CHAPTER 22

Terrorism as Disaster

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According to the old common wisdom, terrorists want an audience, but not a large number of dead (see Waugh, 1990). The reasoning is that, while attacks can demonstrate the power and commitment of the terrorists, the vulnerabilities of their targets, and the ineffectiveness of government authorities, large numbers of deaths can alienate political support. Grisly pictures of car and suicide bombings cause television viewers to weigh the objectives of the organizations against those human lives. Now, the old common wisdom itself has been a casualty of evolving terrorist motivations and technologies of war. Since the 1980s, terrorists have shown increasing willingness to kill many people, often innocent bystanders, without regard for the impact on public opinion and potential political support. Bombings of aircraft, public markets, schools, and other gathering places have increased the casualty lists. The general populace, rather than representatives of the state or socioeconomic elitists, has become the target of choice. As a result, the new common wisdom since the 1990s is that terrorists may wish to kill hundreds or thousands or even millions of people and may well have the wherewithal to do it. The shift to mass casualty and mass destruction attacks by some terrorist organizations has increased the potential for disaster and fundamentally changed the nature of the hazard. Moreover, as the scale of the attacks has increased, the psychological and social impacts of terrorism have certainly changed. Individuals and communities often surprisingly adjusted to the relatively localized violence that characterized terrorism during the early decades after World War II. The potential lethality and destructiveness of terrorism today makes it a hazard that cannot be ignored.

There are a number of reasons why terrorists have been willing to kill and/or injure large numbers of people. First, they frequently have their own financial and material sources and are not as dependent on outside support. Financial support from so-called "rogue" states, criminal activities (e.g., robberies, kidnappings, extortion, and drug smuggling), and wealthy benefactors reduces the need for outside fund raising, and thus reduces the need to appeal for broad popular support. Second, groups motivated by religious or political extremism or very broad international goals are less likely to draw support domestically or internationally than those seeking autonomy from central authorities or colonial powers. Many groups have little expectation of or need for broad popular support. Third, access to military weapons from assault rifles to sophisticated explosives, as well as capabilities to build such low-tech weapons as homemade fertilizer and fuel oil bombs, have increased the potential lethality of such groups. Little sophistication is needed to improvise a large explosive device. As a

result, terrorists have created disasters on a scale that has required the same kinds of hazard management, disaster response, and long-term recovery that nations have had to provide for major earthquakes, typhoons, floods, industrial accidents, and other acts of nature and man.

The escalation of the potential lethality of terrorist attacks was evident in the first World Trade Center bombing in 1993 and the sarin gas attack in the Tokyo subway in 1994. In both cases, the scale of the disasters could have been much greater had the terrorists' devices functioned as intended. The attacks were relatively unsophisticated in terms of the technologies involved, but either could have caused hundreds or even thousands of casualties. The escalation of terrorist capabilities was clear in the bombings of the Khobar barracks in 1996, the U.S. embassies in Kenya and Tanzania in 1998, and the USS *Cole* in 2000. Those attacks were directed against targets that were assumed to be secure. Since then, the 9/11 attacks in New York and Arlington and bombings in Bali (Indonesia), Riyadh (Saudi Arabia), Istanbul (Turkey), Beslan (Russia), Madrid (Spain), Taba (Egypt), London, Netanya (Israel), and Sharm el Sheik (Egypt) have provided evidence that the risk of terrorist attack is increasing and from several quarters. While none of the attacks involved chemical, biological, or radiological devices or materials (so-called weapons of mass destruction [WMD]), they did involve large numbers of casualties and significant destruction. They also had and continue to have tremendous impact on the nations involved and have raised questions concerning the efficacy of government officials responsible for providing security. Perhaps more importantly, the increasing consequences and frequency of terrorist attacks, the two common measures of risk, have encouraged policymakers to respond. The potential costs of such attacks are so great that preventing them, rather than apprehending terrorists after their violence, has become the focus of government efforts (Heymann, 1998). No leader wants to have a major attack on his or her "watch" because public safety and security is a fundamental responsibility of government. The political costs of failure can be very high. Unfortunately, too little attention has been paid to the need to mitigate the effects of potential attacks, to lessen their physical, economic, and psychological impacts.

For the United States, the deaths of almost 3000 people in the airliners, collapsing towers, and damaged Pentagon on September 11, 2001, have had a profound effect on the nation's sense of security. The attacks led to the largest reorganization in the U.S. federal government since the creation of the Department of Defense in 1946 when the Department of Homeland Security was created in 2003. Massive investments in security programs have also meant major shifts in federal spending away from social and economic programs. Similarly, the attacks in Madrid in 2004 and London in 2005 have shaken public confidence in their governments' capacities to protect residents and visitors and encouraged increased investments in security technologies and programs. The political costs of failure were evident in the aftermath of the rail station bombings in Spain. Spanish officials responded poorly to the bombing, blaming a domestic group, and were voted out of office as a result. Around the world, terrorist violence has precipitated increased security measures to monitor public gathering places, to control national borders, and to protect sensitive facilities (such as airports, ports, and rail stations). The economic and sociopolitical costs of security are growing exponentially with little evident reduction in the risk of attack, although some potential targets are much better protected.

