Introduction

"HOMELAND SECURITY IS A CONCERTED NATIONAL EFFORT TO PREVENT TERRORIST ATTACKS WITHIN THE UNITED STATES, REDUCE AMERICA'S VULNERABILITY TO TERRORISM, AND MINIMIZE THE DAMAGE AND RECOVER FROM THE ATTACKS THAT DO OCCUR." — THE NATIONAL STRATEGY FOR HOMELAND SECURITY*

The transportation sector contains a virtually unlimited number of components and activities that might become targets of terrorist attacks, or could be used by terrorists to enable a broader attack on people, property, or the functioning of the U.S. economy. Preventing or minimizing the great harm caused by such attacks can be thought of in three stages. The first is assessment of the risks faced by the transportation system: the nature of the threats; identification of vulnerabilities of transportation infrastructure, vehicles, and operational practices; and the magnitude and nature of potential consequences.

Given the magnitude of the task, resources available for security improvements will inevitably be limited. It will be difficult or even impossible to implement security-related operational and procedural changes if they are too expensive or if they compromise system availability and performance. Priorities must be established to guide decisions concerning alternative investment, programmatic, and policy countermeasures. Thus, an important element in achieving a secure transportation system is characterizing alternative tactics and strategies in terms of a realistic balancing of benefits against costs, including identification of system-level externalities and the potential for unintended consequences. A sound analytical foundation is a critical element in establishing plans, actions, and priorities that will achieve the wide acceptance necessary for successful implementation.

Given a solid understanding of the risks, the next stage is to develop and deploy systems and improved operational practices that will enhance timely detection of malicious individuals and their weapons and reduce the vulnerability of targets likely to be most attractive to attackers. Vulnerability mitigation or reduction can include preventing or controlling access to targets, "hardening" those targets so that an attack is entirely unsuccessful or causes only limited harm, and developing countermeasures that will disrupt or defeat attacks.

Passengers aboard a ferry leaving Manhattan on September 11, after the attacks on the World Trade Center. (Photo ©AP/Wide World Photos)

Effective application of sophisticated technologies is a key aspect of vulnerability reduction. In general, a multiplicity of subsystems is needed in order to create a layered defense in

Office of Homeland Security, July 2002.

which there are multiple ways that an attack can be prevented or minimized. Creative designs may enable separate system elements to complement and enhance the effectiveness of each, yielding more robust overall results. The complexity and criticality of major security systems imposes particularly high standards on their engineering and deployment.

The rapid rate of technological evolution is continually expanding the range of tools available to the defender, but also potentially enabling new or more dangerous attack strategies. Hence, it is critical that continuing efforts be devoted to development and evaluation of improved security technologies and new means to match emerging threats.

The functioning of transportation systems entails participation by many people, and requires a high degree of convenience and access for users. The reality is that some future attacks could be successful, in spite of the many countermeasures in place. In such an event, the direct harm caused by the attack may well be determined in large part by the knowledge, equipment, training, and advance planning that can be brought to bear by first responders and others. Assessment of the successes and failures of efforts in the aftermath of major natural, accidental, and malicious disruptive events can offer valuable guidance as the final stage in planning for the unknowable situations that might arise.

Reduction of longer-term consequences—post-attack cleanup and restoration of functions and services—can similarly be maximized by prior assessment of potential incident and recovery scenarios and strategies. Prior planning for operational alternatives and steps to facilitate implementation of those plans can make a dramatic difference in the total impact of an attack.

Transportation-Related Terrorist Incidents

1968 **Airplane Skyjackings.** Over the course of five months in 1968, five U.S. air carriers are skyjacked and diverted to Havana, Cuba. Skyjackings, particularly in Europe and the Middle East, are prevalent through the 1970s.

1983 **U.S. Embassy Bombing, Beirut.** A suicide truck bomb kills 63 and injures 120.

1983 **U.S. Marine Barracks Bombing, Beirut.** Simultaneous suicide truck bombs on American and French compounds kill 242 Americans and 58 French troops.

1985 **Achille Lauro Hijacking.** Terrorists seize an Italian cruise liner in the Mediterranean, taking more than 700 hostages. One U.S. passenger is killed.

1988 **Pan Am Flight 103 Bombing.** A Boeing 747 en route from London to New York is blown up over Lockerbie, Scotland by a bomb apparently placed in the cargo container. All 259 people on board are killed.

1993 **World Trade Center Bombing, New York.** A car bomb in an underground garage of the Trade Center kills six and injures 1,000.

1995 **Tokyo Subway Attack.** A sarin nerve gas attack on a Tokyo subway station kills 12 and injures 5,700. A similar attack occurs nearly simultaneously in the Yokohama subway.

1995 **Federal Building Bombing, Oklahoma City.** A massive truck bomb destroys the Murrah Federal Building, killing 166 and injuring hundreds more in what was up to then the largest terrorist attack on U.S. soil.

1996 **Paris Subway Bombing.** An explosion aboard a subway train entering a Paris station kills 4 and injures 86.

2000 **Attack on U.S.S. *Cole.*** A dinghy carrying explosives rams the U.S.S. *Cole* as it refuels in a Yemeni port, killing 17 sailors and injuring 39.

2001 **Attacks on U.S. Homeland.** On September 11, hijacked airliners crash into the twin towers of the World Trade Center, the Pentagon, and, in an apparent failed attempt at a high-profile Washington target, a field in southern Pennsylvania. More than 3,000 U.S. citizens and other nationals die as a result of these acts.