergency evacuations. Depending on the criticality of safety and security needs, several compromises are possible. Emergency exit doors must not be locked, but should be accessible from only one side—the side requiring evacuation. In addition, emergency exit doors may need monitoring to assure that they are not left open. If emergency exit doors are at critical access points (e.g., separating passenger platforms from uncontrolled public locations), the doors may need CCTV surveillance, alarms to warn of the doors being opened, and procedures requiring a response to every alarm.

Example 3. Complexity – Incident response planning and investigation. The all-hazards process is useful for planning for emergency response to all incidents regardless of cause – human error or intent, equipment malfunction, or natural phenomenon – because the response to a given type of transit incident (e.g., vehicle accident, fire) is generally the same. For example, when a train platform or train is evacuated because of smoke, transit operations employees or security personnel normally lead the emergency evacuation. When emergency responders arrive on-scene, they take over the lead. If the smoke was caused by a person trying to create panic, then the investigational lead transitions to the security department. If the smoke was caused by equipment malfunction, the lead transitions to the safety and operations departments. If the incident resulted from a lightning strike, for example, emergency responders retain the lead. All-hazards preparedness helps to make these transitions obvious and apparent well in advance of their implementation and, thus, to reduce “on scene” and follow-up confusion after an accident or incident.

5. Benefits

All-hazards preparedness affords multiple benefits to transit agencies:

- **Increased communication and coordination.** Safety, security, and emergency management functions share critical information to address all risks simultaneously.
- **Increased efficiency and cost effectiveness.** Safety, security, and emergency management functions are better coordinated to promote synergistic, efficient, and cost-effective capability building.
- **Increased flexibility and resiliency.** Resiliency in responding to safety, security, and other emergency incidents increases.

All-hazards preparedness provides transit agencies with a comprehensive overview of their risks. It provides a method to simultaneously compare and evaluate risks to:

- Recognize similarities among risks identified in hazard analyses, TVAs, and capabilities assessments
- Elevate the priority of multi-dimensional risks and pool resources to reduce them
- Recognize and reduce conflict among risk management decisions for safety, security, and emergency management
- Plan more effectively for response to all emergencies, regardless of cause.

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Appendix A

Glossary

Appendix A: Glossary

The definitions used in this resource document were taken from three sources:

- *National Incident Management System*. December 2008. Department of Homeland Security. **NIMS**
- *Hazard Analysis Guidelines for Transit Projects*. January 2000. Federal Transit Administration. DOT-FTA-MA-26-5005-00-01. DOT-VNTSC-FTA-00-01. **HAG**
- *The Public Transportation System Security and Emergency Preparedness Planning Guide*. January 2003. Federal Transit Administration. DOT-FTA-MA-26-5019-03-01. DOT-VNTSC-FTA-03-01. **SSEPP**

All-Hazards: Describing an incident, natural or manmade, that warrants action to protect life, property, environment, and public health or safety, and to minimize disruptions of government, social, or economic activities. **NIMS**

Assessment: The process of acquiring, collecting, processing, examining, analyzing, evaluating, monitoring, and interpreting the data, information, evidence, objects, measurements, images, sound, etc., whether tangible or intangible, to provide a basis for decision making. **NIMS**

Capabilities Assessment: A formal evaluation, conducted by the public transportation system, to identify the status of its security and emergency preparedness activities. **SSEPP**

Continuity of Operations: An effort within individual organizations to ensure that primary mission essential functions continue to be performed during a wide range of emergencies. **NIMS**

Emergency: A situation which is life threatening to passengers, employees, or other citizens, or which causes significant damage to any transit vehicle or facility that require assessment and repair, or which reduces the ability of the system to fulfill its mission within its service area. **SSEPP**

Emergency Preparedness: A uniform basis for operating policies and procedures for mobilizing public transportation system and other public safety resources to assure rapid, controlled, and predictable responses to various types of transportation and community emergencies. **SSEPP**