DISASTER AND TERRORISM

The association of disaster with terrorism is not new and the scale of recent attacks and the potential for future attacks have certainly focused official and public attention on the

consequences of worst-case scenarios. In some measure, the historical association of disaster with war (Gilbert, 1998, pp. 12–13) may be how officials view the association between disaster and terrorism. Their major concern seems to be how people will react to external threats, rather than how people and communities might deal with such threats. Indeed, the disaster research community and many professional emergency managers tend to focus less on the specific nature of "weapons of mass destruction" than on developing capabilities to deal with those and similar hazards and the resilience to adapt and recover quickly. The shifting official focus from NBC (nuclear, biological, and chemical) weapons and materials to the current CBRNE (chemical, biological, radiological, nuclear, and explosive) weapons and materials has been seen as something of a policy "shell game" and the limited attention given to community preparedness and resilience has been a source of great frustration. It is encouraging, however, that the U.S. military is now interested in the importance of "civil security," the role of individuals and communities in reducing vulnerabilities to attack and developing measures to reduce their impact (Dory, 2003). Dealing with the disasters that might result from terrorist attacks is an increasing concern, but the focus of Department of Homeland Security policies and programs is still overwhelmingly on preventing such attacks. That same pattern appears common among other nations dealing with the threat of terrorism. Facilities and officials with high "target value" are secured and military and law enforcement authorities focus on apprehending terrorists before they act (see Alexander, Y. 2002).

The potential for terrorist-caused disasters is clear in Homeland Security planning. In 2004, the Homeland Security Council created 15 planning scenarios to aid in the development of preparedness programs (see Table 22.1). Twelve of the scenarios involve terrorist attacks and the dimensions of the disasters that are identified as important are the expected casualties (killed, injured, and hospitalized), damage to infrastructure (broadly defined), economic impact, and recovery time. The detonation of a nuclear device that might result in an extremely high casualty rate and total destruction of infrastructure within a half to a full mile radius is the worst case in the listing in terms of casualties and damage in the immediate area, economic costs, and recovery time. The projected casualties from the biological and chemical attack scenarios range from a few hundred to thousands with recovery in weeks to months. Interestingly, the casualty estimates from a pandemic influenza outbreak are 87,000 fatalities and 300,000 hospitalizations. Current estimations from the Centers for Disease Control and Prevention of fatalities from an influenza outbreak such as the catastrophic 1918 outbreak are from 2 million to 150 million, with 7.4 million being a "reasonable estimate" (McKenna, 2005). The potential for millions of deaths is one of the reasons why public health officials have argued that influenza is a much bigger threat than bioterrorism and, consequently, much more funding should be provided for programs to identify and respond to influenza outbreaks early. After Hurricane Katrina, it would also appear that estimations of casualties and costs for natural disasters should also be reassessed. The damage, economic costs and recovery time for the Hurricane Katrina disaster far exceeds the Homeland Security Council's hurricane scenario estimates.

Homeland Security policies have been designed and adopted and programs have largely been implemented with little assessment of risk (Reese, 2005). Plans are being made to deal with worst-case scenarios, rather than the most likely scenarios. While recent attacks have demonstrated that terrorists can cause mass casualties and mass destruction, tax response capabilities, and require long-term investments in recovery, not all are at equal risk of attack and, in fact, many are at very little risk. Not all potential targets are of sufficient symbolic value to attract terrorists. More importantly, not all terrorists have the wherewithal or even the desire to kill many or cause catastrophic destruction. A reasoned assessment

Table 22.1. Homeland Security Council's Fifteen Planning Scenarios

Scenario	Casualties	Infrastructure Damage	Economic Impact	Recovery Timeline
Nuclear detonation 10-kiloton improvised nuclear device	Can vary widely	Total within radius of 0.5 to 1.0 mile	Hundreds of billions of dollars	Years
Biological attack aerosol anthrax	13,000 fatalities and injuries	Minimal	Billions of dollars	Months
Biological disease outbreak pandemic influenza	87,000 fatalities, 300,000 hospitalized	None	$70 to $160 billion	Several months
Biological attack plague	2500 fatalities, 7000 injuries	None	Millions of dollars	Weeks
Chemical attack blistering agent effects	150 fatalities, 70,000 hospitalized	Minimal	$500 million	Weeks, but long-term
Chemical attack Toxic industrial chemicals	350 fatalities, 1,000 hospitalized	50% of structures in area	Billions of dollars	Months
Chemical attack nerve agent (in a building)	6,000 fatalities, 350 injuries	Minimal, but contamination	$300 million	3–4 months
Chemical attack chlorine tank explosion	17,500 fatalities, 10,000 severe injuries, 100,000 Hospitalized	In immediate area and metal corrosion	Millions of dollars	Weeks
Natural disaster major earthquake	1400 fatalities, 100,000 hospitalized	150,000 buildings destroyed, 1 million damaged	Hundreds of billions of dollars	Months to years
Natural disaster major hurricane	1000 fatalities, 5000 hospitalized	Buildings destroyed 100,000 buildings seriously damaged	Millions of dollars	Months
Radiological attack radiological dispersal devices	180 fatalities, 270 injuries, 20,000 detectable contaminations	Near explosion	Up to billions of dollars	Months to years
Explosives attack improvised Explosive device	100 fatalities, 450 hospitalizations	Near explosion	Local	Weeks to months
Biological attack food contamination	300 fatalities, 400 hospitalizations	None	Millions of dollars	Weeks
Biological attack foreign animal disease (foot and mouth disease)	None	None	Hundreds of millions of dollars	Months
Cyber attack	None directly	None	Millions of dollars	Weeks

Source: Homeland Security Council, Planning Scenarios: Executive Summaries, July 2004.

of risk might better identify potential targets, better prepare law enforcement and security officials and emergency responders, and help better target resources for the attacks that may come.

Terrorist acts do pose some unique problems for those targeted and those responsible for dealing with attacks and threatened attacks. Fortunately, the unnatural disasters resulting from terrorism are very similar to those resulting from natural phenomena, as well as human accidents and technological failures. In many respects, recent terrorist-sponsored disasters have been very similar to natural and other man-made catastrophes. The same first responders have to deal with the consequences of terrorist acts that have had to deal with structural collapses, fires, train wrecks, vehicle crashes, pandemics, and other large-scale disasters. The same second responders have to deal with the physical and psychological trauma, restoration of lifelines, and other activities to get individuals and communities functioning again. The same support agencies need to assist with short- and long-term recovery.

