

# **Business Responses to the World Trade Center Disaster: A Study of Corporate Roles, Functions, and Interaction with the Public Sector**

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## **Introduction**

One of the most prevalent trends in emergency management concerns increased partnerships between the public and private sectors. Initiatives such as the Federal Emergency Management Agency's "Project Impact"<sup>1</sup> and the Institute for Business and Home Safety's "Showcase Community" and "Disaster Recovery Business Alliance" programs are examples of this collaborative effort (Armstrong, 2000; IBHS, 2000). Ironically, research about the roles of the private sector and the functions it performs in emergency management is scarce. Nor is there sufficient information about the interaction of local jurisdictions with each of the organizations that participates in disaster response operations (Waugh, 2000; Erickson, 1999). In particular, there is a lack of findings about the collaboration that takes place among businesses and government agencies to solve mutual disaster problems (Webb et. al., 2000; Mileti, 1999).

Taking into account these trends in the field and gaps in the disaster studies literature, and utilizing the attacks on the World Trade Center on September 11, 2001, as a case study, this paper seeks to answer three important questions. First, what roles and functions do businesses play or perform in emergency management? Second, how does the private sector interact with government agencies during times of disaster? Finally, what are the implications of business involvement in emergency management for both scholars and practitioners? Before proceeding with this analysis, the methods used to gather information for this study will be discussed.

### **Methodology**

Information about private sector roles, functions, and interaction with the government has been obtained from a variety of sources and through various methods. Comments in the next section (regarding the roles of the private sector in emergency management) are based on the combined 18 years of academic and professional experience of the authors of this paper. Each of the authors teaches in the Emergency Administration and Planning program in the Department of Public Administration at the University of North Texas, has interest and specialization in emergency management, and has taught various courses including Emergency Preparedness, Disaster Response, Disaster Recovery, and Private Sector Issues in Emergency Management. One of the authors was previously employed as a County Emergency Management Coordinator and as a Regional Fire Coordinator for the Forest Service in the State of Texas, obtaining first-hand experience in collaborating with both public and private organizations in disaster situations. Another has worked for large corporations in the retail and petroleum industries in California and Colorado, and has observed the behavior of private sector entities in disasters while performing case worker functions for the Denver Branch of the Mile High Chapter of the American Red Cross. This author has arranged several internships with businesses for students interested in pursuing careers in the private sector. The final author served previously as an intern working on Project Impact initiatives with Region IV of the Federal Emergency Management Agency (FEMA) in Chicago, Illinois. He has also spent time in the occupational and safety area with Heritage Environmental (a hazardous materials spill response and remediation company), and interacts frequently with businesses involved in emergency management due to his position as the Professional Development Coordinator in the Center for Public Management at the University of North Texas. These distinct backgrounds have enabled the authors to understand the roles of businesses in emergency management.

Information about the private and public response to the World Trade Center terrorist attack was obtained through a Quick Response grant provided by the National Science Foundation and the Natural Hazards Research and

Applications Information Center at the University of Colorado at Boulder. Immediately after the attacks, the authors identified and contacted potential informants from the public and private sectors who were involved in the response to this disaster. A week later, the authors traveled to the scene and spent several days interviewing people involved in the operations or affected by the disaster. During these interviews, informants were asked a series of questions about the functions they were performing, the successes and failures of coordination across the public/private sectors, and lessons gained about the private sector and multi-organizational collaboration. Where possible and when required, additional open-ended questions were asked to elicit more information or clarify the responses given. At the close of these interviews, the practice of “snowball sampling” was utilized to uncover additional informants and these individuals and agencies were subsequently contacted. Among others, the informants (N=47) included representatives of businesses that were affected, employees and volunteers of corporations that responded to the incident, and public officials from various departments and agencies (e.g., the Mayor’s Office of Emergency Management, Public Works, FEMA, the Office of the Inspector General, etc.).

After conducting this field research, the authors obtained further information and arrived at additional findings by attending emergency management conferences pertaining to the September 11th disasters, and through follow-up e-mail correspondence and phone conversations with the prior interviewees. The authors also relied on internet articles, media coverage, and news clippings to support findings where needed. After reviewing field notes, transcribing the most salient interviews, and discussing the information gathered in a series of meetings, the authors then generated an outline and began writing their findings. Once the initial draft was completed, it was circulated to various informants to verify content and obtain additional insights. The paper was revised several times based on the responders’ feedback and authors’ review of the research gathered. Finally, the paper was peer-reviewed before publication in this volume.

### **Roles of the Private Sector**

Research has typically underscored the problems of the private sector in emergency management. Studies reveal that businesses often contribute to disaster or amplify their adverse effects in a variety of ways. For instance, corporate practices may make people, communities, and nations more vulnerable to natural hazards (Blaikie et. al., 1994). Industry increasingly develops complex systems and relies on high-risk technologies in the production process (Perrow, 1999). And businesses often embrace preparedness measures in a superficial manner and may even intentionally

neglect the need to plan their responses to potential crises and other unforeseen events (Webb et. al., 2000). In spite of these obvious and disturbing weaknesses, it should also be recognized that corporations do play important and diverse roles in emergency management (Table 1). The private sector is involved in volunteer and donation activities, insurance provision, occupational health and safety, risk management, planning for and preventing transportation disasters, emergency medical care, hotel disaster preparedness and sheltering, reporting and information dissemination, business continuity, and the vending of goods and services for emergency management.<sup>2</sup> Each of these areas will be discussed in turn.

**Table 1. Roles of the private sector.**

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Volunteering and donations	Insurance coverage
Occupational health and safety	Risk management
Transportation-accident planning and prevention	Emergency medical care
Hotel preparedness and sheltering	Reporting and information dissemination
Business continuity	Vending of goods and services

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In addition to the concerned citizens, charitable organizations, and government officials/agencies that respond to disasters, the private sector also participates in the typical emergence and convergence process. Employees often serve as volunteers during response operations and companies frequently donate needed supplies and services to disaster-affected communities. For instance, after the 1981 Hyatt Regency skywalk collapse, hotel staff kept spectators away from dangerous debris, removed the wounded from the rubble, and set up a first aid station (Waugh, 1988). In other cases, restaurants donate food to emergency workers while soft drink distributors bottle water for communities with severed water lines. It is also common that manufacturers and discount retailers send diapers, baby formula, clothing, or other necessities of life to affected areas. In addition, home improvement stores such as the Home Depot give victims of disaster lumber, plastic sheeting, and other construction equipment and supplies for temporary or permanent repairs to damaged homes.

