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Public/Private Collaboration in Disaster: Implications from the World Trade Center Terrorist Attacks

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ABSTRACT

The following paper discusses the important role of the private sector in emergency management and explores the interaction of businesses with government agencies during times of disaster. Utilizing the September 11 World Trade Center (WTC) disaster as a case study, it identifies the functions that were performed by businesses as well their coordination with government officials and agencies. Successes and challenges of coordination are identified. The paper concludes with lessons and implications for academics and practitioners interested in public/private relations in emergency management.

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INTRODUCTION

Research in emergency management indicates a shift in paradigms from a reactive approach to disaster resistant/resilient jurisdictions (Britton and Clark, 2002). Current disaster policies witness a trend of partnering between the public and private sectors. New initiatives such as the Federal Emergency Management Agency's "Project Impact"¹ 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). Unfortunately, research on the roles of the private sector is scarce. There is still insufficient information about the interaction of the local jurisdiction with all concerned organizations during disaster response (Waugh, 1988; Erickson, 1999). In particular, there is a lack of information about communication and cooperation between businesses and government agencies to solve mutual disaster problems (Webb et. al., 2000; Mileti, 1999).

With this in mind, the following paper discusses the important role of the private sector in emergency management and explores the interaction of businesses with government agencies during times of disaster. Utilizing the September 11 World Trade Center (WTC) disaster as a case study, it identifies the functions that were performed by businesses as well their coordination with government officials and agencies. Successes and challenges of coordination are identified. The paper concludes with lessons and implications for academics and practitioners interested in public/private relations in emergency management. Before proceeding, the methodology used for this study is first discussed.

METHODOLOGY

Information for this Quick Response Report has been obtained from a variety of sources and through various methods. First, comments in the section regarding the role of the private sector in emergency management are based on the combined 18 years of professional and scholarly experience of the authors. One of the authors was previously employed as a County Emergency Management Coordinator and as a Regional Fire Coordinator for the Forestry Service in the state of Texas. Consequently, this author has firsthand 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 functioning as a case worker for the Denver Branch of the Mile High Chapter of the American Red Cross. This author also arranges several internships each year with businesses for Emergency Administration and Planning students at the University of North Texas who are interested in pursuing careers in the private sector. The final author served as an intern working on Project Impact initiatives with Region IV of the Federal Emergency Management Agency 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. Each of these authors teaches courses in the Emergency Administration and Planning Program in the Department of Public Administration at the University of North Texas and has interest and specialization in emergency management, response operations, and disaster recovery areas. This background has enabled the authors to understand the functions performed by the private sector when disaster strikes.

Specific information on the private and public response to the World Trade Center terrorist attack was obtained through a Quick Response Grant from the Natural Hazards Research and Applications Information Center. Prior to activating this grant, the authors identified and contacted potential informants involved in the response to this disaster from the public and private sectors. The authors then traveled to the scene and spent a week interviewing numerous 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 for multiorganizational collaboration in the future. At the close of these interviews, "snowball sampling" was utilized to uncover additional informants, and they were subsequently contacted. Among others, informants included representatives of businesses that were affected, employees and volunteers of corporations that responded to the incident, and public officials from various departments (e.g. emergency management, public works, transportation, etc.). After conducting this field research, the authors obtained additional findings by attending emergency management conferences relating to the 9/11 disasters or through follow-up e-mail correspondence and phone conversations with interviewees. The authors also relied on internet articles, media coverage, and news clippings to support findings where needed.

ROLES OF THE PRIVATE SECTOR

Corporations play important and varied roles in emergency management. The private sector is involved in volunteer and donation activities, insurance provision, occupational health and safety, 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. Each of these areas will be discussed in turn.

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 process that occurs immediately after disasters. Employees often serve as volunteers during the response phase 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 (Vaugh, 1988, p. 119). In other cases, restaurants donate food to emergency workers and 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 to affected areas. In addition, home improvement stores, such as 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 (e.g., 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 role in mitigation by assigning a dollar value to risk, spreading the costs of disaster among a wide population, and reducing vulnerability through education, training, and the safe location of property. State Farm even has a showcase "Good Neighbor House" in Deerfield Beach, Florida, that is built with the latest disaster prevention materials and techniques (e.g. impact resistant glass, lightning protection, smoke detectors, fire sprinklers, high wind shutters, water damage detection, hurricane straps for the roof, etc.).