However, terrorist-sponsored disasters are different from other kinds of disaster in several ways. First, disasters caused by terrorists are not accidents or "acts of God." They are caused by people and they are caused on purpose. The images of dead and injured children recovered from the daycare center in the collapsed Murrah Federal Building in Oklahoma City in 1995 were all the more disturbing because the act that brought down the building was intentional and was committed by other Americans. Similarly, the fact that British citizens were involved in the July 2005 London subway bombings was met with disbelief by many Britons and has led to a reassessment of the terrorism threat in the United Kingdom

Second, disasters caused by terrorists are crime scenes. Consequently, responders to terrorist disasters should avoid, as much as possible, disturbing the crime scene in order to preserve evidence that may help law enforcement officers apprehend the terrorists. Protocols have been developed in the United States since the Oklahoma City bombing to minimize contamination of crime scenes by rescue workers and to lessen the likelihood that law enforcement officers will interfere with lifesaving action when they are securing the sites and preserving evidence. Third, disasters caused by terrorists normally involve a mix of responders very similar to that for a natural disaster, but generally involve law enforcement and military personnel in lead, rather than support, roles. Large-scale disaster responses frequently involve large numbers of governmental and nongovernmental agencies, as well as organized and spontaneous volunteers. In that regard, responding to natural disasters and terrorist disasters are very similar in that the resources of broad networks of public, nonprofit, and private organizations and individuals may be needed (Waugh, 2003b; Waugh & Sylves, 2002). While authorities dealing with terrorist incidences may be reluctant to use nongovernmental resources, particularly volunteers, they may be essential in very large events. The response to the Oklahoma City bombing involved dozens of organizations, from the American Red Cross to the Oklahoma Restaurant Association, and hundreds of individual volunteers (City of Oklahoma City, 1996). The response to the World Trade Center attack drew hundreds of organizations and many thousands of volunteers (see, e.g., Lowe & Fothergill, 2003; McEntire, Robinson, & Weber, 2003; Sutton, 2003). Similar intergovernmental, multiorganizational responses occur in other nations. For example, the responses to bombings in Istanbul in November 2003 were very similar to the response in Oklahoma City (Ural, 2005) as nongovernmental organizations (NGOs) assisted with the response and recovery efforts. Designing an effective response to terrorist disasters, in fact, is complicated by the lead roles of agencies unfamiliar with the networks that respond to large natural disasters and unused to communicating and collaborating closely with nongovernmental actors (Waugh, 2004a). The largest difference between the responses to terrorism-related disasters and other kinds of disasters is just that—the lead roles of agencies and officials

responsible for capturing or killing the perpetrators rather than performing lifesaving roles and helping reduce the impact of the disaster on people and property.

Contamination, surge capacity to deal with mass casualties, need for close cooperation among agencies at all levels and among all agencies involved in the response, legal measures before the event to facilitate prevention and apprehension of terrorists, and heightened risk of panic and posttraumatic stress disorder (PTSD). The dependence upon local responders is a key element in the response (Pangi, 2003b) as it is during a mass casualty natural disaster. There is still some uncertainty concerning how the public will react to large scale terrorist attacks even after the 9/11 attack (Winslow, 1999), but better public education can reduce the impact of the violence (Pangi, 2003a) and facilitate recovery.

THE NATURE AND PURPOSE OF TERRORISM

Terrorism is difficult to discuss without some attention to its nature and forms. The threat of catastrophic terrorism was not new in 1993 when the World Trade Center (WTC) was bombed and certainly was not new in 2001 when hijacked aircraft hit the WTC towers. Hundreds of terrorist attacks occur every year (Waugh, 2003a) and terrorist violence has caused millions of deaths and countless physical and psychological injuries for millennia. Ancient armies massacred civilian populations to frighten and demoralize opposing armies. Medieval armies flung plague-ridden bodies over city walls and dropped animal carcasses into water supplies to frighten and sicken residents. Villagers were slaughtered and crops burned to discourage resistance to foreign and indigenous rulers. In short, terrorism is an ancient tactic of warfare and political conflict and it has remained a weapon in modern warfare and the politics. Terrorist violence has commonly been used by combatants on all sides in ancient and modern conflicts. The bombings of London, Dresden, Hiroshima, and Nagasaki during World War II were designed to demoralize enemy populations, officials, and armies. Since World War II, threats of violence have chased—indeed, continue to chase—civilian populations from their homes and put them at risk of attack, as well as at risk of famine, disease, and other threats to life. Such is the case in Darfur in the Sudan. Terrorism was used by Serbian forces in Bosnia-Herzegovina, by Saddam Hussein's forces against Kurds and dissident Iraqis, by Taliban and al-Qaeda forces against officials in the new Afghan regime, and by indigenous insurgents and their foreign supporters and by terrorist groups against officials in the new Iraqi regime. Clearly, terrorism is neither a new nor an uncommon tactic in war and lesser political conflicts. Nor are catastrophic acts of terrorism new.

Some distinctions do need to be made between terrorism, terrorist violence, and other forms of political violence. The cliché that "one man's terrorist is another man's freedom fighter" is important to remember. The term "terrorism" has tremendous political baggage and generally is applied only to one's enemies, but the use of terrorist violence is more widespread than that would suggest. Violent acts to induce terror have been used for thousands of years as a part of psychological warfare. Terrorist violence has also been used for criminal and other nonpolitical purposes. There are common elements in most definitions of terrorism:

1. The use or credible threat of extraordinary violence;
2. The presence of a purpose or goal;
3. The choice of targets for their symbolic value; and
4. The intent to influence a broader audience than the immediate victims (Waugh, 1982, 1990).

