



FIVE YEARS LATER:

Emergency Preparedness Improvements
in New Orleans, Louisiana since

Hurricane Katrina presented by evacuteer.org + the UNO/LSU

Gulf Coast Center for Evacuation and Transportation Resiliency

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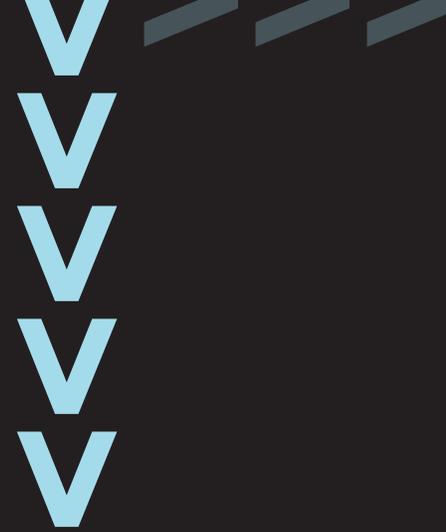
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Robert X. Fogarty
Evacuteer.org Director

> FOREWARD

When I first moved to New Orleans in 2007, local newspapers and television stations led front page stories and evening newscasts with Hurricane Katrina recovery stories.

Today I gauge the passage of time by the amount of stories in the newspaper that contain the word “Katrina.” There are coffee and paper mornings where the K-word can’t be found. When year two turned to year three, our public figures and friendly tableside rhetoric shifted slightly: “Now three years later...” And as the months progress, they said, “Now three and a half-years later...” Today, it is “Now five years later...”

That moment, the day the New Orleans calendar reset, guides people here. As the director of the emergency preparedness non-profit evacuteer.org, I am intimately involved in planning for future storms, specifically how to safely evacuate nearly 30,000 residents lacking reliable evacuation transportation. Over the past five years, we have seen major improvements in disaster preparedness from federal, state and local governments, as well as from non-profit, academic,

faith and community-based organizations. Improvements we want to recognize and celebrate here. At the same time, it is a critical time to recognize work that still needs to be done.

Vigilantly preparing for future storms must be a requirement for living in New Orleans. New Orleans has spent billions of dollars to rebuild. As Colonel Terry Ebbert, former director of the New Orleans Office of Homeland Security, says, the city’s ability to manage storms demonstrates whether or not we are viable economically and culturally.

This paper identifies hurricane emergency preparedness programs, policies, legislation and organizations that have either been created as a result of Hurricane Katrina or have significantly improved as a result of the storm. All of them merit recognition, because all of them work towards ensuring that people who have lived and loved here, laughed and played here will always have New Orleans.

Our future depends on responsible preparedness from each and every member of the community, to ensure that what happened five years ago never happens again.

Robert X. Fogarty. January 2011.

>> DISCLOSURES

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Evacuteer.org is a 501c3 non-profit organization directly involved the City of New Orleans' Office of Homeland Security and Emergency Preparedness. We deliver this project in conjunction with the Louisiana State University/ University of New Orleans Gulf Coast Research Center for Evacuation and Transportation Resiliency. Evacuteer.org has trained 26 partner groups and nearly 700 volunteers to assist in an activation of the City Assisted Evacuation Plan (CAEP). The Center for Evacuation and Transportation Resiliency has published extensive and nationally recognized peer-reviewed work about transportation resiliency as a key component to effective emergency preparedness. In presenting this project, we note that access to interview subjects and source documents was met with little hesitation, due to existing relationships with community leaders and public officials. We offer these disclosures regarding potential organization biases, but we feel that we have maintained a level of professionalism and objectivity while identifying, researching and writing about these improvements in emergency preparedness.

This paper would not have been possible without generous guidance and support from Prof. John Renne and Prof. James Amdal of UNO and Prof. Vinayak Dixit and Prof. Brian Wolshon of LSU.



>> INTRODUCTION





On August 29, 2005, Hurricane Katrina, the third strongest hurricane ever to make landfall, and the most destructive natural disaster in the history of the United States, devastated New Orleans and the United States Gulf Coast. Over 1,800 people died, 1,577 of those from the state of Louisiana. The United States government spent billions of dollars across the Gulf Coast to repair and reconstruct the region (Bevin et al., 2008).

Despite predictions from local media outlets and emergency management researchers well before Hurricane Katrina that identified catastrophic consequences in the event of New Orleans' levee failures, the federal, state and local governments were unprepared. "Hurricane Katrina revealed weaknesses in the basic elements of preparing for, responding to, and recovering from any catastrophic disaster" (GAO, 2008).

In 2008, Hurricane Gustav tested improvements

made post-Katrina. The storm triggered a mandatory evacuation and the evacuation of nearly two million residents of southern Louisiana (Anderson, 2008). Emergency managers, local politicians, first responders, and community leaders alike were given an opportunity to demonstrate how effectively they could work together to prepare the city for another major hurricane. Though Gustav did not cause any major damage to the city of New Orleans, it illustrated vast improvements made in emergency preparedness just three years after the costliest natural disaster in the history of the United States.

Today, five years after

Hurricane Katrina, New Orleanians and other stakeholders have made improvements to emergency preparedness and disaster management systems. It has been a collaborative effort among the local, state, and federal governments as well as private enterprises and academic, community and nonprofit organizations. The struggles residents of New Orleans face in recognizing the fragile natural environment in which they live have facilitated a stream of improvements and goodwill intended to prevent the aftermath of Hurricane Katrina from ever reoccurring.



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1929

bleepin' fast

>> PURPOSE

Hurricanes Katrina and Gustav helped us to identify gaps in disaster planning. By examining changes made to emergency preparedness and disaster response and management post-Katrina, we seek to identify the most effective improvements made at individual, community, and governmental levels. In so doing, we pose the following questions: How did each institution or agency react to Hurricane Katrina? How did it respond during Hurricane Gustav? What changes has it made since Katrina to become better prepared for future natural disasters? Disasters, of course, are not unique to the city of New Orleans. We must recognize how improvements and innovations made here can be applied to other communities. Additionally,

then, we examine the degree to which strategies employed by New Orleans' organizations and individuals can be transferred to other American cities.

In New Orleans, common sentiment among emergency preparedness officials is that the city stands better prepared for disaster as a result of lessons learned from Hurricane Katrina. Ultimately, our research goal is to assess the truth in this statement.

CITY ASSISTED EVACUATION PICK-UP

POINT #6

Only one small carry-on bag per person (30" total size)



Bring all medications & prescriptions.
Bring all important papers and contact information.
Bring official identification if you have it.

ABSOLUTELY NO:

Alcohol
Guns, knives or other weapons
Illegal drugs or prohibited substances

IF TRAVELING WITH PETS

Must be in a carrier or restrained on a leash.
Must have a collar and ID tag.
Must have current vaccinations & have needed medications.

If you need assistance call 1-800-295-6431,
1-800-961-NOLA (777), or 311.

**NO STOPPING
TO
CORNER
←→
ANYTIME**





METHODS

In conducting our research, we identify an extensive list of the improvements made to emergency preparedness in post-Katrina New Orleans. Our strategy for compiling this list of improvements was a multi-faceted approach that utilized both primary and secondary sources. We surveyed professionals in all areas of our research, searched for information using electronic databases at Tulane University, and utilized public records for additional data. Based on our findings, we were able to eventually narrow down the list of improvements to 13 components. These 13 components are what we have identified as best practices in emergency preparedness and disaster response.

In order to qualify each improvement as a best practice, we compared what took place during Hurricane Katrina with present day practices. In making a comparison between the two time frames, we also examined the measures taken to see that these improvements were made. Thus the areas that showed that greatest improvement with the most benefits for the city are what we

consider to be the best practices. In some instances, the entity was nonexistent during Hurricane Katrina, and so its performance in 2005 cannot be evaluated. Instead, we analyzed how detrimental its absence was during Katrina, how those effects prompted its establishment after the storm, and how it functions today in the event of another natural disaster.

The data we obtained to support our assertions is both quantitative and qualitative. For some components, a large number of study participants was available. We used the results of surveys to examine the efficacy of the emergency preparedness strategy. For other improvements in which it was not feasible to acquire a sufficient-sized sample population without bias, we rely in part on qualitative data, obtained through in-depth subject interviews with over 20 leaders in emergency management, community-based organizations, city government, academia, and private enterprise.

For each of these improvements, we will address

in more detail our methodology for identifying and surveying or interviewing study participants. recent years to become more prepared for another natural disaster?

In addition to addressing these questions, we would also like to examine how transferrable the strategies employed by these organizations and individuals are to other American cities. Disasters are not unique to the city of New Orleans, and so it is important to recognize how these improvements and innovations can be applied to other communities. A common sentiment among emergency preparedness officials is that the city is much more prepared for a disaster as a result of the lessons learned from Hurricane Katrina. What we ultimately seek to address in our research is whether or not these feelings carry merit.

>> The Improvements

- 1. The City Assisted Evacuation Plan**
- 2. The Broadmoor Improvement Association: Community Emergency Response Team**
- 3. P25 Interoperable Communications System**
- 4. New Orleans Hotel and Lodging Visitor Evacuation Plan**
- 5. The City of New Orleans Emergency Operations Center**
- 6. National Emergency Child Locator Center**
- 7. Tulane University's School of Public Health's Disaster Management Program**
- 8. University of New Orleans Center for Hazard Assessment Response and Technology (CHART) program**
- 9. Inner Harbor Navigation Canal Surge Barrier (IHNC) and the closure of the Mississippi Gulf River Outlet**
- 10. Creation of FEMA administrator**
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- 12. UNO/LSU Gulf Coast Center for Evacuation Transportation and Resiliency**
- 13. Evacuteer.org**



New Orleans Evacuation Pick Up Point: Palmer Park, Public Art Rendering.

1. The City Assisted Evacuation Plan

Hurricane Katrina displayed an immense lack of planning for those considered “carless” or without reliable access to personal evacuation transportation in a disaster situation. An estimated one million people fled the approaching storm from the New Orleans metropolitan area via car (Varney, 2006). However, those without a vehicle, or without resources such as money for gas and

lodging, were left behind with no alternative means to evacuate. In a survey done by the Kaiser Foundation, the Washington Post and Harvard University just weeks after the storm, researchers found not having a car was the most selected reason for not evacuating when the Mayor of the City of New Orleans, Ray Nagin, declared an emergency evacuation on August 28, 2005 (Kaiser Foundation, 2005). Then Mayor Nagin, announced that the Louisiana Superdome, home to the National Football League’s New Orleans Saints, would open as a “shelter of last resort.” As multiple levees breached at the 17th Street, London Avenue, and Industrial Canals, water poured into the streets of New Orleans. Without transportation to evacuate, many living in heavily flooded areas crawled to their roofs and waited in desperation for rescue. Others drowned in the floodwaters.

