Emergency Preparedness for Transit *Terrorism*

ANNABELLE BOYD AND JOHN P. SULLIVAN

Annabelle Boyd is Principal, Boyd, Maier & Associates, Barboursville, Virginia; and John P. Sullivan is Sergeant, Los Angeles Sheriff's Department, Los Angeles, California.

A primary mission of every transit agency is to ensure, to the extent possible, the security of passengers, employees, and agency property. Each year, U.S. public transportation systems carry more than 8 billion passengers and employ almost 300,000 people. The U.S. public transportation infrastructure—including subways, light rail and trolley systems, bus agencies, ferries, and commuter and passenger railroad services—is now valued at more than a trillion dollars.

Transit police and security and operations personnel, in cooperation with local law enforcement agencies, employ a variety of security programs to protect transportation agencies, their customers, and employees. Collectively, these programs have been quite effective in reducing violent crime and improving customer perceptions of security. Now, however, these programs, designed to address traditional security concerns, must deal with the emerging threat of transit terrorism.

Definitions

Since the word *terrorism* was first used to describe the Jacobin excesses of the French Revolution, it has come to denote a wide range of actions and motivations around the world. Specific definitions of the term vary, but they share the notion that terrorism is a form of intimidation designed to influence an audience beyond its immediate victims. The goal of terrorism goes beyond the impact of an act of violence on the intended target to encompass the psychological impact of the violence on citizens and politicians.

To ensure that such acts are appropriately identified and investigated, the Federal Bureau of Investigation has been given jurisdiction over terrorism in the United States. The FBI defines terrorism as "the unlawful use of force or violence, committed by a group(s) of two or more individuals, against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives." According to this definition, an incident must have three features to be considered an act of terrorism:

- *Motivation*—a clear political or social agenda
- *Perpetrators*—a conspiratorial dimension
- *Means*—the use of force or violence

As a result of the limited scope of this definition, FBI statistics indicate low levels of terrorist activity in the United States (between 1990 and 1998, approximately 50 incidents meeting the definition were reported). Others who must deal with the consequences of terrorist activity believe many violent acts excluded by this definition should be included. For example, the Bureau of Alcohol, Tobacco and Firearms reports that more than 2,500 criminal bombings have occurred in the United States each year since 1990. The BATF statistics include many events, such as the Fulton Street firebombing on the New York City subway, not considered terrorist acts under the FBI definition. Likewise, many transit organizations take into account a broader range of acts, more applicable to the transit environment, in conducting terrorism planning and response activities. They generally consider both acts of terrorism

Bus and rail systems are increasingly becoming targets for terrorists worldwide. The release of sarin gas in the Tokyo subway system in 1995 is an example of this trend.

according to the FBI definition and acts of *quasi-terrorism*. The latter acts have the following features:

- *Motivation*—a clear *criminal*, *ideological*, political, social, or *religious* agenda
- *Perpetrators*—act committed by *one* or more persons
- *Means*—the use of force or violence *or the threat of force or violence*

This broader definition of terrorism is used throughout the discussion that follows.

Changing Nature of the Threat

Terrorism is becoming increasingly lethal throughout the world as a wide variety of groups seeking to influence political and social discourse embrace escalating levels of violence. The bombings in Kenya and Tanzania and those in Oklahoma City and the World Trade Center, the release of sarin gas in the Tokyo subway system, and the recent conviction of Ramsi Yousef for attempting to blow up dozens of U.S. jets simultaneously are but examples of this trend. The credible threat of increasing violence necessitates a dramatic change in levels of preparedness.

In public transportation, the changing terrorist threat is best observed through the following four trends:

- While there are fewer individual acts of terrorism, those that occur are producing growing numbers of casualties. This trend is evidenced by bombings of transportation targets that have taken place in India, France, Israel, and Colombia, as reported by the U.S. State Department (*1*). Individual incidents, while occurring in lesser numbers, are more violent than ever before.
- Assessments prepared by the U.S. intelligence community indicate both the increasing attractiveness of transit as a target and the growing number of incidents committed against rail and bus systems worldwide. According to the U.S. State Department, the number of violent attacks against transportation targets increased from 20 percent of all violent attacks in 1991 to nearly 40 percent in 1998.
- A growing number of terrorist groups appear no longer to be constrained by traditional state sponsors or subnational groups. New motivations, which do not include an overriding concern for public support, are eroding restraint and increasing the violence associated with terrorist attacks.
- With the release of sarin gas in Tokyo in March 1995, the chemical, biological, and nuclear threshold was crossed. Weapons of mass destruction now appear to be within the grasp of those willing to use them.