Hazard: Something that is potentially dangerous or harmful, often the root cause of an unwanted outcome. **NIMS**

Hazard: Any real or potential condition that can cause injury, death, or damage to or loss of equipment or property. **HAG**

Hazard Analysis: Any analysis performed to identify hazardous conditions for the purpose of their elimination or control. **HAG**

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Incident: An occurrence, natural or manmade, that requires a response to protect life or property. Incidents can, for example, include major disasters, emergencies, terrorist attacks, terrorist threats, civil unrest, wild-land 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**

Mitigation: Activities providing a critical foundation in the effort to reduce the loss of life and property from natural and/or manmade disasters by avoiding or lessening the impact of a disaster and providing value to the public by creating safer communities. Mitigation seeks to fix the cycle of disaster damage, reconstruction, and repeated damage. These activities or actions, in most cases, will have a long-term sustained effect. **NIMS**

National Incident Management System: A set of principles that provides a systematic, proactive approach guiding government agencies at all levels, nongovernmental organizations, and the private sector to work seamlessly to prevent, protect against, respond to, recover from, and mitigate the effects of incidents, regardless of cause, size, location, or complexity, in order to reduce the loss of life or property and harm to the environment. **NIMS**

National Response Framework: A guide to how the United States conducts all-hazards response. **NIMS**

Organization: Any association or group of persons with like objectives. Examples include, but are not limited to, governmental departments and agencies, nongovernmental organizations, and the private sector. **NIMS**

Planned Event: A scheduled non-emergency activity (e.g., sporting event, concert, parade). **NIMS**

Preparedness: A continuous cycle of planning, organizing, training, equipping, exercising, evaluating, and taking corrective action in an effort to ensure effective coordination during incident response. Within the *National Incident Management System*, preparedness focuses on the following elements: planning; procedures and protocols; training and exercises; personnel qualification and certification; and equipment certification. **NIMS**

Preparedness: The range of deliberate, critical tasks and activities necessary to build, sustain, and improve the operational capability to prevent, protect against, respond to, and recover from domestic incidents. Preparedness is a continuous process. **NIMS**

Prevention: Actions to avoid an incident or to intervene to stop an incident from occurring. Prevention involves actions to protect lives and property. It involves applying intelligence and other information to a range of activities that may include such countermeasures as deterrence operations; heightened inspections; improved surveillance and security operations; investigations to determine the full nature and source of the threat; public health and agricultural surveillance and testing processes; immunizations, isolation, or quarantine; and, as appropriate, specific law

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enforcement operations aimed at deterring, preempting, interdicting, or disrupting illegal activity and apprehending potential perpetrators and bringing them to justice. **NIMS**

Protocol: A set of established guidelines for actions (which may be designated by individuals, teams, functions, or capabilities) under various specified conditions. **NIMS**

Recovery: The development, coordination, and execution of service- and site-restoration plans; the reconstitution of government operations and services; individual, private-sector, nongovernmental, and public assistance programs to provide housing and to promote restoration; long-term care and treatment of affected persons; additional measures for social, political, environmental, and economic restoration; evaluation of the incident to identify lessons learned; post-incident reporting; and development of initiatives to mitigate the effects of future incidents. **NIMS**

Resources: Personnel and major items of equipment, supplies, and facilities available or potentially available for assignment to incident operations and for which status is maintained. Resources are described by kind and type and may be used in operational support or supervisory capacities at an incident or at an Emergency Operations Center. **NIMS**

Response: Activities that address the short-term, direct effects of an incident. Response includes immediate actions to save lives, protect property, and meet basic human needs. Response also includes the execution of emergency operations plans and of mitigation activities designed to limit the loss of life, personal injury, property damage, and other unfavorable outcomes. As indicated by the situation, response activities include applying intelligence and other information to lessen the effects or consequences of an incident; increased security operations; continuing investigations into nature and source of the threat; ongoing public health and agricultural surveillance and testing processes; immunizations, isolation, or quarantine; and specific law enforcement operations aimed at preempting, interdicting, or disrupting illegal activity, and apprehending actual perpetrators and bringing them to justice. **NIMS**