Emergency teams rescued over 60,000 people along the Gulf Coast from rooftops and flooded homes, according to the United States Coast Guard. Of those left behind, the majority

were low income, minority, children, elderly, and disabled (Renne, et al, 2008). Because transportation and emergency managers had not planned a multi-modal evacuation approach, meaning that there would be more than one transportation method, large portions of the population were left out who could not find their own modes of transportation. Nearly 25,000 people remained stranded at the Superdome or the Ernest N. Morial Convention Center in days after the storm (Dwyer & Drew, 2006).

In 2006, Congress requested the U.S. Department of Transportation (DOT), in cooperation with the U.S. Department of Homeland Security (DHS), “review and assess federal and state evacuation plans for catastrophic hurricanes and other catastrophic events impacting the Gulf Coast region and report its findings and recommendations to Congress (DOT, 2006).” These governmental organizations assessed various modes of transportation, coordination between states, methods of communicating evacuation plans to citizens, availability of food, water, and shelters,

and physical and mental impact on those involved in the evacuation. In the years to follow, FEMA provided regional evacuation planning support to the Gulf Coast region and assisted in the establishment of multi-modal transportation contracts such for air, rail and bus to support evacuations (Committee on Homeland Security, 2009).

Recommendations from the study included:

- Developing regional plans for mass evacuations the size of Hurricane Katrina
- Conducting regional exercises for multimodal forms of evacuation transportation
- Reviewing national planning guidance related to evacuations the magnitude of

Hurricane Katrina

- Involve transportation agencies directly in the development of evacuation plans
- Integrate sheltering and evacuation planning for all segments of the population

In response to these recommendations, the New Orleans Office of Homeland Security and Emergency Preparedness (NOHSEP) developed, wrote, and coordinated the execution of the City Assisted Evacuation Plan (CAEP). The CAEP services citizens who need to evacuate during an emergency, but who lack the capability to self-evacuate. It is an evacuation method of last resort, and only for those citizens who have no other



means to leave, or have physical limitations that prohibit self-evacuation (NOHSEP, 2009). Upon the declaration of a mandatory evacuation by the Mayor of the City of New Orleans, emergency managers activate the CAEP. Under the operations plan, the CAEP has approximately 42 hours to collect residents at 17 neighborhood pick-up points throughout the city of New Orleans. Four of these pick-up points are specifically equipped to handle senior citizens and the disabled. Buses begin to pick people up at neighborhood pick up points 54 hours before tropical storm force winds hit Louisiana coastline (H-hour) and can continue until 12 hours prior to landfall. At H-hour 12, all public safety agencies must begin hunkering down their operations in advance of the upcoming storm. The CAEP provides evacuees with a round trip ticket to and from a state or regional shelter out of harm's way during the storm.

Emergency managers implemented the CAEP for the first time on Saturday, August 30, 2008, in advance of Hurricane Gustav. The CAEP evacuated over 20,000 citizens, more

than 300 pets and over 14,000 visitors from New Orleans in less than 35 hours (2009). Residents reported to the 17 pick-up points, and New Orleans Emergency Medical Services (NOEMS), in association with the Regional Transit Authority, provided door-to-door service with paratransit buses for residents who identified themselves as physically unable to get to a pick-up point.

Our research shows that the successful implementation of the CAEP resulted from mechanisms coordinating and deploying the assets of various local, state, and federal agencies and

organizations. The CAEP is compliant with National Incident Management System (NIMS) and uses Incident Command Structure (ICS) structure, currently the national approach to disaster management. NIMS provides a systematic, proactive approach to guide departments and agencies at all levels of government, nongovernmental organizations, and the private sector, to work seamlessly to prevent, protect against, respond to, recover from, and mitigate effects of disasters, regardless of cause, size, location, or complexity. Its ultimate goal is to reduce loss of life and property, as well as harm to the natural environment.



ICS is a standardized, on-scene, all-hazards incident management approach with built in flexibility, which can be used for incidents of any type, scope, and complexity (FEMA, 2010).

As a large, multi-component operation, the CAEP requires local, state, and nongovernmental agencies involved to have multiple operational plans. Upon initiation of the CAEP, the Mayor of New Orleans notifies all partner governmental and nongovernmental entities of a mandatory evacuation and each is responsible for executing their roles within the plan. The City of New Orleans establishes evacuee processing and staging centers at local hotels, the Morial Convention Center (MCC), and the Union Passenger Terminal (UPT). The Louisiana Governor's Office of Homeland Security and Emergency Preparedness, in affiliation with other state departments, including the Department of Transportation and Development (DOTD), the Department of Children and Family Services (DCFS), the Department of Health and Hospitals (DHH), and the Louisiana State Police (LSP),

activate their plans to transport and shelter evacuees. All state agencies are expected to report and make notifications to the appropriate federal agencies, such as the Federal Emergency Management Agency (FEMA), Department of Homeland Security (DHS), Department of Transportation (DOT), and the Department of Defense (DOD) (CAEP, 2008).

In April of 2009, the University of New Orleans (UNO) CHART program surveyed 364 people who utilized the CAEP during Hurricane Gustav to gauge the participants' satisfaction with the CAEP. Results showed that citizens generally regard the CAEP as a successful strategy. Nearly three-quarters of evacuees reported satisfaction with their experience, and would use the CAEP again. Almost 70 percent of participants rated their re-entry experience as "good" or better and over half of the participants also rated transportation out of the city as "good" or better. Study findings showed evacuees were generally willing to listen to government officials, cooperate with them and contribute to the





effectiveness of evacuation efforts. A majority of these evacuees indicated that evacuation preparedness had improved considerably since Hurricane Katrina. While there is work to do to improve the CAEP, Hurricane Gustav's evacuation and resulting research concluded that compared to Hurricane Katrina, the CAEP allowed a much more orderly, pre-emptive evacuation of New Orleans' residents without reliable transportation.





2. The Broadmoor Improvement Association: Community Emergency Response Team

In the 1970s, the City Planning Commission recognized 72 official neighborhoods within the City of New Orleans. Almost four decades later, nearly 270 neighborhood organizations and associations have sprouted, with many neighborhood associations growing in strength, influence and structure in the last five years since Hurricane Katrina. The Broadmoor Improvement Association (BIA) and its complimentary organization, the Broadmoor Development

Corporation (BDC), arguably single-handedly saved their neighborhood immediately after Hurricane Katrina. Neighborhood leaders also began preparing for future storms with a committee dedicated to emergency preparedness. The BIA exemplifies how neighborhood associations have the ability to come together and form a effective and efficient hurricane evacuation plan for their communities.

As one of New Orleans most historic and diverse neighborhoods, Broadmoor covers roughly 358 acres (.56 square miles) of land situated near the center of the city with its boundaries, according to the City Planning Commission, as Eve Street to the north, Washington Avenue and Toledano Street to the east, South Claiborne Avenue to the south, and Jefferson Avenue, South Rocheblave Street, Nashville Avenue, and Octavia Street to the west. The 2000 US Census stated that it encompassed approximately 7,200 residents, 68 percent African American and 26 percent white. Household income averaged \$36,400, slightly lower than average household income of the city at large (\$43,200).

After Hurricane Katrina, Broadmoor appeared on a controversial list of possible areas slated to become green space, according to the Bring New Orleans Back Commission (BNOB), a commission Mayor Ray Nagin created to plan the city rebuilding process. 100 percent of the housing units in Broadmoor sustained “major or severe damage” during Katrina (Scott, 2008). Broadmoor leaders LaToya Cantrell, Hal Roark, Maggie Carroll and Duffy Voight each played integral roles in ensuring that the Broadmoor neighborhood recovered and that its residents live prepared for future storms since returning to the city. According to a 2008 case study produced by the John F. Kennedy School of Government at Harvard University, the BIA divided its redevelopment planning into five sub-committees: education, economic development, urban planning, transportation and emergency preparedness.

Duffy Voight, the chair of the original emergency preparedness subcommittee prior to Katrina, said suggestions made at post-Katrina BIA meetings became the responsibility of those

who voiced them. At one of these meetings in early 2006, Voight stood up and declared the neighborhood needed to prepare for future storms. With the assistance of graduate students from Harvard, the BIA researched the best practices in community preparedness around the country. Their research identified FEMA’s Community Emergency Response Team (CERT) as the best option for the Broodmoor neighborhood. This program would be able to train interested neighborhood citizens in a program that “educates people about disaster preparedness for hazards that may impact their

area, and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations (CERT, 2010).”

By the summer of 2008, BIA identified 143 neighborhood residents who might need evacuation assistance according to the neighborhood survey (Wile, 2008). As Hurricane Gustav approached New Orleans in August 2008, Mayor Nagin called for mandatory evacuation of the city. In turn, BIA members contacted each of the 143 residents on the list (Wile, 2008).

BIA members contacted

residents by phone starting on Wednesday (8/27/08) afternoon through Sunday morning (8/31/08). The statistics are as follows:



50% (71/143)	Personally contacted or left messages.
31% (44/143)	Unable to be reached due to having no phone number listed or having a wrong phone number listed.
19% (28/143)	Unable to be reached due to no answer and no message machine or a busy line.
52% (37/71)	Able to be reached by phone disclosed that they had an evacuation plan in place.
3 residents	Initially disclosed on Sat. 8/30 that they did not plan to evacuate. These residents were called at 8am on Sunday morning and by then had made plans to evacuate.



transportation found evacuation transportation with family/friends.

- One resident decided to try and evacuate his family in his car (which he did not plan to use originally because he feared it would break down). He made this decision after failing to get through to 311, the city's non-emergency hotline, to request special medical assistance for his wife, who was recovering from intensive surgery.

- Four families evacuated using the City Assisted Evacuation Plan
 - o Of the residents using the CAEP all four reported trying to call 311 and not being able to get through. 1 resident pre-registered with 311 due to 24-hour Oxygen needs. 311 told her they had no record of her, or of her husband.

- o BIA staff members provided rides to CAEP pick-up locations for two of the four families using the CAEP.

In addition to the 143 residents in the neighborhood who had said that they may need

evacuation assistance, 32 members of the local Episcopal Church also evacuated with this group. Led by Hal Roark, the executive director of the BDC, Reverend Jerry Kramer, the Episcopal priest of Free Church of the Annunciation, and Duane Nettles; the group evacuated to St. Timothy's Episcopal Church in Chattanooga, TN. According to Maggie Carroll of the BIA, the evacuees ranged in age from three to 84 years old, included single parents, couples and senior citizens, with varying income levels. St. Timothy's provided food, bedding, space and other necessities.

The Mayor of Chattanooga provided free passes to the zoo and aquarium, furthering the ease and comfort of the evacuation.