While U.S. transit systems have thus far not been the focus of political terrorism, they have been the targets of terrorist acts. Examples are the "Mad Bomber" campaign of 1940 to 1956, which was focused on transit and other infrastructure targets in New York City, and the Fulton Street firebombing on the New York City subway in 1994. On July 30, 1997, 300,000 commuters were stalled as police rerouted trains that normally passed under the Brooklyn apartment of a trio of suicide bombers. The

bombers were planning to attack the Atlantic Avenue terminus of the Long Island Rail Road (LIRR), as well as New York City subway and bus targets. The February 26, 1993, World Trade Center bombing, though not a transit-directed attack, impacted operations on both the New York City subway and the bistate PATH commuter railway, resulting in significant damage to PATH's lower Manhattan terminus at the World Trade Center. The October 9, 1995, sabotage-induced derailment of Amtrak's *Sunset Limited* killed 1 person and injured 65 others. The most violent transit-related terrorist event occurred on December 7, 1993, when Colin Ferguson, a lone gunman, killed 6 and injured 17 in an armed assault on an LIRR rush-hour train.

Survey of Transit Organizations

The Transportation Research Board recently conducted a survey designed to capture information from a wide range of public transportation systems on their preparedness for terrorist acts. This survey was administered to 60 agencies that fell into four categories:

- Domestic rail and bus systems (operating one or both modes)
- Domestic commuter rail agencies (operating exclusively commuter rail)
- Domestic ferry systems
- International systems (responses received from Canadian systems only)

The full survey results are presented in the TRB synthesis *Emergency Preparedness for Transit Terrorism* (2).

Survey respondents indicated that their greatest concern for the next 5 years is being able to identify and prevent the possible detonation of explosive devices on their systems. Additional concerns include vehicle hijacking, hostage/barricade situations, and shootings with multiple victims. While most respondents acknowledged the importance of chemical, biological, and nuclear threats against their systems, these are perceived as less immediate threats than those resulting from more traditional forms of terrorism or extreme violence involving explosives and firearms. Attacks involving electronic warfare, such as virtual terrorism or breeches of essential computer networks, are perceived as least likely to occur during the next 5 years. Groups that pose terrorist threats in the states represented by the respondents include:

- Right wing (for example, antifederalist, racist, anti-Semitic, tax-resisting)
- Left wing (for example, revolutionary, Marxist–Leninist)
- International (for example, foreign groups or groups sponsored by foreign governments)
- Ethnic/émigré
- Issue-specific (for example, animal rights, environmental, anti-abortion)

Local law enforcement and transit police and operations personnel responding to the survey generally believe urban rail, commuter rail, and bus and rail terminals are at greatest risk of being targeted in a terrorist event. Bridges and tunnels are perceived to be slightly less at risk. Bus vehicles and ferries are considered the least likely targets for terrorist activities.

All transit agencies reported a shared responsibility for prevention of and response to terrorism. Development of the plans, policies, and procedures that constitute system counter- and antiterrorism programs is carried out with the involvement of local law enforcement; transit police; security personnel; safety departments; and transit agency personnel in operations, maintenance, procurement, and administration. In addition, many transit agencies surveyed rely on a significant level of support from state law enforcement and state and local emergency management agencies, as well as federal agencies such as the FBI and BATF. For example, transit agencies receive training, resource materials, handbooks, literature, assistance with emergency response planning, technical expertise, and intelligence from outside agencies.

Coping with the Threat

Dispelling the commonly held perception that terrorism is a remote possibility, 29 percent of the survey respondents reported participating in a terrorist-related investigation within the past 5 years. Eighty-eight percent of respondents had experienced bomb threats, and 26 percent had dealt with a hostage/barricade situation. In addition, 71 percent of respondents provide service in states with at least one identified terrorist group, and 33 percent of agencies have determined one or more such groups operate in their service area. These results indicate that transit agencies, transit police, and local law enforcement agencies in the United States may indeed find themselves coping with the consequences of a terrorist incident. Thus there is a clear need for improved planning capabilities to combat terrorism in the transit environment.

Planning for transit terrorism involves the identification of resources and methods required to mitigate the impacts of such acts. The process includes assessing actual capabilities and then, through coordinated planning, determining their best strategic application to the problem. This planning has two goals:

♦ *Terrorism mitigation*—includes system design and physical security measures to enhance observation and deter criminal activity; police patrol and surveillance; coordination with operations and maintenance personnel to identify and resolve security threats; and communication and coordination with local, state, and federal law enforcement agencies to obtain terrorism intelligence, training, and technical support.