Although the government provides some insurance coverage (through the National Flood Insurance Program), it is the private sector that writes the vast majority of policies for fire, wind, hail, earthquake and other hazards. This includes the coverage of residential and commercial properties, personal

vehicles, and the fleets of major transportation firms and carriers. Insurance and reinsurance companies not only help individuals, families, and other corporations recover after disaster by covering losses, they also play a vital role in mitigation by assigning a dollar value to risk; spreading the costs of disaster among a larger population; and reducing vulnerability through education, training, and the safe location of buildings and personal property. State Farm encourages mitigation with its “Good Neighbor House” in Deerfield Beach, Florida. This showcase residence is built with the latest in disaster prevention construction materials and techniques (e.g., impact-resistance glass, lightning protection, smoke detectors, fire sprinklers, high wind shutters, water damage detection equipment, and hurricane straps for the roof).

Since the industrial revolution governments have mandated that businesses address occupational health and safety concerns. Laws have traditionally focused on the length of the employees’ work day and the need for periodic breaks, but attention has also been given to the prevention of slips, trips, falls, back injuries, and industrial accidents involving machinery or heavy equipment. With increasing government regulations and fines for violations, manufacturing firms and related companies have been forced to become more interested in maintaining a safe work environment by means of employee education and training, clean and well-organized factories, safety audits, first aid stations, and access to emergency response equipment.<sup>3</sup> Preventive and planning measures for hazardous materials fires, industrial explosions, and chemical spills are major concerns for occupational health and safety, especially since the 1984 Union Carbide disaster in Bhopal, India. Under SARA Title III (the Superfund Amendment and Reauthorization Act), industries with reportable quantities of lethal chemicals must file Tier II reports to notify fire departments, Local Emergency Planning Committees, and the state agency in charge of environmental protection of the types, locations, and amount of hazardous materials in the facility. Businesses including Texas Instruments, Lockheed Martin, and oil/gas companies also have their own emergency teams that respond to industrial disasters before and in conjunction with public emergency service personnel. Industry is now giving attention to workplace security/violence and possible terrorist attacks on petroleum refineries and other plants that process, manufacture, store, or use hazardous substances.

Many businesses have employees that perform risk management functions. Risk management includes activities directed towards the goal of protecting the monetary and other interests of the company. Risk managers familiarize themselves with the hazards associated with the workplace and are aware of the potential for lawsuits resulting from the operation of the business. They also purchase insurance policies to limit the financial liability of the company. Consequently, risk management is closely related to the

insurance industry and the goals of occupational health and safety. In some ways, risk managers are similar to emergency managers in that they attempt to prevent and prepare for crises and disasters. Risk managers may even represent their companies as members of the jurisdiction's Local Emergency Planning Committee.

Transportation firms have always played emergency management roles. Companies that operate ocean vessels attempt to steer clear of adverse weather, and have often provided assistance to ships in distress (e.g., the *Carpathia* rescued those that survived the sinking of the *Titanic*). In the transportation sector, railroad companies are required by law to complete a "consist" (shipping manifest) that acknowledges the amount and type of hazardous materials above the reportable quantity. They may also have their own teams of employees that respond to derailments to ensure a quick recovery of normal operations. Similarly, trucking companies such as SAIA Motor Freight often have their own personnel that investigate vehicle accidents and clean up hazardous materials spills according to state and federal environmental and transportation policies. Aviation firms promote the safety of passengers through the maintenance of planes and the training of pilots and crews. Airlines are also required under the Aviation Family Disaster Assistance Act of 1996 to plan and prepare for aviation crashes. Responsibilities include information dissemination, body identification, and psychological counseling.

There are numerous companies involved in emergency medical health care as it relates to disaster. Before an event, hospital administration and staff meet with community leaders to plan and prepare for earthquakes, hazardous materials spills, terrorist incidents,<sup>4</sup> and other disasters that may involve large numbers of victims. When an emergency or disaster occurs, ambulance companies—many of them privatized (e.g., Rural Metro in Scottsdale, Arizona)—dispatch emergency medical technicians to practice triage, care for the wounded, and transport victims to nearby hospitals. Hospitals, in turn, must treat the large numbers of patients that are self-referred or arrive by ambulance or with friends or family. At times, hospitals must also protect or evacuate patients if their facilities have been directly affected by the disaster agent(s).

The tourist industry is becoming more involved in emergency management activities (Drabek, 1994). Fires such as the one that occurred at the MGM Hotel in Las Vegas in 1980 have compelled hotels to better prepare for emergency situations. For example, Marriott has its own Crisis Management and Business Continuity division. Hotels also have policies and procedures relating to warning employees or guests of potential disasters, and even serve as places of refuge for those who have evacuated due to unfolding disasters and other emergencies. These preparedness measures are necessary since hotels are often located in vulnerable areas (e.g., along the coast) and

because the size and occupancy of many hotels have risen dramatically over the past few decades. Hotels often establish agreements with the American Red Cross to shelter victims in times of individual, family, or community disaster.

Media organizations, such as newspaper, radio, television, and cable companies, are also heavily involved after disaster strikes. These organizations send reporters en masse to the scene of incident to obtain interviews as well as audio and/or video footage. Once this information is compiled, organized, and edited, it is distributed in print, via the internet, over the air waves, or on the screen. Much of this news reporting and commentary will focus on what happened, why it occurred, and what the effects were (Scanlon et. al., 1985). In many cases, the information provided will be incomplete or inaccurate (Payne, 1994). At other times, media representatives may get in the way of first responders (Scanlon et. al., 1985) and the coverage will reinforce widely held disaster myths (Fischer, III, 1998). Regardless of these problems, the media is a valuable conduit for government officials to spread important information about what citizens in the affected community can do to protect themselves or where they can go to receive disaster assistance.