If violence has been used in the past, the terrorists may only have to threaten further violence in order to cause fear or terror. Terrorists may have political, economic, social, or cultural, for example, religious, goals. The focus here is on terrorism with political purposes, but economic, religious, and other purposes may also be present. Because terrorist groups are usually small, from a very few to a few thousand, they tend to focus their attacks on people, facilities, and other targets that will maximize their impact and minimize their losses. Attacks on judicial officials, elected leaders, business persons, and other high-profile individuals, including foreign tourists, can get the public's attention. Direct attacks on military and law enforcement personnel, for example, usually are too risky for groups with limited human and material resources. Nonetheless, terrorists may have the wherewithal to engage military and police forces when they have a large enough base of support. In military terms, the violence can escalate into guerrilla warfare or insurgency and even into civil war. U.S. military spokesmen, for example, distinguished early in the Iraq War between Iraqi insurgents and foreign terrorists although the distinction became somewhat blurred for officials and the media alike as the violence escalated. Defining the conflict as a civil war would acknowledge that the insurgents have sufficient popular support or at least acquiescence to wage war on the new Iraqi regime. In reality, the new regime and its supporters are fighting with remnants of the old regime (i.e., Baathists and other insurgents), foreign groups (at least one associated with al-Qaeda), and indigenous criminal groups. Terrorist tactics appear to be common among all the groups, including those using kidnappings for financial gain.

Second, terrorism can be used by governments as well as nongovernmental groups. State terrorism is common. Governments may use violence and/or the threat of violence to silence political dissent, remove opposition, and/or enforce policies. Violence may be used or threatened to intimidate racial and ethnic and religious groups. Vigilante terrorist groups may emerge to help officials enforce laws and to punish dissenters. Terrorist organizations may be independent of government influence, loosely connected to government officials, or even directly connected to government authorities and acting as their agents. Terrorist goals may be revolutionary in terms of seeking to overthrow a government or social system or subrevolutionary in terms, for example, of seeking change in a particular law or removal of a particular official. Terrorist organizations may have broad or limited goals, they may or may not attack human targets, and they may or may not have links to states or officials. The question is whether they intend and have the capabilities of causing mass destruction and/or mass casualties—that is, causing catastrophic effects (see, e.g., Waugh, 1982, 1990).

Third, terrorist intent is critical. In the 1940s and 1950s, the most common motivations were independence from colonial influence or separation of ethnic groups from established nations. Popular support, including international support, was a goal. During the 1960s and 1970s, the motivations often were connected to the Cold War with the groups acting as agents of or surrogates for the United States and its allies and the Soviet Union and its allies. During the 1980s and 1990s and into the 21st century, transnational groups and the motivations often were mixtures of political and religious goals. The so-called "new terrorists" are difficult to locate and apprehend because they have relatively small units acting with minimal or perhaps no central control. Terrorists with religious motivation do tend to be more willing to kill large numbers of people than secular terrorists (Hoffman, 1999, p. 21).

Fourth, some terrorist organizations have demonstrated their willingness to cause mass casualties and the available weaponry has become ever more lethal. Current focus on the threat of so-called WMD is somewhat misleading when military-style automatic weapons and explosives are readily available in many parts of the world, including the United States Hazardous chemical, biological, and radiological materials are available and some groups

have the capabilities of building weapons with such materials. And, there is a risk that terrorist organizations or states will buy, steal, or replicate a biological or nuclear weapon developed during the Cold War. Nuclear proliferation and the security of nuclear weapons left over from the Cold War are also concerns. There are hundreds of international terrorist attacks every year and the most common weapons are explosive devices, often homemade (U.S. State Department, 2004, 2005). The potential for terrorists to get weapons capable of killing thousands or even millions exists, but there is much greater likelihood that they will use homemade bombs or purchased or stolen conventional explosives (Smithson & Levy, 2000). Following the 2001 attacks by international terrorists, there was a series of attacks involving anthrax, a biological agent, which are assumed to have been committed by a domestic terrorist or terrorists. But, the scale of the attacks was relatively small. Having the capability of creating biological weapons does not necessarily mean having the capability of delivering such weapons.

All of this is to say that terrorists may be states or small organizations or even individuals and their goals may be limited or very broad. They may avoid killing or injuring human beings or they may be willing to cause mass casualties and mass destruction. Clearly, some wish to cause catastrophic disasters and have the capabilities to carry out those intentions. The U.S. experience with the World Trade Center attacks in 1993 and 2001 and the Oklahoma City federal building bombing in 1995, the Japanese experience with the sarin attack in 1995, the Indonesian experience with the Bali bombing in 2002, the Russian experience with the hostage taking in the Moscow theater in 2002 and the Beslan school in 2004, the Spanish experience with the train station bombing in Madrid in 2004, and the British experience with the subway attacks in 2005 are testaments to the disastrous consequences of terrorist acts. Airliners full of passengers, hotels full of guests and staff, schools full of children and teachers, corporate facilities full of workers and customers, and marketplaces full of shoppers have often been targets of terrorists. The resultant disasters have required quick action by emergency responders, coordination of efforts by emergency managers, and long periods of recovery, not to mention recovery from the physical and psychological damage suffered by their victims. The potential that chemical plants might be bombed, dams or bridges might be bombed, water supplies might be poisoned, critical computer infrastructure might be disabled, virulent diseases might be spread among human or animal populations, or any number of other catastrophes might be perpetrated by terrorists gives impetus to efforts to prevent, mitigate the effects of, and prepare for such events. Thus far, terrorist disasters have been handled reasonably well with the resources at hand.

TERRORISM DISASTER RESPONSES

Aircraft bombings have killed hundreds at a time, often with no survivors. For Americans, there were major terrorist attacks before the bombing of the World Trade Center in 1993 and the Murrah Federal Building in Oklahoma City in 1995 that required substantial emergency responses, but those experiences were often used as the baselines for dealing with terrorist events until the 9/11 attacks.

The Oklahoma City Bombing.