♦ *Terrorism response*—includes the development of plans and procedures for minimizing the potential danger to passengers and emergency responders during incidents, and maximizing the effectiveness of transit system and other agency personnel in managing a critical incident. A series of training bulletins on bomb threat response produced by the Chicago Police Department serves as a good example of an agency's plans and procedures for dealing with an incident (*3*).

Development and implementation of a new system for coping solely with terrorist incidents would result in confusion and would not provide the organizational cohesiveness necessary to manage a major incident. The most effective way to develop an integrated system for minimizing injuries and deaths due to terrorist acts is to build on existing emergency response capabilities. An example is the approach adopted by Houston Metro, which recently conducted a terrorism response training exercise with U.S. DOT. This exercise involved local, state, and federal emergency responders in a test of the agency's emergency management capabilities.

Figure 1, prepared to direct response to the release of a chemical agent in the transit environment, illustrates an integrated response to transit terrorism. To achieve this level of response capability, transit agencies are performing the following activities.

Assessments

Enhanced emergency response begins with a transit agency's assessment of the existing risks and subsequent decisions about the appropriate resources to invest in preparedness and mitigation capabilities.

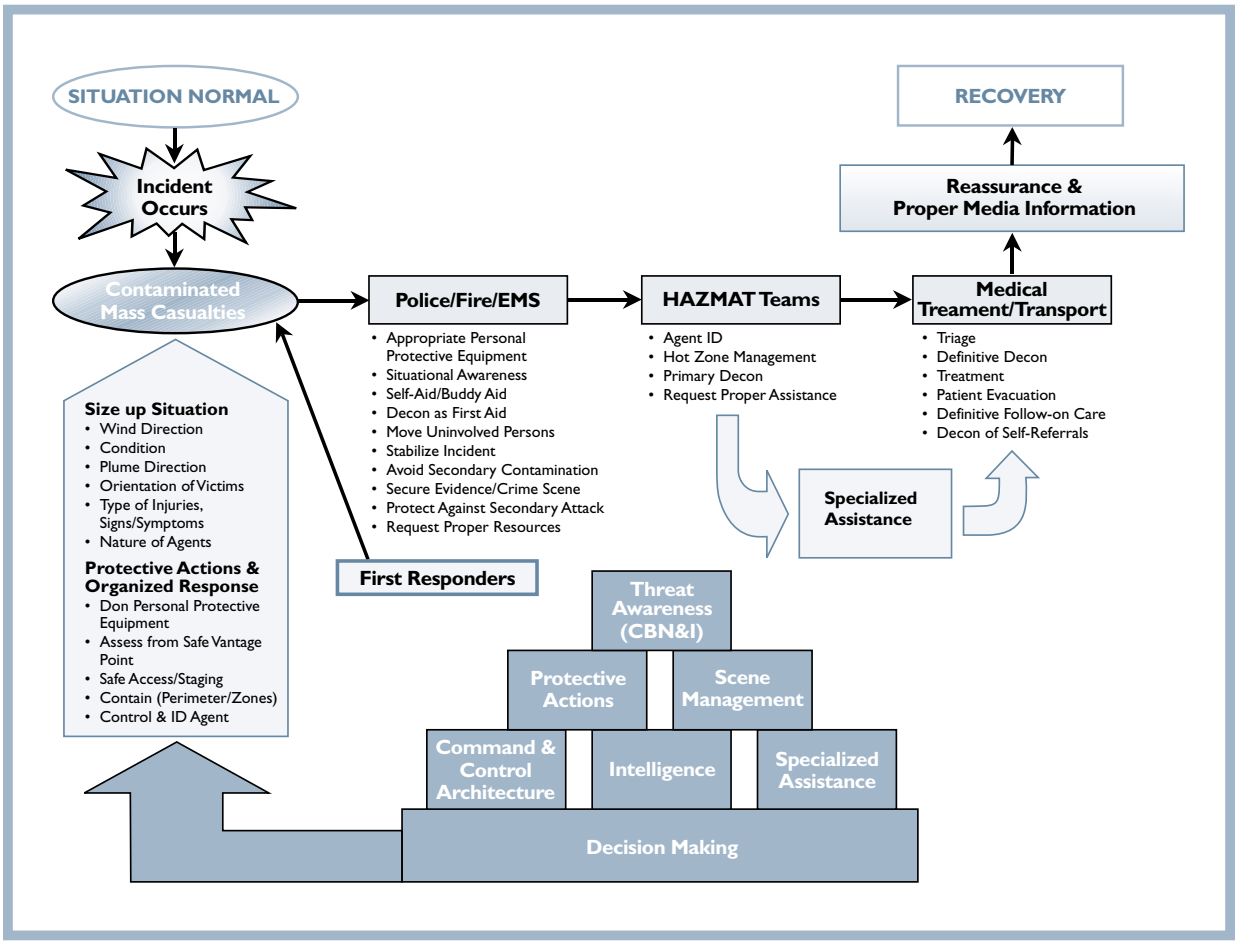

FIGURE 1 Response to a chemical agent release in the transit environment.

This process has three steps:

1. Perform risk assessment
2. Identify hazard severity and probability
3. Resolve identified risks and hazards

A risk assessment is a comprehensive study of a system that involves identifying those components most vulnerable to disruption or destruction and assessing the likely impact of such disruption or destruction on passengers, employees, and the system. The results of the assessment aid transit officials in making crucial decisions about the deployment of available resources. In making these decisions, transit agencies must take into account which facilities and technologies are critical to the effective operation of the system. Indeed, a common approach to conducting a risk assessment is to assign values to facilities based on their criticality to transit system operations. Table 1 shows a five-level risk classification system used by many transit agencies.

TABLE 1 Risk Levels for Transit Facilities

RISK LEVEL	DEFINITION
1	Facilities whose loss or damage would have a major financial impact or result in the extended interruption of critical services
2	Facilities containing items of physical value, confidential information, or computer access to sensitive data/operational processing networks
3	Facilities whose disruption would be moderately serious
4	Facilities relatively unimportant to operations
5	Criticality cannot be assessed

The interrelationships between vulnerabilities and critical functions must be understood and addressed carefully during the risk assessment. Table 2 depicts a risk assessment performed by the U.S. General Accounting Office (GAO) for the rail transit environment. The criticality of each rail transit component was determined according to the impact of its disruption on people (either the public or employees) and the transit system itself. Similar assessments can be valuable for other modes.