As a result of the at-times alarming number of businesses that fold after disaster,<sup>5</sup> corporations are becoming increasingly involved in mitigation, preparedness, response, and recovery activities. For instance, a brewery in California spent an impressive amount of money to shore up equipment to prevent it from tipping over in the event of an earthquake. It is estimated that these measures saved the company millions of dollars when the Northridge earthquake struck a short time later. Businesses are also increasingly involved in continuity planning. Business continuity planning includes the identification of vital operations, the potential negative impacts of disaster, and methods to help the corporation run in spite of fires, floods, or other catastrophes. In many cases, computer experts, technology, and plans are relied upon to back up files, maintain communications, restore the operation of advanced industrial equipment, and resume normal business operations. The private sector therefore appears to be reacting positively to the rising quantity and toll of disasters and is expected to embrace these efforts even more closely in the future. However, many smaller businesses do not participate in these endeavors because they lack human and material resources.

The private sector is also a major provider of goods and services for emergency managers and other businesses, organizations, or communities in need of equipment and technical expertise. For instance, Halff Associates and Dewberry & Davis are corporations made up of engineers, architects, planners, and others that consult with governments on ways to incorporate

mitigation into major development, infrastructure, and transportation projects. Federal Flood maps floodplains in conjunction with the National Flood Insurance Program to determine appropriate insurance rates. Simpson Strong-Tie Co., Inc. manufactures connectors that are used to strengthen wall, floor, and roofing joints against severe wind hazards. ENPRO is a distributing company that sells window film products to make glass more resistant to strong winds, terrorist bombings, and other hazards. The Institute of Business and Home Safety helps families and corporations prevent accidents and prepare for disasters. SAIC works with governments and businesses to assess risks and write plans to mitigate or respond more effectively. High Sierra Electronics, HI-GO, and American Communications manufacture and sell weather warning stations, dam and reservoir monitoring systems, weather alert radios, tornado warning sirens, and communications equipment in first-responder vehicles. Other vendors sell or rent sand bags, personal protective equipment, generators, computer aided decision support systems, and other supplies for first responders and those working in emergency operations centers. Emergency & Disaster Management, Inc. trains officials and staff at airports to deal with major aviation incidents. Cura Emergency Services and Hulcher Services are companies that respond to hazardous materials spills on highways and railways respectively. DRC, Inc. provides logistical support during response by providing labor, workforce housing, potable water, and other items. Phillips and Jordan is a company that contracts with government agencies to remove, burn, and dispose of debris and animal carcasses left in the aftermath of disaster. Verizon, ConEd, and other utility providers restore phone, electric, gas, and water infrastructure systems that have been rendered inoperable due to the powerful forces associated with hazard agents. BMS Catastrophe is well known for its ability to restore buildings and office equipment after major floods and fires. Parsons Brinkerhoff works with FEMA to verify structural damage resulting from disasters and estimate the likely costs for repairs. Numerous contractors and builders also descend on disaster-affected areas to restore damaged buildings or rebuild entire communities.<sup>6</sup> Thus, it is evident that the private sector plays varied and vital roles in emergency management.

### **Private Sector Involvement in the September 11th Disaster**

The September 11th disaster at the World Trade Center required significant private sector involvement as well as close coordination with officials and agencies in the public sector. Functions performed by the private sector and in conjunction with public officials included warning and evacuation, Emergency Operations Center relocation and management, emergency operations at Ground Zero, mitigation of additional terrorist attacks, perimeter control and law enforcement, security and medical staffing, logistical support



of urban search and rescue teams, information dissemination, communications, and infrastructure repair. Other functions included building restoration, sanitation services, business relocation and resumption, disaster assistance and insurance coverage, mass fatality management, debris removal, transportation assistance, donation management, and equipment repair and replacement.

### **Warning and Evacuation**

Although there was no specific and credible warning that terrorists would hijack a plane and fly it into a building, there was concern that a similar event could recur at the south tower of the World Trade Center after the north tower was hit. For this reason, occupants of the south tower were advised to leave the building while others left voluntarily. However, other announcements inside the south tower instructed people that it was safe to return to their offices because the attack only occurred at the north tower. Although not everyone obeyed this latter announcement, many people remained in the building or returned to work when the second tower was hit. When the south tower collapsed at 10:05 a.m., the fire chiefs decided that the north tower would also be in jeopardy of structural failure. Fire officials therefore worked with businesses and employees to evacuate it. In both of the 110-story towers, virtually all of those working on or above the floors impacted by the airplanes were unable to evacuate. These, and other people in or near the buildings, were killed by fire or subsequent collapses. As of June 24, 2002, 2,823 people (including 403 emergency workers) lost their lives, were still missing, or had been issued death certificates. Nonetheless, the design and construction of the buildings, in addition to the adequacy of well-lighted stairways and prior evacuation training exercises involving businesses in the World Trade Center complex, allowed thousands of workers to exit the buildings safely. During the 1993 World Trade Center bombing, complete evacuation took 11 hours as stairwells were dark, carry-chairs were not available for the physically disabled, and coordination between emergency responders and tenants was less than perfect. Many of those issues were addressed after the 1993 incident, and undoubtedly increased the speed and effectiveness of the evacuation on September 11th.

### **EOC Relocation and Management**

The public and private sectors also interacted closely in the Emergency Operations Center (EOC). As the devastating impact of the terrorist attacks became apparent, the city emergency management staff decided to evacuate the EOC (which was located in World Trade Center building 7). This proved to be a wise decision because the collapse of the north tower damaged building 7 and resulted in the building's being gutted by fire. Within a surprisingly short time, the city obtained office space at Pier 92 on the

Hudson River to establish a new EOC. Manufacturers donated necessary electronic office equipment (including computers, printers, and fax machines) and utility companies were sought to establish sufficient phone lines for the new facility. Once the EOC was operational, volunteers from the private sector arrived to help in any way they could (e.g., providing food or running errands). Public officials and representatives from various corporations (including those from the World Trade Center) met periodically to coordinate response priorities and operations. When personal meetings could not be arranged, phone calls took place between the EOC staff and company leaders. It is generally felt that this coordination was effective. Prior meetings between the EOC staff and local business continuity planning groups were credited for the successful improvisation and management of the EOC.