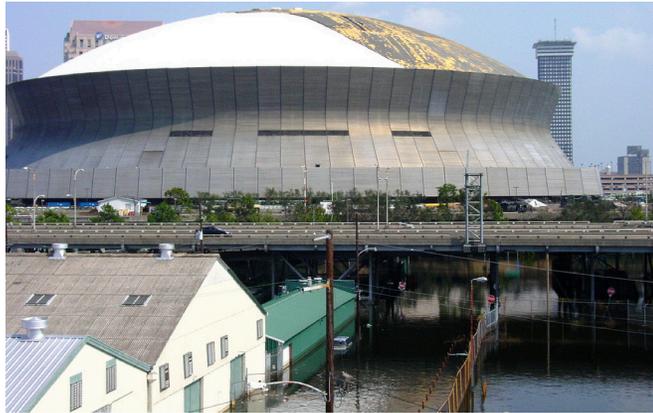
Broadmoor leaders indicated they learned many lessons from the Chattanooga evacuation experience. Both Roark and Kramer recognized that they do not have the capacity to take major evacuation responsibilities, such as physically evacuating the neighborhood, and that government assistance was required. Financial, emotional and physical complications appeared during the evacuation, and as the leaders of the organization, Roark



and Kramer felt responsible for the entire group. Roark called the experience “humbling” because the group evacuation outpaced the capacity of the BIA and Free Church of the Annunciation. “The people who participated experienced intense anxiety and had many needs. They began to experience nightmares,” Carroll said.

Today, the BIA no longer offers a ride out of town with fellow neighbors, but calls on neighbors to self select whether they need a ride to the CAEP’s pick up point in Broadmoor at Eleanor McMMain High School. Additionally, they developed the “Ride Share” program. The Emergency Preparedness Committee of the BIA enlists neighbors with evacuation means as drivers to pick-up residents needing a ride to the CAEP pick-up points. The emergency preparedness subcommittee is now called the Broadmoor Community Emergency Response Team and has nearly 20 members of the neighborhood CERT trained. BIA still maintains a list of residents who have identified that they need evacuation assistance.

Both Carroll and Voight believe Broadmoor is systemically, institutionally and organizationally more prepared than before Hurricane Katrina. The BIA pays a monthly fee to have a toll-free check-in number, where all neighborhood residents report themselves as “safe and sound” during an evacuation. They have a community forum on their website to post updates and whereabouts of neighbors extremely beneficial avenues for information collection and sharing for future evacuations.



3. P25 700/800 MHz Interoperable Communications System

The most notable flaw during Hurricane Katrina evacuation efforts was the breakdown in emergency communication. A 2009 report by the Government's Accountability Office (GAO) listed six serious inefficiencies in emergency response capabilities. Out of those six, emergency communications was ranked first (GAO, 2009). Vertical communication failures occurred between local, state and federal authorities;

horizontal failures continued between regions and within municipalities. As Mayor Ray Nagin said in *The Great Deluge*:

I got cell phones from as high up as the White House that didn't work. My Blackberry pin-to-pin was the only thing that worked. I saw the military struggle with this, too. No one had communications worth a damn (Brinkley, p. 341).

In New Orleans, storm surges destroyed one communications tower, while floodwaters damaged another two causing a catastrophic failure in communications throughout the city. In Plaquemines Parish, the storm destroyed the only communications tower and their Emergency Operations Center. As a result, all 911 communications failed for three weeks. In St. Bernard Parish, winds destroyed communications towers, antennas, and communications buildings; both sheriff and fire department personnel had to be evacuated. Additionally, the Sheriff's Office in Jefferson Parish lost its primary communications tower (Dowden, 2006).

With the loss of all essential communications infrastructure, the New Orleans metropolitan area relied

on voice radio, which caused the channels to collapse under the massive amount of communications. Single-band walkie-talkies could not support the needed volume of calls. Without consistent radio communications, it was impossible to maintain ground-to-air contact. People died in homes and on houses because communication failure delayed search-and-rescue efforts. In addition, the absence of a working communications network resulted in the exaggeration of crime and violence reports, such as looting and murders in the Superdome, resulting in national and international media hysteria and hyperbole (Baum, 2006).

Prior to Katrina, “stovepipe” systems in place allowed first responders to communicate within their own jurisdiction or agency, but not with others. Police could not talk to the fire department and ambulances could not coordinate with police. This poorly managed communications infrastructure led to ineffective coordination of resources, lack of situational awareness, and put first responders, military

personnel, and civilians in harm’s way (New Orleans Urban Area Security Initiative, 2007).

Katrina proved that all government agencies needed to be on an interoperable, redundant communications system, which would allow agencies of varying levels and municipalities to communicate and coordinate (Cahalan & Renne, 2007). In 2003, Orleans, Jefferson, St. Bernard, and Plaquemines Parishes applied for interoperable communications system grant funding from the Department of Justice and the Office of Community Oriented Policing Services (COPS). These four parishes make up the Louisiana Region 1 Communications Network (LAROC). The COPS grant offered qualified regions in the United States funding to build interoperable communications systems and increase capabilities. LAROC originally requested approximately five million dollars, with the requirement of a cash match from the region of over one million dollars. Between 2003 and 2005, LAROC conducted a series of planning meetings and workshops, but did not complete

the project in time for Hurricane Katrina.

After Katrina, emergency managers recognized and placed much greater emphasis on completing the interoperable communications system. The LAROC strategic plan called for an effective, redundant, voice and data communications systems that shared law enforcement and first responder information across parish and jurisdictional boundaries during hazardous incidents and day-to-day operations (New Orleans Urban Area Security Initiative, 2007). The Office of Emergency Communications (OEC), under the Department of Homeland Security that was created out of the Post-Katrina Emergency Management Reform Act, provides technical assistance, coordinates regional emergency communication efforts, and conducts outreach to all grant funded areas. The LAROC, along with state and federal partners developed a Tactical Interoperable Communications Plan (TICP). Using the Interoperability Continuum, which has five areas of implementation (governance, standard operating procedures, technology, training and

exercises, and usage), made a measurable tool available to help the region meet federal requirements.

By January 2007, 18 months post-Hurricane Katrina, the LAROC developed a state-of-the-art system. The project is called the Project 25 (P25), and its backbone is a 700/800 MHz system that allows for voice interoperability amongst all public safety personnel. This system provides a single shared dual-mode digital, trunked system (2007). The P25 radios and the single shared, dual-mode 700/800 MHz digital trunked radio system eliminated the need for gateways or patches, used when there are multiple disparate radio

systems (U.S. Department of Homeland Security, 2007). This allows for Fire, Emergency Medical Services, and Police of all four parishes to still communicate on one channel even in the event of a collapsed tower. Hurricane Katrina showed that gateways and patches couldn't handle large quantities of voice communications at the tactical level agencies.

The four parishes jointly own and operate P25, governed by the Regional Communication Advisory Board, comprising equal representation from the four parishes and the State of Louisiana (New Orleans Urban Area Security Initiative, 2007). The system has capabilities to communicate with dissimilar systems, and now stands

fully compatible with the Louisiana's 700 MHz system. Today, emergency managers routinely cite the P25 system as a major improvement and asset for managing future events (M. Kallmyer, personal communication, August 18, 2010).





4. New Orleans Hotel and Lodging Visitor Evacuation Plan

Note: The New Orleans Hotel and Lodging Visitor Evacuation Plan is a component of the City Assisted Evacuation Plan but the authors deemed this section of the plan worthy of individual review.

Discussions of a city’s responsibilities to assist vulnerable populations with evacuations use the term “vulnerable” to refer to low-to-moderate income residents with limited evacuation means. The vulnerable population is a primary concern for assisted evacuation. However, due to its tourism-based economy, another special needs population exists in New Orleans: hotel guests and tourists who did not visit New Orleans with an emergency evacuation plan. Prior to and during Hurricane Katrina, no separate, customized plan existed to evacuate tourists and visitors in New Orleans. As a result, Hurricane Katrina trapped thousands of hotel guests inside the city. All other transportation methods of evacuation other than automobiles shut down. Car from rental companies were in short supply or sold out before the mandatory evacuation (D. Karl, personal communication, August 11, 2010).

The Louis Armstrong International Airport closed on August 28th, and many guests with return flights could not leave before Katrina made landfall. Some hotels offered guests the option

to stay at the hotel during the course of the storm (Mowbray, 2005). Others, however, forced guests to leave the hotel with no evacuation plan (“Superdome evacuation”, 2005).

With no other viable option, some hotel guests ended up at the Superdome and the Convention Center (“Leave,” 2005). Like everyone living at these shelters, they suffered lack of food, running water, and highly unsanitary and unsafe conditions. Visitors able to remain at their hotels had significantly better experiences than those at shelters of last resort, but they too still experienced dangerous scenarios. Glass windows broke, looters attempted to gain access, and water flooded the first level of many hotels (“Superdome evacuation,” 2005).

After Hurricane Katrina, the government received heavy criticism for its poor response in evacuating hotel guests. Additionally foreign tourists reported first responders and rescue crews gave preferential treatment to American citizens (Townsend, 2005). A group of Australian tourists accused the federal

government of refusing to permit consular officers into the New Orleans area, and for failing to contact the Australian embassy of the location of a missing Australian citizen in a correctional facility on minor charges (Sales, 2005). In short, Hurricane Katrina exposed major shortcomings in visitor evacuation planning. According to the Convention and Visitors Bureau there are 30,000 hotel rooms that may be inhabited during hurricane season and there must be a plan for guests to safely evacuate the city.

After Katrina, state and local governments recognized the crucial

need for a separate evacuation strategy focused exclusively on tourists and visitors. Together they established the New Orleans Hotel and Lodging Visitor Evacuation Plan (NOHLVED) in 2006. The plan activates either when the mayor’s office initiates the CAEP or when a convention organization requests assistance in evacuating their attendees. Under this plan, visitors have three options. Anyone with prearranged air or ground transportation plans that does not require city evacuation assistance will be asked to leave the city immediately. Those whose departure dates do not coincide with the evacuation schedule will be

told to contact their airline company or rental car company to change their date of departure in an effort to secure their own transportation out of the city. Finally, the hotel staff will direct those unable to do either to staging centers for bus transportation to Louis Armstrong International Airport (NOHLVEP, 2008).



To make arrangements for emergency evacuation plans, NOHLVEP keeps constant communications with commercial airline companies and emergency planners. Airlines will ensure all visitors have an opportunity to leave the city via plane prior to the airport's closing, regardless of whether the visitor obtained a ticket for departure. In the event of an evacuation, many airlines will send more planes, while others may choose to send charter planes. The contribution made by airlines varies from company to company. Regardless, all visitors will receive the chance to procure a seat on a plane leaving the city. Because of volume of visitors that will leave the city by plane in the two days before a hurricane makes landfall,

not everyone will be able to return directly to their hometown. Some visitors take a flight to an alternate city and from there can make arrangements to return home (D. Karl, personal communication, August 11, 2010).