Risk assessments are strengthened by the monitoring of terrorist activity worldwide, which assists in evaluating the potential impact of such activity in a given area of operations. The most useful framework for this purpose involves assessment of two distinct elements:

- Trends and potentials
- Capabilities and intentions

Monitoring of trends and potentials supports planning and training and can form the foundation of an indication and warning capability. Assessment of capabilities (determining whether a specific group could carry out an attack) and intentions (understanding the group's objectives) is a traditional criminal intelligence (law enforcement) function.

Emergency Plans

Effective response to an act of terrorism requires sound decision making in a chaotic and emotionally charged environment, a capability that can be achieved only through emergency planning and training. Bay Area Rapid Transit (BART) in San Francisco, New York City Transit (NYCT), and the Washington Metropolitan Area Transit Authority (WMATA) are examples of transit agencies that have developed emergency plans in which response to terrorist incidents is addressed.

Some transit agencies have developed incident response plans specifically for acts of terrorism. Other agencies use a general emergency plan designed to direct system response to a broad range of emergency situations (e.g., fires, floods, earthquakes, blizzards, derailments, power outages); these plans, to varying degrees, can also be used to guide response to a terrorist incident. Most plans also include local public safety agencies.

In general, emergency plans used in the transit environment provide guidance for reporting and evaluating the incident, using the incident command system, notifying emergency response personnel/agencies, protecting personnel and equipment at the incident site, dispatching emergency response personnel and equipment to the site, evacuating passengers, providing briefings and information updates, managing the emergency, and restoring the system to normal.

A key goal of these plans is to establish unified command with local responders. Unified command allows all agencies with jurisdictional, legal, or functional responsibility to formulate a common set of objectives and strategies and a single plan for action. Through unified command, the transit agency can work with local police, fire, and emergency services personnel to ensure that:

- A single set of objectives is developed for the entire incident.
- A collective approach is used to develop strategies for achieving incident response goals.
- Information flow and coordination are improved among all jurisdictions and agencies involved in the incident.
- All agencies with responsibility for the incident have an understanding of joint priorities and restrictions.
- No agency's authority or legal requirements are compromised or neglected.
- Each agency is fully aware of the plans, actions, and constraints of the others.
- The combined efforts of all agencies are optimized.
- Duplicate efforts are reduced or eliminated, thus decreasing cost, as well as chances for frustration and conflict.