When a 4,800 pound homemade bomb exploded at 9:02 A.M. on April 19, 1995, in a truck next to the Murrah Federal Building, the front of the structure collapsed and buildings in a

10-block radius were also damaged. The police, fire, and emergency medical response was quick and the Oklahoma City Fire Department became the lead for the disaster response. Later, law enforcement agencies set up their own perimeters to secure the site and to collect evidence. The bombing of the federal building caused a disaster that elicited a national response and federal, state, and local responders converged to rescue victims and search the collapsed facility. Emergency responders from surrounding states were drawn into the effort as the days progressed. Via the media, the nation lived through the bombing and its aftermath.

Because the event involved a federal crime (terrorism), a federal facility, and the deaths of federal officers, the FBI and other federal agencies had clear jurisdiction. Nonetheless, the search and rescue operation was managed by Oklahoma City fire personnel. Federal resources, including "federalized" Urban Search and Rescue Teams and a Disaster Mortuary Team, were brought in by the Federal Emergency Management Agency (FEMA). The response and recovery operations lasted 16 days. One hundred and sixty-eight people were killed, some in surrounding buildings or on the street. Firefighters from more than 75 Oklahoma municipalities and more than 35 departments from Texas, Kansas, Arkansas, and other states were involved. More than 1000 FEMA personnel and hundreds of personnel from other federal agencies were involved. The American Red Cross and numerous other nonprofit organizations, as well as private sector organizations, were involved (Oklahoma City, 1996; Waugh, 2000b). The scale of the disaster required considerable resources from all levels of government and from NGOs. But, the Oklahoma disaster was very small in comparison to the disaster caused by terrorists on 9/11.

The 9/11 Attacks

The collapse of the World Trade Center towers was one of the largest terrorist caused disasters in modern history. While the number of deaths and injuries were remarkably small given the numbers of people in the towers, the surrounding streets, and the subway system below the towers that morning, the psychological impact of the disaster was tremendous. The physical and economic impacts upon the city and the surrounding metropolitan area were catastrophic. This was the most costly disaster for FEMA, the U.S. Department of Housing and Urban Development, and the U.S. Department of Transportation (U.S. GAO, 2003, p. 19). While statistics cannot adequately capture the scale of the disaster, Tables 22.2 to 22.5 do document the economic impact of the disaster response. Table 22.2 indicates the funds authorized and

Table 22.2. The 9/11 Disaster: Initial Response Assistance (as of June 30, 2003)

	Total Committed	Total Disbursed
Search and rescue operations	$22,000,000	$22,000,000
Debris removal	1,689,000,000	695,000,000
Emergency transportation	299,000,000	298,000,000
Temporary utility repairs	250,000,000	0
Testing and cleaning	53,000,000	42,000,000
Other response services	232,000,000	114,000,000
Total	$2,554,000,000	$1,170,000,000

Source: USGAO, Federal Disaster Assistance, October 2003.

Table 22.3. Compensation for Disaster-Related Costs and Losses (as of June 30, 2003)

	Total Committed	Total Disbursed
Assistance for state, city, and other organizations	$3,319,000,000	$1,593,000,000
Assistance to individuals and families	807,000,000	546,000,000
Assistance for businesses	683,000,000	510,000,000
Total	$4,809,000,000	$2.649,000,000

Source: USGAO, Federal Disaster Assistance, October 2003.

disbursed for the initial disaster response in New York City and the surrounding area. The search and rescue operations cost $22 million and debris removal cost $695 million. Almost 2 years after the collapse of the World Trade Center towers, the total federal expenditures for response totaled $1.17 billion. As Table 22.3 shows, $2.649 billion was provided as assistance to state, city, and other organizations, to individuals and families, and to businesses.

As Table 22.4 shows, more than $5.5 billion was committed to rebuild the transportation system in lower Manhattan, repair utilities, and support short-term capital projects. The rebuilding of the transit system has been slow and only $54 million of the committed $5 billion were disbursed as of June 2003. Reconstruction continues in and around the old World Trade Center site. Lastly, Table 22.5 shows the commitment of $5.5 billion in funds and tax benefits for economic revitalization. By June 2003, $173 million in funds had been disbursed, and presumably the tax benefits had had some impact. Two items to note are the differences in funds committed and funds spent and the provision of tax benefits. Expenditures can stretch out for years as recovery projects are implemented. In addition to the losses covered by federal programs, the uninsured and insured losses were in the billions of dollars. It took 9 months to clear the debris and approximately 18,000 businesses were affected. Many businesses in lower Manhattan failed. It was a catastrophic disaster by any measure. The total amount of money committed to the New York City recovery through FEMA, the U.S. Department of Housing and Urban Development, and the U.S. Department of Transportation was in excess of $18 billion. The amount does not include Small Business Administration and other disaster assistance grants. FEMA activated 20 of its 28 Urban Search and Rescue Task Forces—almost 1300 members and 80 dogs (U.S. GAO, 2003, p. 24). Thousands of volunteers were used for search and rescue, support for emergency responders, and other critical tasks.

Table 22.4. Infrastructure Restoration and Improvement (as of June 30, 2003)

	Total Committed	Total Disbursed
Rebuilding and improving lower Manhattan transportation system	$5,006,000,000	$54,000,000
Permanent utility infrastructure repairs	500,000,000	0
Short-term capital projects	68,000,000	0
Total	$5,574,000,000	$54,000,000

Source: USGAO, Federal Disaster Assistance, October 2003.

Table 22.5. Economic Revitalization Efforts (as of June 30, 2003)

	Total Committed	Total Disbursed
Tax benefits—Liberty Zone	$5,029,000,000	—[a]
Job creation and retention grants	320,000,000	130,000,000
Small firm attraction and Retention grants	155,000,000	31,000,000
Other planning efforts	40,000,000	12,000,000
Total	$5,544,000,000	$173,000,000

Source: USGAO, Federal Disaster Assistance, October 2003.
[a] Tax benefits not disbursed as grants.