The NOHLVEP planning committee consists of a representative from the New Orleans Metropolitan Convention and Visitors Bureau (NOMCVB), who serves as the round-the-clock emergency contact for the NOMCVB Rapid Response Team (NRRT), and a group of executive staff network with city and state officials to ensure smooth transitions through each phase of the emergency plan. The NRRT is a group of essential personnel that serves as a conduit of emergency information and a support system for visitors: conventions and meeting organizations, travel professionals, NOMCVB members and industry partners, visitors and media, as appropriate. Its members include:

- President and CEO
- Vice President, Finance & Administration

- Vice President, Convention Sales
- Vice President of Tourism
- Vice President of Client Relations
- Vice President of Communications & Public Relations
- Director of Information Technologies
- Executive Director, Greater New Orleans Hotel and Lodging Association
- General Manager, New Orleans Convention Center (NOHLVEP, 2010)

The plan assists visitors in all emergencies, not just hurricanes. The City of New Orleans and other hospitality partners have integrated the plan into their own emergency responses, in order to prepare for a number of different types of emergency situations, which, in addition to hurricanes, includes fire, structural damage, flood, tornado, power outages, medical emergencies, bomb and terrorist threats (NOHLVEP, 2010). The evacuation of visitors and tourists prior to Hurricane Gustav was an overwhelming success. 30,000 visitors safely evacuated by 3:30 PM on August 31st, 2008,

one day before Gustav made landfall.

Approximately 14,000 of these visitors reported to one of the two staging points within the NOHLVEP.

Gustav also provided learning and tweaking opportunities. Tourists unfamiliar with the term “CAEP” did not know if the CAEP was mandatory or voluntary. When the CAEP activated during Gustav, evacuation was still voluntary. 24 hours later, evacuation orders became mandatory. Many guests did not elect to use the CAEP until the evacuation became mandatory. Others thought the CAEP’s activation meant the threat of danger was imminent and they had to leave the city immediately. Regardless of these limitations, Hurricane Gustav demonstrated that there was a sound strategy for evacuating tourists during a hurricane or other disaster (D. Karl, personal communication, August 11, 2010).



5. City of New Orleans' Emergency Operations Center

New Orleans' City Hall is located in the Central Business District of New Orleans and opened for business in 1957. The New Orleans Office of Homeland Security and Emergency Preparedness (NOHSEP) is currently located on the ninth floor of this building.

In the event of a major event, the Emergency

Operations Center (EOC) is set up in NOHSEP. Nationwide, these centers function as the physical space capable of handling an increased amount of personnel from a slew of response agencies during a major event. During Hurricane Katrina, the City of New Orleans' EOC was ill equipped to handle the magnitude of the disaster and operational continuity suffered during the immediate crisis. Today, the New Orleans' EOC occupies a state-of-the art all-inclusive space designed to withstand a major hurricane and to remain operational during all-hazards events. Opened in 2009, the new EOC offers major improvements in square footage, communications capabilities and physical layout from the EOC used in 2005.

Prior to the new EOC, according to the Office of Homeland Security, FEMA consistently rated the City of New Orleans' EOC "poor" in terms of its physical ability to handle a major event pre-and post-Katrina. As late as 2008, before the new EOC opened, FEMA wrote that the New Orleans EOC "lacks space to support interrelated

functions adequately in a common area. The limited space hinders the ability of even a select few Emergency Support Functions (ESFs) to coordinate agency and multi-agency activities effectively and efficiently” (FEMA 2009). During Hurricane Katrina, the New Orleans EOC occupied a ninth floor space inside the City’s Chief Administrative Office. It measured just 1,500 square feet, had one small conference room that could accommodate approximately 12 people, and three offices along with six workspaces. During evacuation activation, the EOC could accommodate a maximum of 18 seats, according to former Deputy Director of the Office of Emergency Preparedness Matt Kallmyer. Because of the increased and intense workload, the Office of Emergency Preparedness transformed an Internet Technology Learning Center on the eighth floor of City Hall into an extension of the EOC. The physical divide between floors caused communication problems during the aftermath of the storm. Kallmyer commented, “The eighth floor conference room was set up with incident management teams. It was like a shadow EOC,” (M. Kallmyer, personal

communication August 18, 2010).

Many functions of the emergency response happened on the eighth floor without communication from the ninth floor and vice versa until emergency planners realized that the fragmented operations had to be unified.

About a week and a half after Katrina, the EOC moved across Poydras Street from City Hall into three ballrooms inside the Hyatt Hotel (P. Bodenheimer, personal communication August 16, 2010). “It was an empty room, not even a chair,” said Peter Bodenheimer, a

former City of New Orleans technology contractor who helped set up the EOC inside the Hyatt Hotel. “We had it up and operational in about 48 hours,” he said. Bodenheimer said that 20-hour work days consumed emergency responders trying to set up the room, and that without the help of an Army unit it would have taken even longer. “They were young guys, we just pointed at computer boxes and had them start moving them to where they needed to go.”

Discussions surrounding a permanent EOC began while emergency responders worked inside the Hyatt hotel. From concept to opening, the City’s new EOC



took four years to complete.

In the summer of 2008, the EOC occupied the same location it did before Hurricane Katrina. However, the renovation of the former City Planning Commission office into the new EOC was underway. During Hurricane Gustav, the overflow of the EOC went to the shelled out former City Planning Commission office. According to Kallmyer, other than serving as a meeting room space and a place to feed individuals, the shell of the City Planning Commission offered little in terms of an upgrade to the EOC.

In October 2009, after leveraging approximately \$2,000,000 of city capital projects funding with state and federal homeland security grants, the new City of New Orleans EOC opened (M. Kallmyer, personal communication). In 2010, the city added a 600 Kilowatt generator valued at \$550,000 on the roof of City Hall. This generator is capable of running the entire EOC in the event of a power loss.

The new EOC measures 10,000 square feet and has a dedicated communications room with a satellite push to talk phone as well as a HAM radio system, National Warning System, and UHF-VHF radios on top of the P25 interoperable communications system discussed in more detailed in this paper. It also includes Broadband Global Area Network (BGAN) satellite dishes for loss of Internet, office cubicles for day-to-day staff activity and the ability to expand and house seat 96 people in the event of activation. Each seat comes equipped with a landline phone and an Internet enabled computer.

- Operations section: 58 seats
- Planning section: 14 seats
- Logistics section: 10 seats
- Finance/purchasing: 8 seats
- IT: 2 seats
- Communications: 8 seats

The City of New Orleans desperately needed a new physical place to handle major events; despite taking nearly four years to complete, the emergency management team at the City of New Orleans is now



6. Tulane University's School of Public Health Disaster Management Program

Hurricane Katrina caused more than \$150 million in physical damage to the campus of Tulane University and forced the layoff of 160 faculty members and 400 full-time staff members (Cowen, 2006). The university closed for four months, and students attended other universities around the country. Tulane, burdened by financial problems and faced with

an uncertain future, reevaluated its mission and streamlined its operations in order to achieve financial stability. The University President and Board of Directors devised a new strategic plan to make the institution academically stronger, more focused and more financially secure. This restructuring led to the combination, reduction, and removal of many academic areas. However, even as Tulane eliminated five of seven undergraduate engineering programs, a third of its medical school faculty, and more than half of its doctoral programs, the reorganization led to several initiatives by the university to create new programs for emergency preparedness and disaster recovery (Schiff, 2005).

In the fall of 2006, Tulane University launched the country's first Masters in Public Health in Disaster Management (Vann, 2006). Dr. Maureen Lichtveld, chair of Environmental Health Sciences at Tulane University's School of Public Health and Tropical Medicine (SPHTM), spearheaded the program. The Disaster Management track offers a Masters in Public



Health in Disaster Management (in New Orleans, or through distance learning), a Doctor of Public Health (Dr. PH) and an interactive online disaster management graduate certificate (Tulane SPHTM, 2010). The MPH program in Disaster Management educates both recent college graduates and professionals with previous experience in the field. The course of study encompasses core elements of a public health curriculum, as well as specialized courses focusing on disaster management areas, such as communication, environmental, psychosocial, and population issues. In addition, students complete a 200-hour practicum and a “Culminating Experience” thesis in which they design, implement, and present a case study in their area of interest. This equips degree holders to perform four main functions:

- Apply public health science, policy, and practice principles to address the health threats resulting from natural and intentional disasters
- Integrate environmental public health strategies in the development, execution, and evaluation of each core component of disaster

management: preparedness, detection, response, containment, and recovery

- Implement population-based interventions to protect communities, particularly vulnerable populations, from natural and intentional disasters

- Evaluate the capacity of public health systems to effectively and efficaciously respond to natural and intentional disasters (Tulane SPHTM, 2010).

Although Tulane previously offered disaster-related training, Dr. Lichtveld thought it was important to combine them as a single program to improve collaboration and cooperation. “Katrina

helped to show the lack of a trained workforce and the need for science to respond in an effective fashion” (Vann, 2006). Influenced by her experiences, she felt that there were not enough environmental health scientists in the city after the hurricane to gather necessary samples and coordinate the return of the city’s residents. The School of Public Health’s Disaster Management track is unique in integrating environmental health science with population sciences (Vann, 2006). The multidisciplinary approach of the program gives students and professionals a broad spectrum of skills; for example, the practical scientific skills of how to gather water and soil



samples, as well as knowledge of population issues needed to manage communication in an emergency. The diverse group of students, which includes first responder professionals such as police and firefighters, recent college graduates, and mid-career professionals in public health and disaster management fields, enhances the interdisciplinary nature of the Disaster Management program. There are currently about 30 students on Tulane's Disaster Management track, with around three quarters taking classes at the New Orleans campus (M.V. Lichtveld, personal communication, August 11, 2010).

The Disaster Management track has become the most popular offered by the Environmental Health Sciences Department. Graduates continue on to positions in the private sector, non-governmental, humanitarian, and governmental organizations. The online certificate program, which targets working public health professionals, has proven successful as well. Most participants consider it so valuable

that they continue on to complete the master's degree.

Emphasis on the practical experience forms an essential component of the Disaster Management program. 20 academic faculty members and working field professionals teach the courses. (M.V. Lichtveld, personal communication, August 11, 2010). They use recent documents and publications as classroom material to ensure that the students have access to the most relevant and current information. The required practicum component of the program gives students a minimum of 200 hours of real life experience in health and safety, private industry, and homeland security.

The Disaster Management program graduates' interdisciplinary knowledge, varied professional positions, and up-to-date practical experience have significantly improved readiness to handle disaster detection, response, and recovery in the post-Katrina era both locally and nationally. While this is particularly true in New Orleans,



Tulane's Disaster Management program also has strong applications in other communities because the program focuses on scientific principles that can be widely applied. The School of Public Health's close connection to the Peace Corps attracts students who have served internationally in disaster areas, as well as people who plan to combine their degree with Peace Corps service through the Masters International program. Students have the opportunity to do their practicum internationally, as well. In the future the program will be offering courses to professionals in Haiti, Asia, and the Middle East (M.V. Lichtveld, personal communication, August 11, 2010).

Dr. Lichtveld plans to continue development of the program to tackle remaining national weaknesses in the public health disaster management system. This will be accomplished through expanding coverage to all communities, addressing health disparities, and improving research. Offering training to all state healthcare providers will help ensure every community has trained disaster responders. Investigating the

role of health disparities during and after a disaster will allow disaster workers to particularly target policies to special needs populations (Vann, 2006). Dr. Lichtveld also hopes to expand the doctoral degree program, which currently has only a few students, because existing data gaps still hampers effective emergency response (M.V. Lichtveld, personal communication, August 11, 2010). Doctoral students would be essential for research contributions in fields such as public health and environmental policy decision-making, community resilience, and health systems preparedness (Tulane

University, 2010).