Coordination with Other Agencies

Effective management of resources during an emergency must be guided by an enhanced command and control architecture. Transit agencies use an incident command system or similar incident management structure for organizing the response to emergencies (including terrorist events), disasters, and accidents. Many of these emergency management systems include procedures for incident notification, deployment of personnel to the scene, chain-of-command and interagency relations and communication, triage and treatment of casualties, and improved agency recovery of operations.

First envisioned as a tool for managing multiagency responses to wildland fires, the incident command system concept has been adapted successfully to a wide range of emergency and disaster management applications. An incident command system is required by federal law for response to situations involving hazardous materials and is the mandated incident management framework in California.

Many local police and fire departments use an incident command system to guide emergency response activities. Once transit agency personnel understand how the system operates, they can work effectively with public safety organizations to manage and support response efforts.

Incident command systems represent a departure from routine transit organizational structures, enabling the creation of a temporary emergency organization uniquely matched to the requirements of a given incident. The system allows transit police and operations personnel to work with other emergency responders to establish a common set of objectives and a single plan for managing the incident.

TABLE 2 Assessment of Risk and Vulnerability

Transit Components	Criticality (Level of Impact) People	Agency	Vulnerability
Stations	High[a]	High[b]	High
Rail			
Track	Low	High[b]	High
Cars	High[b]	Low	High
Maintenance Yards	Low	Medium	Medium
Switching Stations	Low	Medium	Medium
Electric Power			
Source for Agency	Medium	High	Medium
Substations	Low	Medium	Medium
Command Control Center	Low[c]	High	Medium
Revenue Collection Facilities	Low	Medium	Low
Bridges, Aerial and Tunnel Structures	Medium	Medium[b]	Medium
Fans, Vents, and Emergency Hatches	Low	Medium	Medium

[a] Depends on time of day incident occurs: greater impact would be experienced during rush hours than during off-peak periods.
[b] Depends on where incident occurs: an incident at a crossover or main junction would have greater impact than one at an outlying station or track segment.
[c] Affects employees only.

Perhaps the most important feature of such a system is its ability to be integrated into the command structure of local police and fire departments. In the event of a major critical incident involving a transit system, either local police or fire services may ultimately assume control of the scene. However, transit police and operations personnel will continue to play a vital role during emergency response. The incident command system keeps transit police and operations linked to the command structure, ready to assist and supply information and resources as needed.

The incident command system concept has been tried, proven, and highly refined since its inception. Its effectiveness as an emergency management approach is recognized throughout the United States. Large transit operators, such as BART, NYCT, and LIRR, organize all emergency activities so they are incorporated into an incident command system structure that serves as the basis for response to all incidents.

Technology

The transit community is actively soliciting technological assistance for the development and exploita-

continued on page 41

Emergency Preparedness for Transit Terrorism
continued from page 17

tion of anti- and counterterrorist technology. Among the technological advances that have the potential to benefit efforts against terrorism are portable stand-off detection systems. Such devices promise the ability to alert responders to the presence of chemical or biological agents and high explosives. Other technologies of interest include explosive detection devices, magnetometers, closed-circuit television systems with smart alarm systems, bomb blankets and bags, blast-resistant containers, ventilation systems, and personal protective equipment.

Conclusions

Transit personnel are increasingly assuming greater responsibility for activities designed to mitigate terrorism and improve associated emergency response capabilities. Many agencies have initiated system security programs to protect passengers, employees, and facilities from the most devastating consequences of a terrorist act. These programs focus on improved linkages to local, state, and federal law enforcement agencies; heightened awareness training; and the integration of terrorist response and consequence management skills into system emergency procedures. Through such programs, transit agencies can increase the possibility of preventing and deterring terrorist incidents; improve the effectiveness of the response should an incident occur; and maximize opportunities to organize and cooperate with local, state, and federal agencies, all of which have a role in combating terrorism.

Personal protective equipment required for clean up and decontamination of chemical release site.

References

1. *Annual Report*. U.S. DOT. Office of Intelligence and Security. Washington, D.C., March 2000.
2. TCRP Synthesis of Transit Practice 27, *Emergency Preparedness for Transit Terrorism*. TRB. National Research Council, Washington, D.C., 1997.
3. Chicago Police Department. *Training Bulletin*. Vol. 37, Nos. 3, 4, and 5, 1997.