It should also be noted that the crash of TWA Flight 800 off Long Island in 1996 lead to the passage of the Aviation Disaster Family Assistance Act of 1996. Because the crash was initially presumed to be the result of a terrorist bomb, the lead agency was the F.B.I. rather than the National Transportation Safety Board (NTSB). Normally the NTSB would have investigated the crash and local authorities would have dealt with the victims and their families. The crash was deemed a crime scene and the F.B.I. acted to preserve evidence, including evidence associated with the victims' remains. There was little sensitivity to grieving families; a very slow process of identifying and releasing remains; and poor communication with families, airline officials, and local public officials. As a result of the public outcry, the Family Assistance Act was passed to ensure that the needs of victims and their families were met in aviation disasters. The Act specifies roles for the airlines, the American Red Cross, and other agencies and the airline industry has developed procedures to deal with such disasters.

HOMELAND SECURITY AND WEAPONS OF MASS DESTRUCTION

Since the 9/11 attacks, the U.S. government has focused its efforts on preventing further terrorist attacks and, to a lesser extent, on preparing for large-scale, mass casualty disasters. Homeland Security Presidential Directive 8 (HSPD-8) outlines the need for a "national preparedness goal" and a coordinated set of programs to encourage preparedness. Central to that effort have been the adoption of the National Response Plan, replacing the Federal Response Plan that guided the 9/11 response and previous natural disaster responses. Federal, state, and local agencies are being required to adopt a standardized structure, the National Incident Management System, to facilitate coordination during emergencies. The Department of Homeland Security provided guidance for the development of capabilities to deal with a range of national emergencies (U.S. Department of Homeland Security, 2005) and the Homeland Security Council in the White House developed a series of disaster scenarios to illustrate the range of threats that need to be address. There are four chemical scenarios, four biological scenarios (including one involving the plague), one disease scenario involving an influenza pandemic, one hurricane scenario, one earthquake scenario, one radiological scenario involving a "dirty bomb," one improvised explosive device scenario, one improvised nuclear device scenario, and one cyberterrorism scenario. The primary attention is given to large-scale chemical, biological, radiological, nuclear, and explosive (CBRNE) events. The scenarios have been criticized for

focusing on worst-case scenarios, rather than the most likely kinds of events, and focusing too little on natural disasters. That problem is manifest in the planning scenarios the Homeland Security Council developed for preparedness activities (see Table 22.1).

Problems with the responses to the four Florida hurricanes in 2004 have raised questions about the capabilities of DHS to deal effectively with non-terrorism-related disasters in which federal authorities are not in charge, but expected to communicate openly with the public, NGOs, and their state and local counterparts. That may be part of the reason why FEMA's responsibilities were refocused on disaster response during the DHS reorganization in the summer of 2005. A Congressional Budget Office report (CBO, 2005) on fiscal year 2005 and proposed fiscal year 2006 funding describes disaster relief as a "non-Homeland Security" function. What the reorganization will mean for the increasing number of state and local agencies with combined Homeland Security and emergency management responsibilities is uncertain. The report also indicates that DHS funding only accounts for $27.6 billion of the $49.1 billion that U.S. federal agencies will spend on homeland security in fiscal year 2005. The Department of Defense (DOD) will spend $8.6 billion in fiscal year 2005 and the president has asked for $9.6 billion for DOD in 2006. The additional funding likely reflects the expectation of an expanded role, even a lead role, for DOD in large-scale terrorist attacks within U.S. borders and that raises questions concerning legal restrictions on military support for civilian officials (Graham, 2005).

Few terrorist organizations have the capabilities necessary to create large nuclear or biological weapons, but more may be able to buy or steal what they cannot make themselves. If such weapons are acquired by groups willing to use them, the potential for catastrophic disaster would be vastly increased. Still, there is a greater likelihood of attacks involving much less sophisticated weaponry, such as the bombs used in the Oklahoma City and first World Trade Center bombings or vehicles carrying hazardous materials like liquefied natural gas or conventional "dirty bombs" designed to spread radiological or chemical material. The amount of military weaponry that might be available to domestic and international terrorists in the United States is also a serious problem. Tons of military-grade explosives, hundreds of assault rifles, and countless other munitions are missing from police and military facilities in the United States

Fortunately, capabilities developing to deal with pandemics may be used to deal with bioterrorist attacks, capabilities developed to deal with large-scale hazardous materials spills and accidents can be used to deal with chemical and nuclear terrorist attacks, and capabilities developed to deal with nuclear accidents can be use to deal with attacks involving nuclear materials. Preparedness, response, and recovery programs developed for natural and technological disasters can be adapted to deal with terrorist disasters (Waugh, 1990, 2001). The "all-hazards" approach that has been used in emergency management for the past two decades is predicated on the development of such adaptable capabilities (Waugh, 2005) and the "dual use" concept promoted by state and local emergency managers as Homeland Security programs were developed is based upon the necessity of adaptable programs.

While the focus of Homeland Security efforts has been on the prevention of terrorist attacks, there are also opportunities to mitigate the effects of attacks that cannot be prevented. Mitigation programs are currently underway to strengthen buildings so that they can absorb bomb blasts without collapsing, designing and redesigning buildings so that terrorists will have less opportunity to gain access, reprogramming activities to reduce access to sensitive areas of facilities, and so on (see, e.g., Waugh, 2001). Linking prevention activities to emergency response activities is also suggested in areas such as mass transit where systems may be vulnerable to attack (Waugh, 2004b).