The disaster management track at Tulane's SPHTM significantly advances emergency preparedness in New Orleans post-Katrina by improving the education and interdisciplinary experience of emergency response professionals. The program's emphasis on scientific methods and theories give students relevant knowledge in areas such as environmental health, toxicology, biostatistics, psycho-sociology and law. This multi-disciplinary approach will allow them to work more effectively in a wider range of disaster areas and understand the unique and far-reaching challenges posed by the disasters.



7. University of New Orleans, Center for Hazards Assessment, Response, and Technology (CHART)

In November of 2004, Professor Shirley Laska of the Center for Hazards Assessment, Response, and Technology (CHART) of the University of New Orleans, published a paper entitled “What if Hurricane Ivan Had Not Missed New Orleans?” (Laska, 2004). Laska noted failures that would have occurred if Ivan had hit the

city in 2004, including the failure of the levee system, and multiple challenges of evacuation. Laska determined New Orleans inadequately prepared to deal with that kind of catastrophe, and concluded, “Hurricane Ivan had the potential to make the unthinkable a reality. Next time New Orleans may not be so fortunate” (2004). A mere eight months later, on August 29, 2005, Hurricane Katrina devastated the New Orleans and the entire Gulf Coast.

Laska founded CHART in 2001 because she wanted to promote Louisiana’s sustainability through an applied social science program (M.Farris, P. Jenkins, J. Kiefer, personal communication, August 12, 2010). Beginning with just four graduate assistants and a few other faculty advisors, including Professor Pam Jenkins, the program has since had 75 graduate and upper level students, including 22 current graduate level students (M. Farris, personal communication, August 13, 2010). In the years prior to Katrina, CHART engaged in multiple projects aimed at engaging the community in the

issue of sustainability and reducing the risk of disasters, such as the FEMA-funded repetitive flood loss reduction project in Louisiana and Texas. Through similar projects, members of CHART developed strong ties with Gulf Coast communities that have strengthened in the wake of Hurricane Katrina. CHART also had strong governmental relationships prior to Katrina, specifically with FEMA Region VI and the HUD, the later awarding CHART its first grant to complete a study on loss and attachment in Grand Isle, Louisiana. Even before Hurricane Katrina, the emergency management research community considered CHART a respected voice and contributor.

When Hurricane Katrina hit New Orleans, UNO's CHART suffered structural damage, making its offices inhabitable until mid-January 2006 (M. Farris, P. Jenkins, J. Kiefer, personal communication, August 12, 2010). Further exacerbating the situation, the UNO internet servers stayed down for months, making it very difficult to obtain grants, since the researchers had to submit requests through a server

unaffiliated with UNO. Working from any place they could find, including coffee shops, hotels, and even a rented apartment Uptown in New Orleans, members of CHART continued to push for the importance of their research. In the aftermath of the hurricane, federal grants and funding increased, as did the overall general interest in CHART's work (M. Farris, P. Jenkins, J. Kiefer, personal communication, August 12, 2010).

After Katrina, the members of CHART began to shift their focus with an entirely new perspective due to Katrina and its aftermath. They had lived through disaster; they currently live through recovery.

CHART began to focus on vulnerable populations, such as the elderly, in emergency management, a shift stemming from the realization that the elderly made up the majority of people the most severely affected by Hurricane Katrina (M. Farris, P. Jenkins, J. Kiefer, personal communication, August 12, 2010).

As Professor Pamela Jenkins noted, the researchers of CHART are both "the subject and object of the event" (M. Farris, P. Jenkins, J. Kiefer, personal communication, August 12, 2010), which gives their results unique perspective. As outside academics enter the region, CHART offers a different approach to emergency



management research. Not only have they lived through the disaster, but they also live in these communities and are therefore irrevocably connected to them. As Professor John Kiefer notes, CHART researchers tend to be more sensitive and respectful of these communities, because they are a part of this community (M. Farris, P. Jenkins, J. Kiefer, personal communication, August 12, 2010).

Furthermore, Professor Kiefer notes that many in CHART use a Participatory Action Research (PAR) method, which centers the research within the community. (M. Farris, P. Jenkins, J. Kiefer, personal communication, August 12, 2010). Researchers work with communities to develop practical solutions for emergency preparedness, while preserving the integrity of the community (West, Alcina, Peterson, & Laska, 2008).

Because CHART undertakes their research as a collaborative process between the community and the researcher, it brings a new intimacy of understanding to wider worlds of emergency

management research.

CHART's affiliation with the University of New Orleans also enables them to provide a critical local resource for officials at all level of government. While CHART earned respect within disaster management research before Katrina, after the storm they saw an increase in funding for mitigation projects, like community elevation, and an increase in invitations to conferences and panels (M. Farris, P. Jenkins, J. Kiefer, personal communication, August 12, 2010).

In April 2010, UNO CHART members, along with colleagues from North Carolina State University, submitted recommendations for long term recovery from a catastrophe to Congress, informed by their experiences and research during Katrina (Farris et al., 2010). CHART members identified issues and offered recommendations in a variety of areas where the federal government can build a stronger and more effective recovery system, including public assistance, human recovery, hazard mitigation, and systems

engineering. Such reports are vital for the federal government, as they not only identify systemic downfalls, but also recommend solutions. They also indicate areas needing the most improvement, ideally, in turn, influencing areas in which the government chooses to emphasize.

While CHART has a relationship with the federal government, they also maintain close ties with local government. After New Orleans developed the CAEP, Lt. Colonel Jerry Sneed called CHART on behalf of the Mayor's Office, asking that they conduct a survey of evacuees focusing on their level of satisfaction with CAEP (M. Farris, P. Jenkins, J. Kiefer, personal communication, August 12, 2010). CHART members Professors Kiefer, Jenkins, Laska, and 20 graduate students randomly interviewed selected participants from the CAEP database (Kiefer, Jenkins, & Laska, 2009). From the survey, Kiefer, Jenkins, and Laska (2009) determined that "evacuation preparedness had improved significantly since Hurricane Katrina." While the results were easily accessible to the general public, members of the Office

of Homeland Security commonly referenced it as it identifies the major failures of the system. For instance, the most common complaint of the evacuees concerned the bus rides and experiences in shelters. Participants frequently reported that drivers were woefully unprepared with comments like "bus driver went to sleep on the road" and "went into a ditch in Alexandria" (Kiefer, Jenkins, & Laska, 2009).

The research CHART provides emergency managers is invaluable. As academic researchers, the members of CHART are trained to study and identify successes and the challenges of emergency

preparedness using scientific methods.

However, the researchers of CHART provide the City of New Orleans with a unique perspective that comes from living in the communities where they conduct their research. As Professor Kiefer noted, the communities that they work in are also the communities they eat, shop, and even live in. This influences the way CHART works in addition to influencing the data they are able to obtain from participants. It is not only that citizens in these communities trust the academic researchers of CHART, but it is also that they are able to be there before, during, and after the disaster. As a result, they are



able to identify the improvements and remaining problems of relief, mitigation and recovery efforts. They are able to obtain data that not many academic institutions would be able to, which makes them vital to the field of emergency management.



8. Closure of the Mississippi River Gulf Outlet (MRGO) and the construction of the Inner Harbor Navigation Canal Surge Barrier (IHNC)

On March 29, 1956, Congress authorized the construction of the Mississippi River Gulf Outlet (MRGO) to create a shorter, safer way for ships to reach the Gulf of Mexico from New Orleans. Secondly, the route was expected to stimulate economic development of the city (Carter & Stern, 2006). Started in 1958 and completed

in 1968 by the United States Army Corps of Engineers (USACE), the 76-mile shortcut shaved 40 miles off the traditional route to the Gulf of Mexico via the Mississippi River. However, even in early stages of its development, controversy surrounded the MRGO construction. Some argued costs of the MRGO far outweighed the benefits, and would lead to wetland loss and an increase in hurricane damage. For years after the construction, different groups attempted to close the MRGO, including as recently as 1998, when the St. Bernard Parish Council unanimously voted to close the channel (Grunwald, 2005). However, no attempt found success. The Port of New Orleans and the Corps of Engineers heavy support of the MRGO, also known as “Mr. Go” to locals, until Katrina, thwarted all attempts for closure.

Along with local attempts to close the channel, a variety of academic research supported the claims that of the channel as a hurricane highway. In 2002, LSU produced a study validating this belief, due to the MRGO’s



predilection for flooding during tropical storms and hurricanes (Grunwald, 2005). Furthermore, the federal government in 2004 funded a simulation drill of a hurricane that concluded “...surges from a Category 3 hurricane would overwhelm the MRGO ‘funnel’, flood surrounding areas and kill tens of thousands of people.” (Grunwald, 2005, p. 2) Although the channel only accounted for three percent of the Port of New Orleans’s business, and MRGO’s cargo totals had dropped by over half since 1994, belief in its economic importance made city officials reluctant to close the channel, despite troublesome findings from research. As a biologist stated to the Washington Post, “The general feeling was: There’s no way we’re closing that. They wanted all the business they could get” (Grunwald, 2005).

On May 19, 2005, Hassan Mashriqui, a computer modeler at LSU’s Hurricane Center, created a model to demonstrate the effects of the MRGO during a hurricane (Grunwald, 2005). The model showed that the outlet would “... increase the storm surges by 20 to 40 percent.”

Despite multiple warning signs that indicated the destruction the MRGO could potentially cause, the channel continued to operate. It was not until August 29, 2005, when Hurricane Katrina devastated the area and caused massive flooding in St. Bernard Parish and the Lower Ninth Ward work began to close local channels academics and locals had decried for so many years. In November 2005, the USACE stopped all work on the channel, and in mid-2006 Congress gave the Corps 3.3 million dollars for the creation of a de-authorization plan for the MRGO (Carter & Stern, 2006). Six months later, in December 2006,

the USACE submitted a plan to close the MRGO to all navigation to the Gulf. Finally, on June 5, 2008, after the Assistant Secretary of the Army for Civil Works sent the final report to Congress, they officially de-authorized the MRGO.

It is important to note that Congress did not close the MRGO solely due to public pressure; they finally investigated and discovered the wealth of scientific research that supported the channel’s closure. On August 4, 2006 Nicole T. Carter and Charles V. Stern, analysts in Natural



Resources



Policy in the Resources, Science, and Industry Division, submitted a report to Congress regarding the MRGO (Carter & Stern, 2006). The report evaluated issues surrounding the MRGO, including wetland loss, hurricanes, and the MRGO's potential role as a hurricane highway. Using the Interagency Performance Evaluation Task Force (IPET)'s analysis report as one of their main source of information, researchers reported failures of the levee system on the MRGO were the main cause for the flooding, and subsequent destruction of, St. Bernard Parish. Furthermore, wetland degradation exacerbated by the MRGO contributed to flooding. When considering the MRGO as a potential hurricane highway, the report notes part of the MRGO did not increase the storm surge, but the MRGO "...hydraulically connected Lake Pontchartrain and Lake Borgne, and allowed the Lake Borgne waters to be pushed into the interior of New Orleans towards Lake Pontchartrain" (Carter & Stern, 2006). They also found that the MRGO contributed

significantly to both to the storm surge level and speed of the water.