### **Ground Zero Operations**

Various functions had to be performed at Ground Zero, including damage assessment, search and rescue, and evidence collection. To facilitate these operations, a geographic information system (GIS) database was established and the affected area was divided into 75-foot quadrants. Emergency personnel were then assigned to individual grids and briefed before they were put to work. This training provided an update on the situation with reference to secondary hazards such as hanging debris and unsafe wreckage. LIDAR (light detection and ranging) was utilized to detect ongoing fires as well as voids and potential shifts in the debris pile. Experts from MAPINFO arrived in New York to assist with the GIS. The data entry required a significant amount of input from the private sector. In addition, E-TEAM software was used to provide situation updates on the location and assignment of resources (e.g., staging areas, food, ice, water, restrooms, and personnel). Because over 200 organizations were involved in the response, frequent updates on the resources being deployed by the private sector were required.

### **Mitigation of Potential Future Attacks**

Almost immediately after the unfortunate events unfolded on the East Coast of the United States, the Federal Aviation Administration (FAA) ordered all planes to be grounded to avert the occurrence of similar terrorist attacks elsewhere. This precautionary step required close collaboration between the government, airports, and individual airlines. At the same time, the Federal Bureau of Investigation (FBI) contacted the airlines involved in the attacks in order to obtain thousands of manifests (passenger lists) to assist in the identification of the terrorists involved and gain information about other possible hijackings. Later on, the FAA worked with airports and airlines to resume flights and implement new security measures. Both the cancellation and resumption of flights posed incredible logistical challenges in that planes

were diverted away from their destinations and flight crews were unavailable (e.g., some rented cars and drove home to be with their families while others were reluctant to return to work). Periodic conference calls between the FAA and airline officials took place as they slowly brought the system back to full operation. The implementation of new security measures was also troublesome. Airlines had difficulty absorbing and communicating new security policies to employees, as the FAA issued new policies almost daily. Nonetheless, it is believed that the FAA and airlines worked well together in spite of the difficult situation with which they were presented.

As these activities were taking place, federal, state, and local officials thought it necessary to increase security in New York City. Police presence was increased in the subways, on the streets, in the harbor, and at government buildings. A major concern was the vulnerability of government buildings to vehicle-delivered bombs. While the local government had an existing program and schedule for installing fixed, retractable, and removable bollards (metal and concrete barriers) in front of buildings, there was a desire to speed up the process. Local officials contacted Secure USA within two weeks after the incident to increase orders and accelerate the installation. While the coordination between the public and private sectors was adequate, budgeting issues got in the way and slowed down the process. Nonetheless, the public sector relied heavily upon this business to increase security after the September 11th disasters. The private sector therefore performed important security functions and collaborated closely with the government to implement security policies before and after the events of September 11th.

### **Perimeter Control and Law Enforcement**

One of the major challenges after the collapse of the World Trade Center buildings was to control access to affected area. In the immediate aftermath of the disaster, police escorted business owners into the affected area and allowed them to survey damage, collect needed documents or goods, and start processing insurance claims. However, emergency management officials desired to keep all non-essential persons out of the area for health and safety reasons. In addition, it was also believed that the presence of people at the disaster scene would slow down important response and recovery functions, and pose a potential security threat (as terrorists could blend into the crowds and attack emergency personnel). Consequently, a perimeter was established a few blocks away from and surrounding the impacted area. Fences were acquired from National Rent-a-Fence. A security check-in station was set up and a policy was established that detailed who would be allowed into the area and for what purposes. It was noted that these measures posed a few problems as some employees from various businesses (e.g., those affected and others involved in recovery activities) had valid reasons for getting in to the

restricted area. Therefore, exceptions had to be made so that the response and recovery operations could proceed. What is more, the process of checking people in was slow and cumbersome at times. Within a few days, executives in the private sector contacted the EOC directly to ask for bulk credentialing. This sped up the security check-in process and improved the coordination among those at the check-in point, the EOC, and businesses.

The terrorist disasters in New York created an atmosphere conducive to potential and actual looting, disaster assistance fraud, and other criminal behavior. The collapse of the World Trade Center towers and other nearby buildings resulted in a situation in which classified documents, precious metals, and even weapons were accessible to those working at Ground Zero. In addition, the stores in the malls under the World Trade Center could not be secured due to damaged doors and shattered windows. For this reason, private security guards were hired to protect the interests of companies and businesses in the vicinity. Representatives from the FBI and Office of the Inspector General arrived at the scene to deter potential criminal activity. In some cases, this meant that government law enforcement personnel coordinated with the private sector to patrol Ground Zero, nearby businesses, and the malls underneath the World Trade Center. While research has consistently reiterated that deviant behavior is infrequent in the overwhelming majority of disasters, there was some looting during recovery operations at Ground Zero. According to a representative of the Office of the Inspector General, some of the steel (valued at hundreds of thousands of dollars) from the World Trade Center towers had been diverted in the debris removal process to be resold on the black market. The Office of the Inspector General therefore worked with debris removal contractors to install global positioning systems on heavy equipment to monitor the mileage, location, and timing of trucks hauling debris from the site of the disaster. Law enforcement officials also worked at other locations (e.g., the debris collection point to prevent theft of victim belongings) and with the private sector (to deal with fraudulent practices relating to the disaster assistance process).

### **Security and Medical Staffing**

Finding an adequate number of personnel to fulfill certain critical functions, such as site security and medical care, was a significant challenge in the disaster. After the incident, police worked 12-hour shifts (or longer) each day to control access to the affected area. Their goals were to keep curious citizens away from dangerous debris and prevent their interference with response operations. Because the restricted zone extended several blocks in every direction from the World Trade Center complex, a sizable force was needed. Law enforcement officers from across the state were brought to New York City to augment the local police contingent. Additionally, officers from

other states as far away as Florida and Texas were allowed to work side-by-side with New York City police. All of this kept police from performing other more routine tasks. The Governor of New York therefore called out the National Guard on September 22, which included scores of reservists. This affected a number of businesses in the New York area, most of which were more than willing to see Guard personnel answer the call to serve.