THE CHALLENGES OF TERRORIST DISASTERS

Many questions remain concerning how to deal effectively with natural and technological disasters. How to provide effective alerts and warnings, how to educate the public about hazards and appropriate protective actions, how to encourage adequate emergency preparedness at the individual and community levels, and how to design and manage effective evacuation programs are a few of the many questions that have not been completely answered. Many questions have been answered, such as why people may not choose to evacuate when authorities ask them to do so. The question that arose in the months after the 9/11 attacks and as the nation's Homeland Security programs were being put into place was how much knowledge gained over a half century of dealing with natural and technological disasters is transferable to terrorist disasters. The emergency management professional community and the disaster research community have generally argued that much of what we know about dealing with natural and technological hazards and disasters is applicable to Homeland Security. Nonetheless, relatively little has been transferred. For example, the weight of social science research supports the conclusion that panic is rare in disasters, particularly when people are given sufficient information to determine what they should do. That is also true in disasters involving nuclear and biological material, in chemical accidents and spills, and in pandemics. There was no panic at Chernobyl in 1986 during the world's worst nuclear accident (see, e.g., Medvedev, 1990). There was no panic in the Tokyo subway in 1995 during the Aum Shinrikyo sarin attack (see, e.g., Murakami, 2000). There are also remarkable stories of heroism and calm from the World Trade Center collapses. Panic appears to be far more common in circumstances where information concerning appropriate protective action is poor or nonexistent or people are literally trapped in buildings or ships or other structures. Experience and research strongly support the need to provide as much information as possible during emergencies, rather than withhold information for fear of causing panic. Unfortunately, Homeland Security and law enforcement decision makers appear disinclined to provide information when it is needed in an emergency.

The coordination of federal, state, and local Homeland Security programs has also been problematic as three TOPOFF (Top Official) exercises have demonstrated. While there are still coordination problems when federal, state, and local emergency management agencies work together, some of the cultural and organizational differences have been worked out over the years. The frequency of natural and technological disasters does provide plenty of opportunity to test and correct systems and to become familiar with the capabilities and priorities of other agencies. The infrequency of terrorist incidences limits opportunities to learn how to improve capabilities, although greater funding of Homeland Security programs may encourage more training and exercising. In fact, funding shifts may well mean a loss of federal, state, and local capabilities to deal with more common natural and technological hazards and disasters.

CONCLUSIONS: TERRORISTS AND DISASTER

Terrorist disasters can closely resemble natural and other man-made disasters. The 9/11 World Trade Center disaster involved airliner crashes, high-rise fires, structural collapses, hazardous materials events, as well as numerous lesser emergencies. The scale certainly was greater than for other terrorist events, but less than that of the 1906 San Francisco earthquake or the next great "urban" quake in California. The organizational effort following the World Trade

Center attacks required extraordinary coordination and communication (much of which was ineffective), but, in many respects, the disaster itself created familiar imperatives.

There are differences between terrorist disasters and other kinds of disasters. However, the range of possibilities makes it extremely difficult to identify potential targets, let alone protect them. The next terrorist disaster could take many forms—from a dam collapse to a biological attack to a nuclear blast. The attackers may be al-Qaeda operatives or American militia members or they may be from any number of other international or domestic extremist groups. The attacker may be another lone bomber or a lone biochemist with anthrax or ricin or hoof and mouth virus. The point is simply that the range of possibilities is so great that a broad approach is necessary to ensure that law enforcement, military, and emergency response personnel have a range of capabilities, therefore a more generic "all-hazards" program would be more adaptable to circumstances than a terrorism-focused program (Waugh, 1984, 2005).

FUTURE RESEARCH AGENDA

The literature on terrorism, terrorists, terrorist weapons, antiterrorism measures, and counterterrorism policies and programs is large and growing. Much is known about terrorist motivations, organizations, weaponry, and tactics and much is known about anti- and counterterrorism measures. The persistent issues have been related to the relationship between terrorists' political objectives and their choice of targets and to the effectiveness of anti- and counterterrorism policies and programs. It has also been common to focus on the instruments of terrorist violence, rather than on the human targets. Military studies have tended to focus on the lethality of weapons and measures to preempt or prevent attacks through improved intelligence gathering. Nuclear proliferation and the potential for chemical and biological agents to be lost, stolen, or sold to terrorists are the major concerns. Security studies typically focus on risk and vulnerability assessments and the "hardening" of facilities, including security "layering." Law enforcement studies tend to focus on prevention and the apprehension of the terrorists. The problem of terrorism is, in fact, many problems, but there is a need to find a broader perspective that will facilitate the development of a comprehensive strategy to deal with the hazard of terrorism. The "all-hazards" model is a logical vehicle for doing so.

The study of anti- and counterterrorism policies and programs in the United States has been seriously hampered by the secretiveness of the Department of Homeland Security. Access to officials and offices has been severely limited. Even analysts from the Government Accountability Office and Congressional Research Service, the agencies that provide information to members of Congress and other policymakers, complain that Homeland Security officials do not respond to their inquiries and do not provide requested information. Academic researchers generally are even less successful in gaining access to people or data within the Department. The lack of transparency in decision making and lack of openness in dealing with the public and its representatives may protect the Department from critics, but it also reduces trust in Homeland Security leaders and programs and denies the Department the benefits of outside review. The creation of the Department of Homeland Security was the largest federal reorganization in almost 60 years and academic researchers are anxious to see how the constituent programs and personnel are being integrated. The creation of the Department also consolidated many, but not all, of the federal programs that deal with the internal and external threats from terrorism. The operation of the new department needs careful analysis and access by academic and government analysts would provide useful information to Homeland Security decision makers, as well as to researchers, policymakers outside the department, and the public.