In July 2009, a year after the MRGO de-authorization, the USACE completed construction of the 352,000-ton rock closure structure on the MRGO ("History of MRGO", n.d.). However, engineers designed the rock closure structure to close the channel as a viable navigation route, not to protect the area from storm surges. For that reason, the USACE began construction of the Inner Harbor Navigation Canal (IHNC) surge barrier (Grissett, 2009). During Katrina, levees breached along the IHNC, which connects the Mississippi River and Lake Pontchartrain as well as in the Ninth Ward ("Inner Harbor Navigation Canal Surge Barrier", n.d.). In 2006, Congress authorized that IHNC surge barrier, which, similar to a floodwall, aims to protect New Orleans's high-risk areas from storms surges coming from the Gulf of Mexico and Lake Borgne. They awarded Shaw Environmental & Infrastructure the construction contract in April 2008, with a projected



completion date prior to the 2011 hurricane season. Because of the very limited time frame in which Shaw simultaneously designed and built the surge barrier, it is the largest design-build civil works projects in USACE history. Ultimately, with the construction of the surge barrier, the USACE hopes to achieve 100-year risk reduction by 2011. However, as Masako Hirsch noted, Hurricane Katrina was not a 100-year event; it was a 400-year event according to scientific studies (Hirsch, 2010). While the Corps currently works on recommendations to Congress for improvements in protection against a Category 5 hurricane, New Orleans must continue to rely on other resources to protect itself from the damage of high-level hurricanes.

The destruction caused by the MRGO reached far beyond storm surges. Scientists also charge MRGO with the loss or conversion of an extensive amount of the coastal wetlands. According to Carter & Johnson, navigation channels such as the MRGO contribute to wetland loss in the state of Louisiana, as these channels cut through wetlands and change the

movement and saline balance of the waters (Carter & Johnson 2006). Movement and saline balance of the waters maintain the fragile ecosystem of the area. Once disrupted, it often results in massive wetland loss. In 1999, the Corps estimated that the construction of MRGO alone had directly contributed to the loss or conversion of 20,000 acres of wetlands.

Wetland loss results in serious economic, social, and ecological costs. Wetlands provide an invaluable resource for the ecosystem, and they severely decrease hurricane damage. In

one study in their report, Carter and Johnson estimated that wetlands annually reduced the cost of hurricane damages from \$2.2 billion to \$520 million (Carter and Johnson 2006). When the MRGO destroyed thousands of acres of wetlands, it not only displaced thousands of species and disrupted the ecosystem; it contributed to future damage caused by hurricanes. In response to the massive environmental problems facing the region, the USACE is currently developing the MRGO Ecosystem Restoration Plan, a comprehensive plan to help areas affected by the MRGO (“MRGO Restoration study”, n.d.). The USACE





considers wetland protection and restoration, shoreline protection, bank stabilization, and multiple other areas in which opportunities exist to improve and restore the ecosystem of the area. While it is difficult to imagine damage created by the MRGO can ever be reversed, the USACE is taking the right steps, both in terms of hurricane protection and ecological restoration, to undo the damage begun decades ago.

The MRGO is arguably the single most costly engineering mistake in the history of the USACE. In November 2009, the courts confirmed this, when a federal judge found USACE liable for the construction of the MRGO and its role in the destruction resulting from Hurricane Katrina. The court awarded four plaintiffs \$720,000 in total (“Judge Holds Army Corps Responsible for Katrina Damage”, 18 Nov 2009). This landmark decision held the USACE liable for the damage of one of their structures, and held them accountable for the role the structure played in the amplification of the effects of a natural disaster. In the end, the public, the government,

and even the legal system recognized that the MRGO exacerbated the devastating effects of Katrina and would surely have increased the effects of many resulting hurricanes. The closure of the MRGO reassures the residents of New Orleans that the city and the federal government continue to take corrective steps to protect their residents from potentially devastating impacts of hurricanes.



9. National Emergency Child Locator Center

The lack of sufficient preparation, and the sheer volume of residents in need of evacuation assistance, made keeping track of every individual's status and location upon evacuation impossible during Hurricane Katrina. Many families reported their child or children as missing after being transported into or out of the city. In the few months following Katrina and Rita, 5,192 children had been confirmed as

either missing or displaced (NCMEC, 2006). During disasters, children are extremely vulnerable and require special care and consideration. Without proper nurturing and provision of shelter, food, and clothing, their states of health, both physical and mental, suffer tremendously (Brandenburg et al, 2007). A historical review of children's psychological responses to disasters suggests that the most common mental disorders that children post-disaster are Post-Traumatic Stress Disorder (PTSD), anxiety, and depression. Another common reaction is specific fears. For instance, after a hurricane, many children refuse to shower or bathe because they associate bathing with water from the hurricane. In some cases after a disaster children become much more dependent on others, and suffer separation anxiety when away from parents or guardians.

Psychological researchers have found children separated from their families in a disaster show greatly exacerbated symptoms of all these disorders, and that they persist for



a substantially longer period of time than for children that remained with their family throughout the duration of the disaster (Vernberg, 1996).

It was not until September 5, 2005, one week after Katrina made landfall, that the National Center for Missing and Exploited Children (NCMEC) established the Katrina Missing Persons Hotline and website. Launched at the request of the U.S. Department of Justice, it attempted to reunite missing children with their families. In addition to the hotline, the NCMEC worked with parents, family members, law enforcement agencies across the country, social service agencies and other non-profit organizations to ensure that children would be found and returned to their respective families (NCMEC, 2006). Despite the strong efforts made by the NCMEC, the process of locating missing and displaced children took over six months to complete (de Vries, 2006).

Realizing a completed child and family unification system was necessary for future

disasters, Congress called upon the NCMEC to develop and operate the National Emergency Child Locator Center. The center was established under the Post-Katrina Emergency Management Reform Act of 2006 (Post-Katrina Act). Responsibilities allocated to the National Emergency Child Locator Center include establishing and maintaining a toll-free hotline and website to receive reports and provide information of displaced children, deploying staff to the location of a disaster to obtain more information on the displaced children, providing information to the public about additional resources, partnering with federal, state and local law enforcement agencies, and referring reports of displaced adults to the Attorney General's designated authority and the National Emergency Family Registry and Locator System. Emergency officials refer anyone under 21 years of age or searching for someone under 21 years of age to the National Emergency Child Locator Center (Post-Katrina Emergency Management Reform Act, 2006).



The center is located in Alexandria, Virginia at the NCMEC headquarters, with a back-up facility in Lake Park, Florida (NCMEC, 2006).

Following its establishment in October of 2006, the National Emergency Child Locator Center first activated during the California wild fires of 2007. The federal government enacted both the hotline and website, with expert volunteers and paid staff assisting local law enforcement agencies in locating missing children. Today, in addition to working with governmental agencies, the Center partners with nonprofit organizations (Actions to Implement the Post-Katrina Act, 2008). One such partner, the American Red Cross, maintains the Safe and Well website that disaster victims can use to communicate with family and friends outside of the disaster area, and assure them that they are “safe and well” (Red Cross, 2006). The main goal of the National Emergency Child Locator Center and its partners is to ensure that in the event of a future disaster, all displaced children will be reunited with their families as quickly as possible.





10. Creation of FEMA Administrator

From “Brownie, you’re doing a heck of a job” to “I got FEMA’d” tee-shirts in New Orleans, blunders surrounding the federal response to Hurricane Katrina became an international news topic as well as fodder for legislative action after the event. According to the Government Accountability Office (2008), FEMA underperformed in Hurricane Katrina. Both the United States Senate and House of

Representatives acted swiftly in 2006, with a set of serious corrective legislative changes to the Department of Homeland Security and Federal Emergency Management Agency (FEMA) through the Post-Katrina Act of 2006. Sweeping legislation made hundreds of policy changes to federal response in emergencies and President George W. Bush signed the legislation into law in October 2006 (GAO, 2008). The Post-Katrina act creates the position of FEMA administrator, which carries elevated stature in the federal government and job requirements that include extensive emergency management and executive leadership experience.

Michael Brown, the director of FEMA during the immediate aftermath of Katrina, shouldered most of the criticism. After a series of missteps and growing impatience from the American public, Brown resigned on September 12, 2005. One of loudest criticisms during the outcry leading to Brown’s resignation was his lack of emergency management experience before joining FEMA. For ten years before joining FEMA in 2001, Brown worked as the Stewards and Judges

Commissioner of the International Arabian Horse Association (CNN, 2005). Brown's former title was the Under Secretary for Emergency Preparedness and Response/DHS (previously re-titled as the Under Secretary for Federal Emergency Management). The Post-Katrina Act abolished the position of Under Secretary for Federal Emergency Management and created the position of FEMA administrator to replace it (Congressional Research Service 2006). Under the Post-Katrina act, the FEMA administrator must have extensive professional emergency management and executive leadership experience. Appointees shall be selected "from among individuals who have...a demonstrated ability in and knowledge of emergency management and homeland security; and...not less than five years of executive leadership and management experience in the public or private sector (Congressional Research Service 2006)."

James Lee Witt, former FEMA director during the Clinton Administration, described the FEMA Katrina response as "a stake [had] been driven through the heart of emergency

management" (USA Today, 2005). According to the Congressional Research Service, the Post-Katrina Act elevated the FEMA Administrator to a higher level within DHS by "raising the status of the FEMA Administrator to the Deputy Secretary level, increasing the scope of his or her responsibilities, mandating that he or she report directly to the Secretary, and giving him or her a statutory advisory relationship to the President, the Homeland Security Council, and the Secretary, particularly during disasters (Congressional Research Service 2006)."

International attention placed on emergency

management leaders is intense and extreme during emergency. The creation of the FEMA administrator ensures that a qualified and trained person is in charge of the crisis event.

As the country witnessed during Hurricane Katrina, Brown's questionable emergency management qualifications often overshadowed government-wide deficiencies in the immediate aftermath of the crisis.



11. University of New Orleans, Merritt C. Becker, Jr. UNO Transportation Institute (UNOTI)

In mid-August 2005, Dr. John L. Renne moved to New Orleans to begin a newly appointed Assistant Professorship in Urban Planning and Transportation Studies at the University of New Orleans. Barely settled, less than 10 days later, he and his wife joined thousands of others as they fled the direct path of Hurricane Katrina. The catastrophic event significantly impacted Dr.