Hospitals also needed help in dealing with the large numbers of patients needing specialized care, such as burn victims. Like police officers and other emergency responders, medical personnel worked long hours to tend to their patients. In some cases, shelters were set up to provide housing for medical personnel who did not have time to go home between long shifts. The Salvation Army operated one such shelter for the employees of St. Vincent's Hospital. When a hospital's staff could not fill the demand for specialists, they made requests through the emergency management network and specialists from other jurisdictions were brought in to work for up to two weeks at a time. The facilities from which these employees came were willing to absorb the overtime and scheduling hassles to fill in for the personnel who went to New York. Unfortunately, the expected influx of patients never materialized; most of the disaster victims were killed immediately when the towers collapsed, and very few were found alive and in need of medical care.

### **Logistical Support of USAR Teams**

Even though urban search and rescue (USAR) teams are intended to be self-sufficient for the first 72 hours, they must be assisted in various ways when disaster strikes. During the September 11th response, USAR teams were housed at the Jacob K. Javits Center in Manhattan. The Javits Center is a convention center that normally hosts a wide variety of events that were simply rescheduled or canceled in the weeks immediately following September 11th. The facilities of the Javits Center proved to be adequate for the needs of the teams it served. Nonetheless, the provision of food and other supplies for the many USAR teams was quite a burden and a wildland fire hotshot crew was called up to assist with the task. Although the Manhattan landscape was quite different from the mountains of the western United States, good coordination among all involved ensured that the tasks were accomplished. The American Red Cross, the Salvation Army, and other volunteer agencies assisted with the meals. Some local restaurants also provided bulk orders of food to be picked up by response personnel. In some cases, customers waited to be served until the large orders were filled for USAR personnel (as was the case at Starbucks Coffee). What is more, many local restaurants refused to accept any payment from emergency personnel who ate at their locations. Others donated thousands of meals to be served to the responders at facilities around the area, including a cruise ship docked

at Battery Park. The staff for food preparation and delivery was largely made up of volunteers from the food service industry who wanted to do something to help with the response.

### **Information Dissemination**

Disseminating information to the community and affected persons (such as employees and renters) was vital during the response to the September 11th disaster. Government officials needed to let the public know how to respond to the events, what they could or should not do to help victims and responders, where the restricted zones were on any given day, how to find out about lost loved ones, and where to go for disaster assistance. Coordination between the public and private sectors was critical. For instance, reporters from the print, radio, television, and cable media met with public officials frequently and at various locations to obtain updates on the situation. Although there were significant discrepancies in terms of the reported number of lives lost, emergency management officials thought that the role of the media in the performance of this function was crucial. In fact, one official observed that the government could not handle public relations issues without the private media.

Employees affected by the incident, as well as their families, looked for up-to-date information regarding the status of the businesses, employee welfare concerns, paycheck information, insurance coverage, and many other issues. Many of these companies relayed this information to employees via recorded telephone messages. Once the contact number was communicated to all employees, the employer needed only to change the recording that callers would hear in order to keep all employees abreast of the latest developments. Some companies appeared to have had information lines available before the incident, while others used lines that were previously assigned for different purposes. Each of the private sector businesses surveyed handled this function on its own.

As already mentioned, site security was a major concern and a wide security perimeter was set up. In addition, the air was filled with hazardous particles that hindered breathing. These factors led to the shutting down of the housing stock near the World Trade Center. According to a few of the apartment dwellers who were interviewed, there was virtually no attempt by the public sector to communicate with tenants in lower Manhattan apartment buildings. They indicated that the only parties with whom the public sector agencies communicated were building superintendents and owners. Therefore, many tenants did not have information about the status of their housing in the immediate aftermath of the disaster. This lack of information probably

resulted from a failure of landlords to communicate with tenants, rather than government officials failing to communicate with building owners.

### **Communications and Infrastructure Repair**

The World Trade Center disaster resulted in a massive failure in communications and a loss of important utilities. The World Trade Center provided cellular telephone antennas and other communications infrastructure for the downtown area. When these buildings collapsed, 10 cell sites were destroyed (Moss and Townsend, 2001). The World Trade Center also lost hundreds—if not thousands—of hard lines (perhaps a number of switches equal to that used by a city the size of Cincinnati) (Moss and Townsend, 2001). Street-front businesses near Ground Zero were unable to accept credit cards, as phone service was still not working several weeks after the event. A manager mentioned that the inability to accept this form of payment was detrimental to business. In light of these problems, Verizon repair vehicles could be seen throughout the lower Manhattan area. In addition, a communications company provided cell phones for emergency workers, government officials, disaster victims, and anyone else who needed to make a call. The company also brought in charging units and established several portable cell towers to meet the demand near Ground Zero. This was arranged in conjunction and with the input of government leaders.

Getting the infrastructure restored was a massive and critical function after the disaster. The restoration of water, electric, and gas service required the participation of numerous public and private organizations. Many of these projects were extremely large and labor intensive. For instance, ConEd installed approximately 20 miles of shunting for electrical service (Berkowitz, 2001). Water and gas restoration proved to be equally challenging. The restoration of these and other utilities required close coordination between public organizations and the utility companies themselves. Access, timing, engineering concerns, and traffic control were only a few of the factors that had to be addressed so that utilities could be restored in the most expeditious and effective manner possible.

### **Building Restoration**

The fires in the towers, and the collapse of these and other buildings, did not only affect the World Trade Center. Instead, the resulting debris and dust cloud impacted a large number of buildings in lower Manhattan. For instance, ash was several inches deep inside the buildings nearest Ground Zero. Even buildings blocks away had dust particles in their elevator shafts or heating, ventilation, and air conditioning systems. For this reason, facility restoration became a top priority for many public agencies and private corporations. Almost immediately after the incident, restoration companies began

converging at Ground Zero. Executives from BMS Catastrophe—perhaps the nation’s largest and most respected restoration company—arrived in New York on September 12. Over the next several weeks, as many as 800 employees worked for BMS Catastrophe to remove the contaminants from scores of buildings on Wall Street and in and near the World Trade Center complex. Many of the facilities requiring restoration assistance had existing contracts with BMS Catastrophe. However, other work was initiated by BMS Catastrophe as knowledge of its services spread by word of mouth to tenants or building owners. While most of BMS Catastrophe’s involvement was directed towards the private sector, its personnel did interact and coordinate with government agencies and officials. BMS Catastrophe obtained approval from the FAA to fly a private jet to New York on September 12 even though the President had grounded all aircraft. Before BMS Catastrophe could work, it also needed permission to enter the restricted areas in and surrounding Ground Zero. It therefore provided a list of employees to the Office of Emergency Management and the Department of Design and Construction (which were in charge of site security). Workers were thus allowed access when they checked in to begin the cleanup. In addition, the company worked closely with the Department of Sanitation. Because electricity was lost in a vast number of buildings in lower Manhattan, food was spoiling in many refrigerators. The Sanitation Department asked BMS Catastrophe to remove the food that was posing a health threat. The Chief of the Sanitation Department then asked BMS Catastrophe executives to meet him at 6:00 a.m. one day so that he could personally escort the employees through the checkpoints to the work area. Scott BaVier, Vice President of BMS Catastrophe, commented that the Sanitation Chief “was very cooperative.” This close contact between the public and private sectors proved invaluable for facility restoration.