Future research efforts should focus on at least the following general topics:

1. A better understanding of terrorism and why individuals and groups choose to use violence to achieve political ends is critical, if the risks of violence are to be addressed in the long term. To counter the choice to use violence authorities need to address the precipitants of terrorism, including poverty and religious intolerance, and to provide alternatives.
2. More effective organization of anti- and counterterrorism programs is a fundamental need. Intergovernmental coordination to deal with terrorism and other potential disasters has been problematic. Coordination is awkward in a federal system like the United States because of the division of powers. National authorities generally have greater resources, but cannot always bring them to bear during terrorist incidences. Local authorities may well have more experience dealing with bombings, hostage cases, and other terrorist-type events than their federal counterparts, but too often lack sufficient resources to deal with threats and attacks. Local authorities typically have much more experience dealing with disasters and can bring essential skills in hazard mitigation, preparedness, response, and recovery to counterterrorism programs.
3. Better coordination of multiorganizational operations is a critical need. Incident command systems (ICS) were developed to coordinate large fire responses. That type of hierarchical command structure seems to work in those kinds of environments, but have serious limitations in other kinds of disasters and with other kinds of organizations. Unity of command may not be practicable in many complex emergencies, such as pandemics or even large-scale terrorist incidences. Unified command with a more consensus-based decision process may be much more effective. Similarly, the National Incident Management System (NIMS) which is supposed to use ICS principles to structure a national response to large-scale disasters and terrorist incidences may be seriously flawed because it may run counter to the system of shared governance in the United States and may interfere with local first response. Certainly newly centralized decision processes delayed deployment of National Guard troops and first responder volunteers during the Hurricane Katrina disaster. Reliance on officials in Washington to make critical decisions that could have been made at the local or state level is a serious flaw in the system. The disconnection between local needs and the national response is a reflection of the centralization problem, as well.
4. The integration of law enforcement and military personnel into disaster response is problematic. Law enforcement officers have interfered with lifesaving activities in major disasters, including terrorism-related disasters, in the past because of their priority of preserving evidence. The Katrina experience demonstrated the value of military participation in catastrophic disaster responses, particularly in security and in search and rescue operations, but military personnel are not trained to deal with victims more broadly. Research is needed on how to prepare law enforcement and military personnel better for disaster relief operations and how to prepare local officials to interact effectively with those personnel. A starting place might be a better understanding of legal, political, and social roles.
5. The development of intersector collaboration has been very slow. Most of the nation's infrastructure is in the private sector and there has been limited success in encouraging preparedness efforts by businesses. Incentives need to be developed to encourage private investment in emergency planning, business continuity planning, and other

preparedness activities. Research is needed on issues such as how to create a market for emergency preparedness.

6. The exercise of federal jurisdiction in events involving terrorism raises issues that have been dealt with in other kinds of large-scale disasters. In emergency management, the solution has been to build local and regional capacities to deal with disasters until state and federal resources are available. Investments in training and equipment for local first responders have been a priority. Prepositioning critical resources, such as medical supplies and pharmaceuticals, has also been a priority. The implementation of The National Guard Civil Support Teams to deal with radiological events is one of the measures that has been enacted since 9/11. More research, including policy and program evaluations, would help target resources where they are needed to build local first responder capabilities and where the risk of attack is greatest.
7. The human dimensions of terrorism-related disasters have been far from adequately explored. Research on how people perceive the hazards posed by terrorism, how they interpret the risks, what they know about potential terrorist acts, how they make decisions concerning protective action, and how authorities can influence the public to take appropriate action, including preparation for potential attacks, are some of the questions that need to be answered. The presumption on the parts of officials and the media that the public is likely to panic needs to be dispelled. The disaster literature answers many of these questions in relation to natural and technological disasters, but, evidently, validation may be necessary for the research to be accepted by Homeland Security officials and the media.
8. Effective risk communication is also a serious issue that needs more study. What kind of information does the public need to make decisions concerning evacuation, sheltering in place, and other protective action? How much can be delivered via public education programs and how much can be delivered via alert and warning messages? How much information is needed by the public—certainly large segments of the public want to access such information via the Internet. Disaster research shows that information needs differ, but that adequate, accurate information is essential if authorities wish the public to respond appropriately. The public has to trust those providing the information in order for it to be accepted.
9. Psychological impact is the raison d'être for terrorism. Terrorism is violence for effect, but what influences that effect? What variables affect how people perceive and respond to terrorism? How can the effects of terrorism be mitigated? Are there differences in how people perceive threats and attacks and are the impacts of biological and nuclear threats and attacks greater than the impacts of other kinds of terrorism?
10. If terrorism is different from other kinds of disasters, how is it different and what do the differences mean for recovery? How can societies ensure that individuals, families, and communities recover quickly from terrorist-related disasters?
11. To the extent that terrorist acts may cause catastrophic disasters, much more research needs to be done on long-term recovery issues. The Homeland Security Council's scenarios include the explosion of nuclear and chemical devices which could cause long-term contamination in major cities, displacing thousands of residents. How can large numbers of evacuees be resettled if their communities cannot be quickly cleaned up? Homeland Security and emergency management officials have struggled with issues such as mass decontamination and mass burials, but issues related to long-term housing and employment of evacuees have certainly become major concerns since Hurricanes Katrina and Rita.

12. Surge capacity issues have also been major concerns. The capacities of hospitals and the medical system as a whole to deal with large numbers of casualties are important, but much more research needs to be done on the capacities of local emergency response and emergency management agencies, the National Guard, and the multitude of nongovernmental disaster relief organizations during major disasters. NGOs, from local community groups to national faith-based organizations, represent that nation's capacity to deal with large-scale disasters and more research needs to be done on how to integrate them into disaster operations better.

There are many other questions that need to be answered and research that needs to be conducted to inform policies to deal with the threat and the actuality of terrorist attacks. Fortunately, much is known about managing hazards and dealing with large-scale disasters that is applicable to terrorist events. More open communication among Homeland Security officials, emergency management officials, terrorism and counterterrorism researchers, and disaster researchers would help identify research needs better and improve policies and programs to deal with the risk posed by terrorism.