Risk: An expression of possible loss over a specific period of time or number of operational cycles. It may be expressed as the product of hazard severity and probability. **HAG**

Safety: Freedom from danger. **SSEPP**

Security: Freedom from intentional danger. **SSEPP**

Standard Operating Procedure: A complete reference document or an operations manual that provides the purpose, authorities, duration, and details for the preferred method of performing a single function or a number of interrelated functions in a uniform manner. **NIMS**

System: Any combination of facilities, equipment, personnel, processes, procedures, and communications integrated for a specific purpose. **NIMS**

System: A composite of personnel, procedures, materials, tools, equipment, facilities, and software, at any level of complexity. The elements of this entity are used together in the intended

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operational or support environment to perform a given task or achieve a specific production, support, or mission requirement. **HAG**

System: A composite of people (employees, passengers, others), property (facilities and equipment), environment (physical, social, institutional), and procedures (standard operating, emergency operating, and training), which are integrated to perform a specific operational function in a specific environment. **SSEPP**

Terrorism: As defined in the Homeland Security Act of 2002, activity that involves an act that is dangerous to human life or potentially destructive of critical infrastructure or key resources; is a violation of the criminal laws of the United States or of any State or other subdivision of the United States; and appears to be intended to intimidate or coerce a civilian population, to influence the policy of a government by intimidation or coercion, or to affect the conduct of a government by mass destruction, assassination, or kidnapping. **NIMS**

Threat: Natural or manmade occurrence, individual, entity, or action that has or indicates the potential to harm life, information, operations, the environment, and/or property. **NIMS**

Threat: Any action with the potential to cause harm in the form of death, injury, destruction, disclosure, interruption of operations, or denial of services. **SSEPP**

Threat Analysis: An analysis to define the level or degree of the threats against a facility by evaluating the intent, motivation, and possible tactics of those who may carry them out. **SSEPP**

Threat and Vulnerability Assessment: An evaluation performed to consider the likelihood that a specific threat will endanger the system, and to prepare recommendations for the elimination or mitigation of all threats with attendant vulnerabilities that meet pre-determined thresholds. **SSEPP**

Tools: Those instruments and capabilities that allow for the professional performance of tasks, such as information systems, agreements, doctrine, capabilities, and legislative authorities. **NIMS**

Vulnerability: Anything that can be taken advantage of to carry out a threat. **SSEPP**

Vulnerability Analysis: The systematic identification of physical, operational and structural components within transportation facilities and vehicles that can be taken advantage of to carry out a threat. **SSEPP**

Appendix B
Events Affecting Transit Agencies

Appendix B: Events Affecting Transit Agencies

Naturally Occurring	Human-Caused	
	Intentional	Unintentional
Droughts	Terrorist or criminal threats, e.g., bomb	Accidents (transportation)
Dust/wind storms	Terrorist assaults or criminal violence	Contaminations
Earthquakes	Disruption of supply sources	Damage/destruction of assets
Electrical storms	Fire/arson	Gas outages
Epidemics	Fraud/embezzlement	Hardware failure/malfunction
Floods	Labor disputes/strikes	Hazardous material spills
High winds	Misuse of resources	Human errors
Hurricanes/typhoons	Riot/civil disorder	HVAC system failures
Ice storms	Sabotage	Inappropriate training
Landslides	Security breaches	Key personnel absence
Snowstorms/blizzards	Sports events or parades	Power outages
Tornadoes	Supervisory control and data acquisition (SCADA) breaches or other computer/ electronic sabotage	Power supply failure
Tropical storms	Theft	Software failure/malfunction
Tsunamis	Vandalism	Telecommunications failures
Wildfires	Workplace violence	Water outages

Adapted from Table 1 of Transit Cooperative Research Program (TCRP) Report 86, Transportation Security, Volume 9, *Guidelines for Transportation Emergency Training Exercises*. May 2006.