### **Sanitation Services**

In light of the destroyed utility infrastructure and because of the massive influx of emergency workers and other responders into lower Manhattan, there was a large need for portable sanitation units. The Mayor’s Office of Emergency Management, American Red Cross, ConEd, FEMA, and others contracted with Mr. John to provide 750 toilets at Ground Zero, staging areas, bridges and tunnels, the landfill, and at other locations (e.g., the company provided a number of sanitation units free of charge for the ongoing funerals for fire fighters and police officers). In addition to working with public officials to arrange the terms of the contracts, the company coordinated with the Sheriffs Department to escort the sanitation units in from New Jersey. The company also worked with government agencies to identify the locations that needed the units and to obtain vehicle permits that would allow the company



to enter the area. One major problem that arose was the dynamic nature of the road closures. In many cases, Mr. John would attempt to drop off a unit only to find that access into the area had not been approved, and would have to wait until the proper permits could be granted. In another case, no one at Ground Zero knew where the units were to be placed. Regardless, Mr. John representatives reported that everyone was cordial and helpful, and did the best they could to resolve the situation for the company.

### **Business Resumption and Relocation**

Business continuity was a top priority after the disaster. Issues for corporations included the inability to operate, employee relations, expense concerns, city ordinance enforcement, facility relocation, and record retrieval. Because offices were destroyed, damaged, or dirty, and since roads were closed and security was tight, many corporations could not reopen for business in a timely manner. Consequently, many employees were not able to work during this time and suffered the resulting loss of income. At other times, businesses did not know when to tell employees to return to work because of the astounding degree of disruption caused by the disasters. Alternatively, some businesses needed additional employees or required their staff to work overtime in order to clean or relocate their facilities. This was also problematic in that many businesses had little or no revenue coming in to pay for these expenses.

Another important issue after September 11th pertained to the enforcement of emergency ordinances intended to limit the number of sightseers clogging the streets in lower Manhattan. The goal of such ordinances was to aid both response efforts and recovering businesses, and to show sensitivity to the victims of the disaster and their families. None of the businesses interviewed indicated that they had input into the ordinances. However, almost all supported them and wanted to see them strongly enforced. The businesses wanted the crowds on the sidewalks to be dissipated or forced to move on even though they also needed customers in their shops and offices. Nonetheless, many respondents felt there was a lack of enforcement of ordinances. In addition, those that were enforced were done so in an inconsistent manner with no apparent method for determining when they should be enforced (e.g., picture taking was not permitted at first but was allowed later).

Relocation proved to be another major concern for businesses. Approximately 20 million square feet of office space was taken from the downtown area when the towers collapsed. This left an impacted area roughly the size of Atlanta's central business district. Therefore, obtaining space for businesses located in and near the World Trade Center area was an important part of the recovery process. Many firms had to find new office space, as their

previous facilities no longer existed. In these cases, there was much variation. One business person stated that her company rented 102,000 square feet of office space in midtown Manhattan on September 17th, just six days after the event. Others struggled with relocation for several weeks after the disaster. Many of these relocating businesses were absorbed into different areas in the New York metropolitan area. Midtown, Jersey City, Stanford, and Westchester were all areas that received displaced companies. In several instances, even competitors opened their offices and shared space to help speed the recovery process. Other businesses moved to temporary offices created in hotel rooms throughout the city. It is unclear how much coordination occurred between the public and private sectors regarding this relocation. Several informants said they were sure that the leaders of their company must have talked to some public sector agencies, but they had no real knowledge of this type of coordination occurring. Thus, businesses often took care of themselves by relying on the market forces of supply and demand, or the good will and generosity of others in the private sector.

An additional challenge for businesses involved the availability of vital records. Some companies were able to rebound immediately as their corporate data was backed up at off-site facilities around the nation. In these cases, only the work in progress was lost when the towers collapsed. Other companies were not so fortunate. They either did not back up their information, or the alternate storage facilities were located in nearby World Trade Center buildings. These companies are struggling to recover to this day. The retrieval of data did not, to our knowledge, involve the services of the public sector.

### **Disaster Assistance and Insurance Coverage**

The private sector was involved in the disaster assistance process. For example, the airlines affected by the hijackings provided disaster assistance to the families of deceased passengers, including information, psychological counseling, and other forms of aid. Nonetheless, most of the disaster assistance came from FEMA and other government entities such as the Small Business Administration. This assistance was directed toward citizens or the private sector and was provided to help repair physical damage and/or provide working capital. As of June 20, 2002, the SBA had provided 3,550 loans in Manhattan for a total of \$390,642,300 (375 were to residential condominiums and co-ops, and 3,175 were for other private companies). While much of this assistance was closely coordinated, other aid was not. Some businesses affected by the disaster noted that they received flyers from Congressional representatives announcing a meeting to be held at a nearby university to outline the requirements of disaster assistance programs. Federal representatives stated that a number of outlets were used to disseminate information about loans and aid programs. Mayoral announcements,

six disaster recovery centers, assistance from the Empire State Development Corporation, television spots, press conferences, publications, newspapers, and outreach programs (door-to-door) all were used to get information to businesses and residents. However, some of the businesses interviewed did not hear from the government or about any assistance programs; they did not know where to turn for help.

In order to facilitate recovery, the Lower Manhattan Development Corporation (LMDC) was created (as a subsidiary of the Empire State Development Corporation) to assist in redeveloping the downtown area. The U.S. Department of Housing and Urban Development provided LMDC with a \$2 billion community development block grant. LMDC offers financial assistance and incentives in order to retain individuals who currently live in lower Manhattan and to encourage others to move to the area. The LMDC also provides job training assistance to help those preparing for employment in lower Manhattan. The organization therefore played important roles in helping businesses return to normalcy after the disaster.