Renne’s research focus and, ultimately, the study and practice of evacuation and transportation planning. “In the days following Hurricane Katrina, the world watched in disbelief as all systems indiscriminately failed to respond, affecting young, elderly, poor, and disabled alike. As I evacuated, I recall feeling guilty and somewhat responsible that my profession, transportation planning, failed to deliver an effective plan for a disaster that everyone knew would happen. It became part of my mission to ensure that we do not repeat past mistakes, not only in New Orleans but also across the country” (Renne, 2007).

After Hurricane Katrina, Dr. Renne established The Transportation Equity and Evacuation Planning Program at the Merritt C. Becker, Jr. UNO Transportation Institute (UNOTI). The program, designed to provide research and outreach to improve evacuation planning and practice for all members of society, has grown significantly since its inception. Under Dr. Renne’s direction, he and the UNOTI faculty,



staff, and students engage in the development and implementation of research projects, conferences, seminars, and workshops, which bridge transportation and emergency management professions, as well as establish dialogue between local, parish/county, state, and federal government entities. Dr. Renne describes the evacuation of New Orleans for Hurricane Katrina as both a great success and a miserable failure. As a success, it saw 1.2 million people with access to a car safely evacuated via an effective contra-flow system; as a failure, those without access to a car or other means of transportation were literally left behind. Addressing the issues of this “carless society” became the focal point for the Transportation Equity and Evacuation Planning Program’s first project.

On February 8 - 9, 2007, The National Conference on Disaster Planning for the Carless Society was held at the University of New Orleans’ Lindy C. Boggs International Conference Center. In addition to UNOTI, co-hosts included the New Orleans Regional

Transit Authority and the New Orleans Regional Planning Commission. The conference was a watershed moment, bringing together a diverse group of stakeholders from non-profits, for-profit organizations, government, academia, and the community at-large to discuss the importance of creating plans and implementation strategies to effectively evacuate those without access to cars. The conference offered one of the first opportunities for the disabled and for members of the non-profit sector to directly engage government officials, emergency managers, and planners in a discussion

of these complex issues. In turn, the conference birthed a new agenda in transportation planning.

Since that inaugural gathering, much work has been done by UNOTI faculty, staff, and students to engage others and forward the awareness, discussion, research and education of effective evacuation planning for the most vulnerable members of our society. In 2007, the Federal Transportation Administration’s Office of Civil Rights funded a four-year study led by UNO’s Department of Planning and Urban Studies and UNOTI, The National Study on Carless and Special Needs Evacuation Planning, with Dr. Renne as the principal

investigator and Dr. Thomas Sanchez of Virginia Tech as co-principal investigator. The study collaborates with the Urban Affairs and Planning Program at Virginia Tech, the Center for Hazards Assessment Response and Technology (CHART) at UNO, the Department of Sociology at UNO, the Civil and Environmental Engineering Department at LSU, the Center for Neighborhood Technology based in Chicago and the Victoria Transport Policy Institute based in British Columbia. Its goal is to research how state departments of transportation, metropolitan planning organizations, transit agencies, and local governments consider, in the context of their emergency preparedness planning, unique needs of minority, low-income, elderly, disabled, and Limited English Proficient persons, especially in households without vehicular access. In addition to collecting and documenting agency plans, practices, and philosophies, the project includes a comparative evaluation and assessment to identify particularly effective and innovative practices. To date, the work published from this study

includes:

- National Study on Carless and Special Needs Evacuation Planning: A Literature Review. Funded by the Federal Transportation Administration (J. Renne, T. Sanchez, T. Litman, 2008).
- The National Study on Carless and Special Needs Evacuation Planning: Government and Non-Profit Focus Group Results. Funded by the Federal Transportation Administration (J. Renne, P. Jenkins, T. Sanchez, R. Peterson, 2008).
- National Study on Carless and Special Needs Evacuation Planning: Case Studies. Funded by the Federal Transportation Administration (J. Renne, T. Sanchez, R. Peterson, 2009).
- “Mobilizing Your Community for Emergency Evacuation: Vulnerable Populations” Funded by the Federal Transit Administration, Final Draft, 2010 (J. Renne, T. Sanchez, L. Brown)

Other collaborative efforts on the subject undertaken by Dr. Renne through UNOTI include:

- “Safeguarding Independent Living: Emergency Evacuation of the Elderly and Disabled,” *InTransition*, Spring 2007 (J. Renne, C. Cahalan).
- White Paper on Carless and Special Needs Evacuation Planning—presented at the National Conference on Emergency Evacuation Community Transportation Association of America EXPO, New Orleans, LA, June 2-3, 2008 (J. Renne, J. Ibáñez).
- “Gender Differences in Self-Reported Evacuation Experiences: An Analysis of the City Assisted Evacuation Program During Hurricane Gustav.” Peer Reviewed Article – Accepted for Publication in the Proceedings of the 4th International Women’s Issues Transportation Conference (P. Jenkins, J. Renne, J. Kiefer, 2009).
- “Challenge of Evacuating the Carless in

Five Major U.S. Cities: Identifying the Key Issues,” *Transportation Research Results: Journal of the Transportation Research Board*, Vol. 2110, pp. 36-44, 2009 (J. Renne, T. Sanchez, P. Jenkins and R. Peterson).

The work of UNOTI continues to grow and impact the study and practice of evacuation planning on local, national, and international levels. Research conducted by Dr. Renne since Hurricane Katrina reveals that New Orleans is not unique with its carless population and disaster vulnerability. Rather, he found that evacuation plans in most major American cities fail to adequately address the needs of the elderly, disabled, and transit-dependent populations. In the five years since Hurricane Katrina, relationships fostered amongst those who have partnered with UNOTI in the many projects related to transportation and evacuation planning reached new heights. We can’t necessarily control when a disaster is going to occur, but we have the power to be prepared (Renne, 2007). The tremendous amount of work undertaken for these projects could not have been performed without the commitment of many



individuals, as well as industry and organizations, that have donated time, personnel, and/or funding to the UNOTI projects.



12. UNO/LSU with the Gulf Coast Center for Evacuation and Transportation Resiliency (GCCETR)

Federal sponsorship by the University Transportation Center (UTC) enabled the creation of the Gulf Coast Center for Evacuation and Transportation Resiliency (GCCETR) in 2008, directed by Dr. Brian Wolshon from LSU and assisted by Dr. Vinayak Dixit from LSU and Dr. John Renne, Dr. James Amdal and Dr. Billy Fields from UNO. It focuses on “evacuation

and transportation resiliency in an effort to address the multitude of issues that impact transportation processes under emergency conditions such as evacuation and other types of major events,” according to the center’s website. The GCCETR completes another link in the process of increased knowledge production about how and what conditions result in evacuations.

Dr. Brian Wolshon, director of the GCCETR, pioneered research in the area of traffic flow during evacuations. After conducting research in 2003, Wolshon’s findings led to a revision of the contra-flow plans for New Orleans. Unfortunately he both predicted failures, and subsequently observed his predictions come to life, in the old contra-flow system during Hurricane Ivan in late 2004. Improved plans, implemented just days prior to Hurricane Katrina, met huge success: over one million residents evacuated the New Orleans metro area.

Both LSU and UNO pioneered new research in the area of traffic simulation specifically targeted to the improvement of evacuation. The US Department of Transportation (USDOT) developed a project that modeled New Orleans at a regional scale for emergency transportation planning and analysis UNO/LSU used the computer software package TRANSIMS to develop the model. This research was a major milestone because such large-scale simulations, which can track the individual movements of vehicles, had not been attempted for the purpose of modeling an evacuation. The benefit of using such large models is that much more detail can be generated so that differences in evacuation planning can be more precisely measured. The next step in this research involves developing alternative hurricane scenarios and testing new strategies to further smooth the evacuation process. The lessons learned from this project will also be carried over into a similar model being developed for the Houston region. The US Department of Homeland Security is sponsoring this research.

On February 3 – 5, 2010, The National Evacuation Conference was held in New Orleans. The conference was co-organized by Dr. Renne, Dr. Brian Wolshon of the GCCETR the Stephenson Disaster Management Institute (SDMI) at LSU. A successor to the 2007 Carless Conference discussed above, this conference brought together over 300 participants and leaders from government, industry, academia, and non-profit organizations. The interest and commitment expressed by attendees at the conference resulted in the establishment of The National Evacuation Conference as a biennial event, hosted in different regions of the country. The

next conference will be in 2012. The 2010 conference also resulted in two special issue journals agreeing to publish top papers from the conference: Journal of Transportation Safety and Security and Risk, Hazards and Crisis in Public Policy. Papers published from the first conference focus on describing traffic movement that was observed 48 hours in advance of the storm. One major discovery was the fact that traffic flows seen during the evacuation were actually lower than the flows observed during normal rush-hour traffic. Further research into answering the question of why this is true is currently underway at the GCCETR. GCCETR's work is proving to be a vital tool at answering emergency evacuation questions.



13. Evacuteer.org

In 2006, the City of New Orleans unveiled the City Assisted Evacuation Plan (CAEP) as an alternative to the “Shelters of Last Resort,” the Superdome and the Ernest N. Morial Convention Center. In the summer of 2008 Hurricane Gustav became national news. It disrupted the Republican National Convention, becoming topics of water cooler conversations and broadcaster commentary around the country as

it increased to a Category 5 storm in the Gulf of Mexico. In advance of Hurricane Gustav, Mayor Ray Nagin activated the CAEP for the first time. Americans during the two days of evacuating watched as over 18,000 New Orleanians left their city on chartered buses to destinations around the state and the American South. What viewers didn’t see were over 200 volunteers – young and old, native and new transplants, offering skills and manpower to assist the evacuation. Over the course of the evacuation and the re-entry 219 Evacuteers answered phones, tagged baggage, registered pets and interpreted for non-English speakers.

Evacuteer.org, a 501c3 community-based organization, after several Hurricane Gustav volunteers recognized that the City must rely on engaged citizens to successfully execute the CAEP. Evacuteer.org incorporated as a non-profit organization in the State of Louisiana on June 8, 2009, and received approval as a 501c3 tax-exempt entity by the IRS on August 17th, 2009. The organization recruits,



trains, and manages evacuation volunteers (evacuteers) who assist with the CAEP. Through an existing agreement with the City of New Orleans Office of Homeland Security and Emergency Preparedness (NOHSEP), the City of New Orleans has authorized evacuteer.org to manage all volunteers who work within the CAEP at 17 neighborhood pick-up points, at the Union Passenger Terminal (UPT) for evacuee processing, and at City Hall to assist with hotline operation.

Evacuteer.org's mission is to mitigate loss of life and reduces search and rescue costs in a post-disaster New Orleans by increasing evacuation cooperation through targeted, strategic and well-executed pre-disaster outreach and awareness techniques as well as give opportunities for New Orleanians to assist and keep their neighbors safe. The catalyst for evacuteer.org was the first ever activation of the City Assisted Evacuation Plane in advance of Hurricane Gustav.

Robert X. Fogarty, then Mayor C. Ray Nagin's volunteer coordinator during Hurricane Gustav, recognized that hurricanes will continue to threaten New Orleans and that there will be a substantial portion of the City's population who will need to utilize the CAEP. Evacuteer.org maximizes the efficiency of citizen volunteers by identifying and training citizens and community leaders before disaster strikes to aid and enhance the City of New Orleans, State of Louisiana and federal government's objectives.