Occupational health and safety has been a growing concern of businesses since the industrial revolution. Effort has traditionally focused on the length of the employees' work day and periodic breaks in addition to the prevention of slips, trips, falls, back injuries, and industrial accidents involving machinery or heavy equipment. With increasing government regulations and fines for safety violations, manufacturing firms and related companies have become more interested in maintaining a safe work environment through employee education and training, clean and well-organized factories, safety checks, first aid stations, and access to emergency response equipment. Preventive and planning measures for hazardous materials fires, explosions, and spills have been a large focus of occupational health and safety, especially since the 1984 Union Carbide disaster in Bhopal, India. Industries with large quantities of lethal chemicals must file "Tier II" reports to notify first responders, emergency managers, and local emergency planning committees of the risk facing the community. Many businesses - for example, Texas Instruments and Raytheon - also have their own emergency teams that respond to industrial disasters before the arrival of (and in conjunction with) public emergency response teams. Industry is now giving attention to workplace security/violence and possible terrorist attacks on petroleum refineries and other plants with hazardous substances.

Transportation firms have always performed emergency management functions. 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). Railroad companies are now required by law to track the shipment of hazardous materials. They also have their own teams of employees that respond to derailments to ensure a quick recovery of normal operations. 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. 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, psychological counseling, etc.

There are numerous companies involved in emergency medical health care as it relates to disaster. Prior to an event, hospital administration and staff meet with community leaders to plan and prepare for disasters such as earthquakes, hazardous materials spills, and terrorist incidents that may involve large numbers of victims. When an emergency or disaster occurs, ambulance companies dispatch emergency medical technicians to establish triage procedures, 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 friends. 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. Fires such as the one that occurred at the MGM in Las Vegas in 1980 have impelled 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 sometimes 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. the coast) and because the size and occupancy of many hotels has 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 disaster to obtain interviews as well as audio and/or video footage. Once this information is compiled, organized and edited, it is then 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. But the media are also 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 alarming number of businesses that fold after disaster (ranging from as low as 5% to as high as 40% depending on the nature of the catastrophe), corporations are becoming increasingly involved in mitigation, preparedness, response, and recovery activities. For instance, one beer distributor in California spent an impressive amount of money to shore up equipment to prevent it from tipping over if an earthquake were to occur. 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 includes the identification of vital operations, 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 large and rising toll of disasters and is expected to embrace these efforts even more in the future. However, many smaller businesses do not participate in these endeavors as 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 provide consultation to governments on ways to incorporate mitigation into major development, infrastructure, and transportation projects. Private companies also map 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. ENPRO, a distributing company, sells and installs window film products to make glass more resistant to wind, terrorist incidents, and other hazards. The Institute of Home and Business Safety helps families and corporations prevent accidents and prepare for disasters. SAIC works with governments and businesses to assess risk 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 Hultcher Services are companies that respond to hazardous materials spills on road and railways respectively. DRC, Inc. provides logistical support during response by providing labor, workforce housing, portable water, etc. Phillips and Jordan is a company that contracts with government agencies to remove, burn, and dispose of debris and animal carcasses in the aftermath of disaster. Vorizon, ConEd, and other utility providers restore phone, electric, gas, and water infrastructure that has been rendered inoperable due to the powerful forces of nature. 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 to estimate costs of repairs. Numerous contractors and builders descend on disaster-affected communities in order to make repairs to damaged buildings or rebuild entire communities. Thus, clearly the private sector plays numerous and important roles in emergency management.

PRIVATE SECTOR FUNCTIONS IN THE 9/11 DISASTER

The World Trade Center terrorist disaster required significant involvement of the private sector. It also necessitated

close coordination with officials and agencies in the public sector. Functions included warning and evacuation, emergency operations center (EOC) relocation and management, emergency operations at ground zero, mitigation of potential terrorist attacks in the future, perimeter control and law enforcement, security and medical staffing, logistical support of USAR teams, information dissemination, communication and infrastructure repair, building restoration, sanitation services, business relocation and resumption, disaster assistance and insurance coverage, mass fatality management, debris removal, transportation, 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 the North Tower of the World Trade Center, there was concern that a similar event could recur at the South Tower. For this reason, occupants of the South Tower were admonished to leave the building while others left voluntarily. However, it is believed that someone at the South Tower got on the intercom and stated that evacuation was not necessary. Therefore, many people remained in the building or returned to work. When the South Tower collapsed at 10:05 am, 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 the North Tower. 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 leaving the buildings, were killed by fire and the subsequent collapse. At least 2,830 people lost their lives, including 403 emergency workers. Nonetheless, the design and construction of the buildings, in addition to the adequacy of well-lit stairways and prior evacuation training exercises involving businesses in the WTC complex, allowed thousands of workers to exit the buildings safely.