Congress also approved an aid package involving millions of dollars of grants for the airlines affected by the September 11th incidents. The airlines insisted that they could not survive the economic impact of the terrorist attacks, lower passenger numbers, and possible post-September 11th lawsuits without federal assistance. A victims' compensation fund was therefore established and intended to make cash payments to victims and families at the expense of the federal government. In order to qualify for these federal payments, victims and families had to waive all rights to sue in federal or state courts. The overall success of this federal effort to help and protect the airlines remains to be seen as few families have signed the necessary waivers and a few lawsuits have begun to emerge.

Insurance companies similarly played a major role after the disaster. Companies sent scores of adjusters into the affected areas to deal with the huge numbers of claims. In some instances, insurance adjusters completed their jobs without interacting with officials from the public sector. However, the State of New York had set up a Disaster Coalition six months earlier. Modeled after the Institute for Business and Home Safety coalition during Hurricane Andrew, it included the New York Department of Insurance, the New York Department of Emergency Management, the New York Insurance Association, several insurance companies, and FEMA (Ryland, 2002). The coalition held a tabletop exercise during the summer of 2001, which is credited for facilitating the collaborative and successful public/private response to the World Trade Center disaster.

A few minor problems emerged during recovery, however. Insurance companies had to access the disaster scene after damaged buildings were inspected by engineers. This proved to be difficult at times due to the tight security. Another major challenge that insurance companies had was

determining if the disaster would be covered or if it would fall under the “act of war” exclusion. Some companies covered losses while others are still determining what should be done, if anything, for their clients. It is likely that this will result in a number of prolonged lawsuits in the future. Another problem surrounded insurance coverage for those working at Ground Zero. In this case, the private sector was hesitant to provide coverage in light of the potential for additional terrorist attacks and danger involved in the response and recovery operations. The government did allow the contractors to begin operations before the normally required insurance policies were in place.

### **Mass Fatality Management**

The World Trade Center disaster was one of the largest mass fatality incidents in the history of the United States. Not only did the plane crashes and resulting structural collapses kill thousands of people, but the process of body removal and identification was difficult in that there was simply no trace of many victims due to the intense heat from the burning jet fuel and nature of the building collapses. Consequently, the confirmed number of dead is low and is still being revised to this day. The private sector was a valuable asset to the government in the management of the large number of fatalities. For example, public officials communicated with the airlines involved in the terrorist attack, businesses in the World Trade Center, and local hospitals (the Greater New York Hospital Association) to develop lists of the missing and presumed dead. Private corporations and mortuaries also participated in body identification and fatality management. Conversely, the government was also considered to be a valuable asset to private corporations. Airlines referred the families of victims to the New York City website to inform them about the process of acquiring death certificates. Most of the activities surrounding fatality management witnessed collaboration across sectors. For instance, the Associated Press, the *New York Times*, CNN, and Kinko’s helped to disseminate information about victim identification. However, fire department personnel confronted police when private contractors were allowed to bring in heavy equipment to speed up the debris removal process; they were concerned that the remains of their comrades would be removed in an insensitive manner.

### **Debris Removal**

As already mentioned, the use of airplanes as weapons resulted in the collapse of both the north and south towers of the World Trade Center. However, the twin towers were not the only buildings destroyed in the incident. As they collapsed, steel and other building materials fell on top of or into nearby buildings. This created additional structural failures and spread fire across the World Trade Center complex. As many as 10 major buildings were destroyed

or damaged, leaving behind estimated 1.2 million tons of debris. With this enormous amount of rubble before them, government officials designated the Design and Construction Department as the lead agency for debris removal. This government department then divided the 16-acre World Trade Center site into quadrants and signed agreements with four contractors. In turn, scores, if not hundreds, of subcontractors were utilized to assess debris stability and voids, monitor safety, cut steel beams, remove and load debris, and haul it away for further processing including investigation, disposal, and recycling. Such a massive undertaking required the close collaboration of the public and private sectors. For instance, heavy equipment such as grapplers and dump trucks had to be acquired from businesses around the nation. Some corporations donated the use of 750-ton cranes for the operation. Moreover, ingress and egress routes had to be determined by public officials and communicated to the companies involved in the debris removal. The military and police also searched all vehicles involved in debris removal to ensure that bombs would not be delivered to Ground Zero. Trucks had to be hosed down before leaving the area to limit the transport of dust to other areas. Although all of this proved to be a major logistical nightmare, it is believed that the coordination of this function was exceptional. In fact, the debris was removed at a much faster pace than was originally anticipated (by May 2002).

### **Transportation**

All forms of transportation in the Manhattan area participated in the response or were affected by the terrorist events. When the terrorist attack occurred, thousands of people evacuated Manhattan by ferry. Others utilized the subway system and taxis to leave Ground Zero. Later on, USAR teams relied upon large buses to move from the Jacob Javits Center to Ground Zero and back. As the response continued, the airline industry became heavily involved. To assist with the efforts in New York City, several carriers provided reduced fares to workers and volunteers who responded. Additionally, airlines provided flights to the families of victims to assist them in obtaining death certificates and receive psychological counseling. Transportation in and around Manhattan was severely affected by the disaster and ongoing response operations. Initially, the city government closed the downtown area south of 14th Street. Roads adjacent to the World Trade Center were also shut down and vehicle and pedestrian traffic was altered to expedite the removal of debris from the area. Local government conveyed this information to the private sector periodically so transportation companies would be aware of the street closures. The private sector therefore provided transportation services during the response and the public sector collaborated with businesses to coordinate traffic detours after the disaster.