Evacuteer.org recognizes that mass evacuations have the potential to outpace

the capacity of government. Executing a safe, successful evacuation requires every day people to explore the civic potential they have to impact and add value to the government's goals and objectives in protecting its citizens. Its recruitment/training/coordination model is derived from firsthand experience of its founder as well as from studying the positives and negatives of other preparedness organizations including the American Red Cross and Citizen Emergency Response Teams (CERT). The evacuteer.org model invests heavily in utilizing free or inexpensive new media channels such as Facebook and Twitter

to recruit members and generate community goodwill. It also believes in the power of nontraditional training styles, including testimonial videos with emotional impact, quick hitting facts about the importance of the plan, and guest speakers.

Evacuteer.org's training program is one day and has three components. In 2010, over 500 people went through trainings that were conducted nearly every Saturday throughout hurricane season. The American Red Cross donated a class trainer and classroom space. The evacuteer.org CAEP component of the training is detailed, thorough, and uses real life examples and experiences, illustrated with photos from the actual Gustav CAEP evacuation. Evacuteer.org trainers make clear expectations about the roles of evacuteers in the multi-agency plan, and typically have a member of the City's Office of Emergency Preparedness on hand to answer any questions that evacuteer.org trainers are not in a position to answer.

- 9am-12pm: Psychological first aid administered by Red Cross
- 12pm-1pm (Experiential Lunch/Learn) How to open and eat a Meal Ready Eat (MRE)
- 1pm-3pm Evacuteers and the City Assisted Evacuation Plan

The CAEP is activated upon orders from the Mayor, in concurrence with the Governor, following the declaration of an emergency. The Mayor's declaration of an emergency must be followed by a specific order to the Director of NOHSEP to activate the CAEP. If the CAEP is activated, evacuteer.org leaders begin a series of call downs to partner organizations and unaffiliated evacuteers. During evacuteer.org training sessions, one of the most important topics covered is personal preparedness, safety and responsibility. At the end of each training session, evacuteer.org trainers go over the expected timeframe of the CAEP. Buses begin to pick up evacuees at the H-54 hour mark and continue until the H-12 hour mark.

The H-hour describes the time when tropical storm force winds hit the Louisiana coastline. Every evacuteer.org training session closes with a reminder that the CAEP is a very stressful situation for all involved and that evacuteers must have taken all personal preparedness steps (ie, evacuation plans, boarding windows, etc) before reporting to work. After each training session, evacuteer.org also sends a post-training reflection forms that captures important data about the training and more importantly, each evacuteer's comfort level in regards to staying their own personal evacuation.

The organization has been featured on CNN, National Public Radio, the Huffington Post, the Times-Picayune, ABC 26, Fox 8, WDSU and the Gambit for its community and citizen engagement strategies and preparing New Orleanians for future storms. To date, the organization has 27 non-profit, faith based and neighborhood based partner organizations and has over 700 "evacuteers" ready to assist should a mandatory evacuation be called. Long term projections for the organization include a

nationwide proof of concept in New Orleans to export to other American cities and working with the City of New Orleans to commission public art to double as hurricane evacuation pick up point markers for the CAEP.

Limitations

The 13 improvements described in this study are what we systematically deemed the most positive changes to emergency preparedness and disaster management in post-Katrina New Orleans. However, not all of these improvements are strategically sound. As such, we have observed some limitations in some of these changes in emergency preparedness and have highlighted these limitations as possible areas of development. Shortcomings of improvements listed in no way diminish their current contributions to emergency preparedness in the city of New Orleans. The limitations expressed here are simply aspects that could be addressed to strengthen emergency preparedness and disaster response for hurricane seasons to come.

City Assisted Evacuation Plan

If evacuees had a negative experience during the CAEP, it was more than likely in a shelter with

shelter staff. Evacuees' biggest concerns were safety, security, staff, and basic necessities like foods and beds. While in the minority, some people's experiences were significantly poor, so much so that they indicated they would not use the CAEP again. Comments included, "I don't have to go through that again." and "I'm staying home next time and will never go back again" (Kiefer, Jenkins, & Laska, 2009). The most common complaint in regards to the shelters concerned volunteers running them, whom some participants found rude and disrespectful towards evacuees, and "... acted like they didn't want us here" (Kiefer, Jenkins, & Laska, 2009). This report clearly indicates that the government needs to focus not only on providing shelters with basic necessities like food and bed but also on training staff to be more sensitive to the needs, both emotional and physical, of the evacuees.

Broadmoor Improvement Association

Five years post Hurricane Katrina, Broadmoor



leaders report increased difficulty in keeping the community engaged about emergency preparedness issues, as well as neighborhood recovery issues. Recovery and preparedness fatigue is real according to the BIA leaders, and both Voight and Carroll expressed that new members taking over leadership roles would allow for the current leaders to take respite. Many of the “community leaders” who have emerged over the past five years have managed careers and families on top of their civic participation. Likewise, other neighborhoods that practice similar emergency preparedness programs may be feeling the same “burn out” that Broadmoor leaders expressed.

New Orleans Hotel and Lodging Visitor Evacuation Plan

Unlike the New Orleans residents who participated in the CAEP follow-up study, visitors who evacuated from New Orleans during Hurricane Gustav were not afforded the opportunity to express their satisfaction with the

evacuation procedures. No follow-up survey was administered to these particular evacuees, and therefore, we cannot objectively say that the NOHLVEP was a complete success. While all visitors of New Orleans safely evacuated well before H-Hour, we do not know how airlines, hotels, first responders and government officials treated them. Therefore, we suggest the administration of a follow-up survey in the event of a future mandatory evacuation.

City of New Orleans Emergency Operations Center

The EOC partially activated for the British Petroleum (BP) Oil Spill during the summer of 2010, but has not fully activated for a hurricane event since opening in 2008. Concerns still exist that the EOC isn’t fully ready for a major event. For example, since City Hall is classified as a historic building, the EOC cannot have shutters on the outside of the building, which could mean blown out glass in the event of a major hurricane. Here the goal, according to Kallmyer, is to shift windows to Miami-Dade



standard Category Five wind protection. The federal government awarded the City a grant to do this, but the work has yet to start. In another example, a redundant air conditioning unit that is located on the roof of the building is not completely protected from storms. Also, some argue the EOC has insufficient places to bed down emergency personnel who need respite. Currently, there are only six beds on the tenth floor of City Hall and four showers. As of this report (January 2011), the boiler in City Hall remains broken, however, so showers have no hot water. Currently, emergency workers who must hunker down are placed in the Superdome (men: visitor's locker room, women: cheerleader's locker room).

Tulane University Disaster Management Program and the future of Disaster Management Education

Recent tragedies like Hurricane Katrina and September 11 have increased the popularity of continuing education programs in disaster management. Currently around 300 emergency

or disaster management higher education programs throughout the country specialize in in areas including fire, bioterrorism, homeland security, infectious disease, radiological, and natural environmental disasters (Blanchard, 2010). However, this trend worries many disaster management personnel because the educational field lacks standardization. Most programs tailored themselves narrowly, to specific emergency responses, and thus ignore the complex, interdisciplinary nature of the field. Without a big-picture view, practical experience, management training, and grounding in science graduates of these programs may not be properly prepared for success in managing all aspects of a disaster. For example, only about 20 of these disaster-related programs are based in a public health or medical curriculum such as Tulane's (Blanchard, 2010). Therefore it is important to address whether the future of disaster management should emphasize having a core group of well-educated, well-trained leaders or a much larger number of more minimally educated responders.





While the Tulane SPHTM has made great strides to adequately prepare its students for a career in disaster management, one issue that the school still needs to address is encouraging students to remain in New Orleans after graduation. A majority of its students are not natives of Louisiana, and thus once they graduate, many of them leave the state to work elsewhere. In order to retain these well-trained graduates, Tulane must create more incentives for its students to stay in New Orleans after graduating. Dr. Lichtveld stated that they have low enrollment rates of native New Orleanians, but she's said that they are implementing initiatives to attract local students.

UNO CHART

While the research findings that UNO's CHART provides is extremely valuable to the City of New Orleans, their research methodology requires some changes. Their studies do not incorporate a disclosure indicating that researchers themselves also experienced the

disaster firsthand, and may be affected by it. That they have also been personally exposed to the disasters may impact their ability to maintain objectivity.

MRGO/IHNC

The closure of MRGO and the construction of the IHNC are both man-made approaches to protecting the New Orleans area from the effects of hurricanes and other storms. However, man-made technology caused loss of storm protection, as well as the loss of wetlands in the first place. Man's continual interference with natural processes may yield even more detrimental effects in years to come. FEMA Administrator Qualifications

According to the policies put in place regarding qualifications for the FEMA administrator required by the Post-Katrina Act, it appears that Michael Brown would still be eligible to lead the agency given his previous experience with the agency. Does this mean that the written



qualifications changes are null and void? We believe that although Michael Brown may have been qualified for the FEMA administrator position with the new job requirements, after Hurricane Katrina, any administration will appoint a seasoned, vetted emergency manager to lead the agency. David Paulison, who took over for Brown in 2005, and Craig Fugate, the current FEMA administrator, possess much more emergency management experience than Brown had during Hurricane Katrina.

LSU/UNO Gulf Coast Center for Evacuation and Transportation Resiliency

According to the GCCETR's founders, the center exists to provide world-class research in the areas of evacuation and transportation research. While the cross-university collaboration seems to be working currently, the distance between organization (LSU is located in Baton Rouge, LA and UNO is located in New Orleans, LA) leaders is a limitation that must be pointed out when describing effective communication between

representatives from the University of New Orleans and Louisiana State University. University of New Orleans, Merritt C. Becker, Jr. UNO Transportation Institute (UNOTI)

UNOTI and Dr. John Renne have proven to be leading voices on evacuation and transportation for carless residents over the past five years and have achieved significant success. Like all good teams, Dr. Renne must have a good supporting cast behind him to continue to achieve the results they have moving forward. The researchers believe that continuing to grow and diversify evacuation and transportation experts is ultimately the most health objective for by providing them world-class training at UNOTI.

Evacuteer.org

Evacuteer.org has long-term financial sustainability questions that must be answered for it to remain relevant in emergency preparedness in New Orleans, as well as to expand its reach to other Gulf cities. Since its



creation in 2009, the organization has struggled to attract public and private financial support, despite receiving high marks from its volunteers, the City of New Orleans and many major media outlets. Currently, the organization is still run on a day-to-day, volunteer basis by Robert X. Fogarty and a committee of committed volunteers. The organization believes that this is a natural step for young organizations to go through, but it in turn becomes a potential threat to the long-term sustainability of the organization. Like the Broadmoor Improvement Association, volunteer or citizen engagement burnout threatens the organization. This be addressed by consistently involving new individuals in the organization, as well as developing long term financial support.

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