EOC Relocation and Management

The public and private sectors also interacted closely in the EOC. When the airplanes crashed into the towers at the WTC, the city emergency management staff decided to evacuate the EOC (which was located in WTC building 7). This proved to be a wise decision in that the collapse of the North Tower damaged WTC 7 and resulted in the building being gutted by fire. The city subsequently obtained office space at Pier 92 on the Hudson River. Manufacturers donated necessary electronic office equipment (including computers, printers, and fax machines), and utility companies were approached to establish sufficient phone lines for the new EOC. Once the EOC was operational, volunteers from the private sector arrived to help in any way they could. Public officials and representatives from various corporations (including those from the WTC) 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 with the successful improvisation and management of the response.

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 GIS database was established and 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. 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 GIS. The data entry required much input from the private sector. In addition, E-TEAM software was utilized to provide situation updates on the assignment of resources (e.g., staging areas, food, ice, water, restrooms, etc.). Because over 200 organizations were involved in the response, this required frequent updates on the resources being deployed by the private sector.

Mitigation of Potential Future Attacks

Almost immediately after the terrorist attacks occurred, federal, state, and local officials felt 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 speed up 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 9/11 disasters. This was not only the case with bollards at government buildings; it occurred with airport and airline security as well. Private companies were asked to increase the rigor of passenger screening, and airlines were asked to comply with more stringent safety regulations. The private sector therefore played a major role in security and collaborated closely with the government to implement new policies after 9/11.

Perimeter Control and Law Enforcement

One of the major challenges after the collapse of the WTC buildings was to control access to the affected area. In the immediate aftermath of the disaster, police escorted business owners into the affected area to allow 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 felt 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 often 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 also 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 the recovery) had valid reasons for getting into the restricted area. Therefore, exceptions had to be made so that the response and recovery operations could proceed. Moreover, 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 both potential and actual looting, disaster assistance fraud, and other criminal behavior. The collapse of the WTC towers and other nearby buildings resulted in a situation in which classified documents, precious metals, and even weapons were at risk of being taken by those working at ground zero. In addition, the stores in the malls under the trade center could not be secured due to damaged doors and shattered windows. For this reason, a number of 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 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 WTC 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 (GPS) 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 disaster assistance.

Security and Medical Staffing

Finding an adequate number of personnel to maintain certain critical functions was a significant challenge in the 9/11 disaster. Site security and medical care were two functions that required adequate numbers of personnel. After the incident occurred, police worked 12-hour shifts or longer each day to control access to the disaster-affected area. Their goals were to keep curious citizens away from dangerous debris and to 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 also brought to New York

City to augment the New York 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 officers. All of this kept police from performing other daily and more routine functions. 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 required assistance 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 the patients who needed care. 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 in those areas 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 WTC collapsed and very few were found alive.

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 World Trade Center 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, which were simply rescheduled or canceled in the weeks immediately following September 11. 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 Starbuck's 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 9/11 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 restriction zones were for any given day, how to find out about lost loved ones, and where to go for disaster assistance. Coordination between the public and private sector was critical, and the media proved to be a valuable asset for this purpose. Reporters from the print, radio, television, and cable media met with public officials frequently and at various locations in order to obtain updates on the situation. Emergency management officials felt 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 information, and many other issues. Many of these companies provided this type of 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 information lines available prior to the incident, while others used lines previously assigned for other roles to assist employees and their

families. Most of the private sector businesses surveyed handled this function on their own.

Because the 9/11 disaster was an act of terrorism, site security was an issue and a wide security perimeter was set up. In addition, the air was filled with particulate matter that hindered breathing. These factors led to the shutting down of housing near the WTC. According to apartment dwellers 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 WTC 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 WTC also lost hundreds - if not thousands - of hard lines (perhaps a number of switches equal to all those utilized by the City 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 the inability to accept this form of payment was critical to their operation. 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 with government leaders.

Getting the infrastructure restored was a massive and critical function after the 9/11 disaster. The restoration of water, electric, and gas service required the involvement 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 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 a quick and effective manner.