### **Donations Management**

Donations management is a constant concern for the agencies involved in disaster response. Because of the altruistic nature of the American society, citizens will respond by sending goods and supplies to the scene of disaster. This was certainly the case with September 11th as an unbelievable outpouring of relief arrived in New York City. Many of the donations were provided by the private sector. For example, a manager of a sporting goods store mentioned how first responders used his store for protection when the buildings collapsed. The manager then provided swimming goggles and socks to help the responders equip themselves in order to continue their emergency response. The U.S. Forest Service received containers of coffee from Starbucks for personnel at the USAR staging area. Likewise, the personnel at Ground Zero dawned overalls and other protective equipment provided by various manufacturers. Respirators and mask cartridges were given to responders to alleviate breathing problems created by fire, smoke, and unknown particulate matter. Gloves, batteries, and other supplies were sent by private companies. In many cases, the donations were closely coordinated with officials in the public sector. There were other instances in which unneeded supplies were given, however. For instance, Veterinary Medical Assistance Teams were sent dog food that could not be given to the animals participating in search and rescue operations. This lack of coordination was especially apparent in the area of financial donations. Citizens and corporations alike sent hundreds of thousands of dollars to the American Red Cross to help victims and fund the agency's response. Because this pool of money was so large, the Red Cross decided against using all of the money on the September 11th victims in order to have sufficient reserves for future disasters. This resulted in an outcry from the public and a Congressional review of the use of donations by this non-profit organization. The Red Cross has since undergone a change of leadership and revised its policy regarding the use of financial donations by citizens and corporations.

### **Equipment Repair and Replacement**

The September 11th disaster resulted in a massive loss of equipment owned and operated by the Fire Department of New York (FDNY). It is estimated that the emergency vehicles destroyed in the incident included at least 10 ambulances, two Emergency Medical Service Suburbans, 24 sedans used by staff chiefs, 17 Suburbans used by battalion chiefs, two heavy rescue units, one tactical support rescue unit, two high-rise units, four hazardous materials vans, one self-contained breathing apparatus unit, two road-side emergency trucks, 18 ladders, and at least 28 pumpers. In light of these losses, private and public organizations worked diligently to meet the needs of the FDNY. For instance, Seagrave Fire Apparatus sent employees to New York to work

with city mechanics to repair 76 damaged fire engines. Fire departments from around the country asked that their orders be delayed to speed up the delivery of emergency vehicles to New York. Many companies that manufacture fire equipment donated emergency vehicles to the FDNY. As an example, Pierce-Kenworth worked with 70 other manufactures to donate an air and light support rescue vehicle to New York. A similar gift was provided by Emergency One and other donors. Seagrave received a \$25 million contract to build 54 units for the FDNY, however. It therefore requested the support of the labor union, mayor, and citizens of Clintonville, Wisconsin, to speed up production of this equipment. The company communicated with the FDNY to receive the finished vehicles and continues to produce those that remain to be built. The September 11th disaster therefore showed that the private sector is a major supplier of emergency vehicles to the public sector.

### **Discussion and Conclusion**

This study of private sector involvement in the September 11th disaster provides several important lessons and implications for researchers and practitioners alike. While these findings should be regarded as preliminary in nature, they may have significant impact upon the future of emergency management theory and its application.

- It is apparent that the private sector plays both vital and varied roles in emergency management. In fact, it is not an exaggeration to state that the contributions of businesses in mitigation, preparedness, response, and recovery activities have been woefully underestimated.
- The private sector interacts frequently with the public sector to fulfill necessary community disaster functions. Therefore, the lines between the public and private sectors appear to be blurring, disappearing, or perhaps even artificial.
- The public sector relies heavily upon the goods and services provided by the private sector. Many functions, such as public information, debris removal, and emergency medical care, could not be adequately performed without the assistance of the private sector.
- Coordination issues surrounding site security proved to be a major challenge during the response to the September 11th disaster in New York City. Check-in procedures for contractors should be streamlined (especially at terrorist incidents which require stringent site security).

- Numerous factors facilitate coordination among the private and public sectors. Previous disaster experience, planning meetings, mock exercises, communications equipment, and a willingness to cooperate were mentioned as variables that promoted close collaboration after the terrorist attacks.
- Much more needs to be known about businesses in disasters. For example, what other roles did businesses play in the response to the September 11th disaster? Were there additional functions performed by corporations than those revealed through this project? Do other types or locations of disaster exhibit similar patterns of private sector involvement?
- Additional research on coordination will be required. Future scholarship should focus specifically on the interaction of the public and private sectors in emergency management.
- Methods of educating and involving businesses in emergency management must be promoted. Public officials and agencies should include, where possible, corporations in all types of disaster prevention and planning activities.
- Practitioners must continue to emphasize networking and partnering. The performance of emergency management is increasingly a result of the successful collaboration taking place among government agencies and corporations.
- The factors that hinder and foster coordination must be explored by academia. Practitioners should also familiarize themselves with the lessons provided by scholars in order to augment future emergency management capabilities.

In conclusion, it is apparent that the private sector plays important roles in emergency management and interacts frequently with government officials and agencies to perform important disaster functions. It is hoped that this paper will foster more discussion about the involvement of businesses in disasters and their coordination with the public sector. There has never been such a great need to overcome the problems associated with businesses in disasters while harnessing the potential and actual contributions of the private sector in emergency management. The authors therefore invite and encourage others to study these topics in order to add to the knowledge base of disasters, and improve our ability to prevent and respond to their adverse consequences.



### **Notes**

1. Project Impact is now known as the Pre-Disaster Mitigation Program. It is modeled after the Hazard Mitigation Program and is supported by the Section 103 of the Disaster Mitigation Act of 2000. The Pre-Disaster Mitigation Program was implemented in 2002 and will provide \$25 million in grants to local and state governments.
2. Other disaster-related roles of the private sector include loss prevention, site security, and legal services.
3. Unfortunately, many businesses still overlook the importance of occupational health and safety as they downplay the potential for accidents and disasters, and ignore prevention and preparedness activities in order to maintain a higher profit margin.
4. Terrorism preparedness is often conducted with public health agencies to build the Metropolitan Medical Response System.
5. For a variety of reasons, it is extremely difficult to determine the number or percentage of businesses that fail in the wake of disaster (Webb et. al., 2000, p. 86). However, it is generally believed that there will be at least some business mortality after a disaster based on the magnitude of the hazard, the steps taken for mitigation, the strength of the company, and the condition of the economy. It is estimated that nearly 2,000 small businesses went under in the months after the September 11th disaster (Shah, 2002).
6. There have been instances of dishonest business practices in the aftermath of disaster (e.g., price gouging, contractor fraud, etc.).

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