Building Restoration

The fires in the towers, and the collapse of these and other buildings, not only affected the World Trade Center. Instead, the resulting debris and dust cloud impacted a large number of buildings in the Lower Manhattan area. For instance, ash was several inches deep inside those buildings close to the WTC. Even the buildings located blocks away from ground zero had dust particles in their elevator shafts or heating, ventilation, and air conditioning (HVAC) 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 the 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 pre-contracts with BMS Catastrophe. However, other work was initiated by BMS Catastrophe as knowledge about their services spread by word of mouth to tenants or building owners. While most of BMS Catastrophe's involvement was directed toward the private sector, they did interact and coordinate with government agencies and officials. BMS Catastrophe obtained approval from the Federal Aviation Administration to fly a private jet to New York on September 12 after the President decided to ground all aircraft. Before BMS Catastrophe could work, it needed to obtain 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 work. In addition, the company worked closely with the Department of Sanitation. Because electricity was lost for a

vast number of buildings in Lower Manhattan, food was beginning to spoil 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 check points 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 sector proved to be invaluable for facility restoration.

Sanitation Services

Because of the massive influx of emergency responders and others into the lower Manhattan area, there was a large need for portable sanitation units. The mayor's Office of Emergency Management, American Red Cross, Con Ed, FEMA, and others contracted with the Mr. John company 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 the public officials to arrange the terms of the contracts, the New York Sheriff's office coordinated with the company to escort the sanitation units in from New Jersey. The company also worked with government agencies to identify locations that needed the units and obtain vehicle permits that would allow the company into the disaster area. One major problem that arose was the dynamic and fluid nature of the road closures. In many cases, Mr. John would attempt to drop off a sanitation unit only to find out that access into the area was not approved. This created periods of waiting until the proper permits could be obtained. In other cases, no one at ground zero knew where the units were to be placed. Regardless, representatives of Mr. John felt 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 9/11 disasters. Issues for corporations included the inability to operate, employee relations, expense concerns, city ordinance enforcement, facility relocation, and record retrieval. Because many facilities 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. In other cases, businesses needed to have employees or staff work overtime to clean the facility. This was also problematic in that the corporation had little or no revenue coming in to pay for these expenses.

Another important issue following the events of 9/11 pertained to the enforcement of 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. It appears that none of the businesses interviewed indicated that they had been consulted concerning 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 methodology for determining when they should be enforced.

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 trade center 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 9/11 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 businessperson 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 cases, 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. The Lower Manhattan Development Corporation was created to assist in redeveloping the downtown area. Several informants said they were sure that the leaders and partners of the 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 other private sector businesses.

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 facilities around the nation. In these cases, only the work in progress was lost when the WTC towers collapsed. Other companies were not so fortunate. They either did not have backups of their information, or the backup locations were located in nearby WTC 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

Disaster assistance involved the private sector after the 9/11 disaster. As an example, the airlines affected by the hijackings provided disaster assistance to the families of deceased passengers. This included the provision of information, psychological counseling, and other forms of aid. Most of the disaster assistance came from the Federal Emergency Management Agency and other government departments, however, and was directed to citizens or the private sector. Many businesses were in need of financial help after the terrorist attacks, and much of this help came from the government. Congress approved an aid package involving millions of dollars of grants for the airlines affected by the 9/11 incidents. The Small Business Administration also provided low interest loans for those corporations that required additional money to operate after the disaster. While some of this assistance was closely coordinated, other aid was not. Some businesses affected by the 9/11 disaster noted that they received flyers from congressional representatives that announced a meeting would be held at a nearby university and would outline the requirements of disaster assistance programs. However, some of the businesses interviewed did not hear from or about any government assistance programs; they subsequently did not know where to turn for help.

Insurance companies also played a major role after the WTC disaster. Companies sent scores of adjusters into the affected areas to deal with the huge numbers of claims. One 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. In most instances, insurance adjusters completed their job without interacting with officials from the public sector. However, insurance companies did have to be granted access to the disaster scene after damaged buildings were inspected by engineers. The government also sought insurance for those working at ground zero. 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. Therefore, the contractors involved in ground zero were allowed to begin operations before the normally required insurance policies were in place.

Mass Fatality Management

The WTC disaster was, without a doubt, 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 hundreds 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 nature of the disaster and intense heat from the burning jet fuel. Consequently, the confirmed number of dead is low and is still being revised to this day. The private sector has been a valuable asset for the government in this identification process nonetheless. For example, public officials communicated with the airlines involved in the terrorist attack, businesses in the WTC, and local hospitals to develop lists of the missing and presumed dead. Private corporations also participated in fatality management. While most of these activities involved collaboration across sectors, there were some notable exceptions. Newspapers reported dramatically different numbers of deaths than the government (in comparison to their competitors and over time). In addition, fire department personnel confronted police when private contractors were allowed to bring in heavy equipment to speed up the debris removal process.

Debris Removal

As already mentioned, the twin towers were not the only buildings destroyed in this disaster. As the North and South Towers 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 thousands of tons of debris. With this enormous amount of rubble before them, government officials designated the city's Design and Construction Department as the lead agency for debris removal. This agency then divided the 13-17 acre WTC 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. Although this was 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.

Transportation

All forms of transportation in the Manhattan area were affected by the terrorist events. The airline industry was 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 the grieving process. Transportation in and around Manhattan was also impacted by the response operations. Initially, the city government closed the downtown area south of 14th Street. Roads adjacent to the World Trade Center were also closed 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. In addition, large buses were used to move USAR teams from the Jacob Javitts Center to ground zero and back. The private sector provided transportation during the response and collaborated with the public sector to accomplish related functions.

Donations Management

Donations management is a constant concern for 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. This was certainly the case with the 9/11 disasters as an unbelievable outpouring of relief arrived in New York City. Many of the donations were provided by the private sector. 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 their personnel at the USAR staging area. Likewise, the personnel at ground zero donned overalls and other protective equipment provided by manufacturers. Respirators and the cartridges used in the masks were given to responders to alleviate breathing problems created by fire, smoke, and unknown particulate matter. Gloves, batteries, and other supplies were also sent by private companies. In many cases, the donations were closely coordinated with officials in the public sector.

There were instances in which unneeded supplies were given however. For instance, VMAT 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 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 9/11 victims in order to have sufficient reserves for future disasters. This resulted in an outcry from the public and a congressional review of use of donations by this nonprofit 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 World Trade Center Disaster resulted in a massive loss of equipment possessed by the Fire Department of New York (FDNY). It is estimated that the emergency vehicles destroyed included at least: 10 ambulances, 2 EMS Suburbans, 24 sedans used by staff chiefs, 17 Suburbans used by batallion chiefs, 2 heavy rescue units, 1 tactical support rescue unit, 2 high-rise units, 4 haz mat vans, 1 SCBA unit, 2 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. It was Seagrave that received a \$25 million contract to build 54 units for the FDNY. It therefore requested the support of the local labor union, mayor, and citizens of Clintonville, Wisconsin, to speed up the production process. The company communicated with the FDNY to receive the finished vehicles and continues to produce those that remain to be built. The 9/11 disaster therefore indicates that the private sector is a major supplier of emergency equipment to the public sector.

DISCUSSION

This review of the private sector in the 9/11 disaster points out several important lessons and implications for researchers and practitioners alike. While these findings should be regarded as preliminary, they may have significant impact upon the future of emergency management theory and its application.

1. It 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.
2. 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 disappearing, blurring, or even artificial.
3. 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.
4. Coordination issues surrounding site security proved to be the largest challenge during the response to the 9/11 disaster. Check-in procedures for contractors should be streamlined (especially at terrorist incidents that require site security).
5. Numerous factors facilitate coordination among the private and public sectors. Planning meetings, communications capability, and cooperation were mentioned as variables that promoted close collaboration.
6. Much more needs to be known about the roles of businesses in disasters. For example, are there functions performed by corporations beyond additional those outlined in this paper?
7. Additional research on coordination will be required. Scholarship in the future should focus on the interaction of the public and private sectors in emergency management.
8. 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.
9. Practitioners must continue to emphasize networking and partnering. The performance of emergency management is increasingly a result of successful collaboration among government agencies and corporations.
10. The factors that hinder and help coordination must be explored by academia. Practitioners should familiarize themselves with the lessons provided by scholars in order to augment future emergency management capabilities.

In conclusion, it is hoped that this paper will foster more discussion about the private sector in disasters and its involvement with the government in emergency management. The authors 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.

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FOOTNOTE

¹ The status and name of Project Impact is currently being reviewed at this time due to the recent Disaster Mitigation Act.

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