

3-2018

Getting Out: An Investigation into the Failures of the New Orleans Hurricane Katrina Evacuation Process and What Could Have Been Done Differently

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Recommended Citation

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Getting Out:

An Investigation into the Failures of the New Orleans Hurricane Katrina Evacuation Process and What Could Have Been Done Differently

Found in the New Orleans City Archives' Mayor Nagin Collection is a letter written to the mayor in 2004 detailing concerns about the sustainability of the city, in the event of a Hurricane.¹ The letter was written by George H. Troxell Jr., a West Point graduate with a Masters in Engineering from the University of Illinois.² Mr. Troxell, in retirement at the time of the letter, during his career worked for an oil company in Belgium.³ His role at the company was to design and engineer the oil rigs to be able to withstand the rough seas, and waves that sometimes reached close to 100 feet in height.⁴ In his letter to the mayor, Mr. Troxell expressed his concern that New Orleans was woefully underprepared for a hurricane and, the letter opens with the line, "Once again we have been reminded by a front page article in *The Times-Picayune* of the fact that New Orleans is a potential death trap in the event of a hurricane of the wrong path and intensity."⁵ This underscores Mr. Troxell's concern which he goes on to express. He believed that the levees, pumps and drainage systems were not up to the task of keeping the city dry in the event of a major storm.⁶ In an urgent plea, Mr. Troxell called for the mayor to launch an investigation, in conjunction with the Army Corp of Engineers and private firms to ensure that New Orleans was safe and "so that mass evacuation is not a requisite for survival."⁷ While it is

¹ George H. Troxell Jr., letter to New Orleans Mayor C. Ray Nagin, July 26, 2004.

² George H. Troxell III, phone conversation with the author, June 5, 2017.

³ Ibid.

⁴ Ibid.

⁵ Troxell Jr.

⁶ Ibid.

⁷ Ibid.

now clear the warnings in this letter were not heeded, the line about mass evacuation being a requisite for survival turned out to be shockingly prophetic.

Although the unprecedented physical damage was unavoidable, the loss of life was not. Had everyone been properly evacuated, no one would have died. While it is clear that it is nearly impossible to completely vacate a major American city, steps can be taken to be sure the highest number of people possible get out, steps Mayor Nagin did not take.

The evacuation process in the leadup to Katrina's landfall has been studied for problems and inefficiencies. The tragedy of Hurricane Katrina can teach government officials and citizens of coastal communities many valuable lessons, and for this reason it is crucial to revisit that catastrophe and study the mistakes made. This investigation explores several key questions. Were the evacuations, both the voluntary and mandatory, declared early enough and would declaring them any earlier have made a difference? Was the message of the impending storm conveyed with the necessary volume and intensity? Was the special needs population adequately evacuated? Were there any successes in the evacuation process that can be studied as a positive example? Lastly, should city officials have known Katrina could happen and should they have been better prepared? All of these questions are essential to determining what went wrong in the Katrina evacuation, and each help to answer a specific area of failure. The hope is that by knowing the answer to these questions, government officials at all levels can better prepare for hurricanes and prevent the loss of human life.

In order to better understand why he made the decisions he did, it is essential to understand the background of former New Orleans Mayor, Ray Nagin. Ray Nagin was not a typical mayor. Born to a low-income family in New Orleans in 1956, he worked his way to a degree in Accounting from Tuskegee University and a Masters of Business Administration from

Tulane University.⁸ With this education, he climbed the corporate ladder to become the Vice-President of Cox Communications, where he gained business experience he would try to use as Mayor of New Orleans.⁹

Nagin although a Republican for most of his life, ran as a Democrat in the New Orleans mayoral race of 2002.¹⁰ This was interesting because Nagin was a known supporter of President Bush, and a contributor to his campaign.¹¹ He also supported Republican Bobby Jindal for Governor in 2003.¹² The Republican support was not one directional however, in his mayoral race, Nagin received much support from both parties.

In his campaign, Nagin made it a promise, if elected to run the city government more like a business, a model he was used to and thought would be beneficial for the city of New Orleans.¹³ He vowed to cut corruption and waste, both noble causes, as well as to develop a plan to run the city more efficiently.

The plan to run the city as a business, as well as Mayor Nagin's apparent desire to appeal to both sides are possible explanations for the failures that will be outlined in the ensuing pages of this report. While these traits are certainly not entirely to blame, and the idea of running a government like a business is not always a bad idea, it is clear that these mindsets hampered Mayor Nagin's ability to make decisions that would fully evacuate the city of New Orleans. This is particularly so because they caused him to fear the economic and political repercussions

⁸ Andrew Stevens, "Ray Nagin former mayor of New Orleans," *City Mayors*, August 24, 2017.

⁹ Ibid.

¹⁰ Ibid.

¹¹ Ibid.

¹² Ibid.

¹³ "Ray Nagin For Mayor," *bestofneworleans.com*, last modified January 22, 2002.

as well as the legal liabilities that would follow a mandatory evacuation if Katrina missed his city.

Hurricane Katrina began over the Bahamas on Tuesday, August 23rd, 2005 as Tropical Depression Twelve, a humble storm by comparison with wind speeds of only 35mph.¹⁴ Twelve quickly turned into Hurricane Katrina and struck the southeastern Florida coast on Thursday, August 25th, 2005 as only a shell of its future self. The Category 1 storm produced 80mph winds and left six people dead as it made landfall in Miami-Dade and Broward Counties.¹⁵

Hurricane Katrina entered into the Gulf of Mexico on Friday, August 26th, 2005 and quickly gained strength, rising to a Category 2 storm with sustained winds of over 100mph by Friday night.¹⁶ The storm quickly progressed towards the Louisiana and Mississippi coasts, gaining in size and force as it churned in the warm waters of the Gulf, eventually reaching the highest ranking on the Saffir-Simpson scale as a Category 5 storm with winds nearing 200mph.¹⁷

Early in the morning around 6:00 on Monday, August 29th, 2005, Hurricane Katrina slammed into the Mississippi coast near Gulfport, only 65 miles from New Orleans, as a strong Category 3 storm with sustained winds around 125mph and a storm surge of up to 28 feet.¹⁸ As would be discovered in the ensuing weeks and months, Katrina in her wake left over \$100 billion in damages and close to 2,000 dead in Louisiana, Mississippi, Alabama, and Florida. These

¹⁴ Associated Press, "Storm Watch," *Times-Picayune* (New Orleans, LA), Aug. 24, 2005.

¹⁵ See: Jill Barton, "Katrina batters south Florida; 2 killed," *Times-Picayune* (New Orleans, LA), Aug. 26, 2005. John Pain, "Six killed as Katrina lashes south Florida," *Times-Picayune* (New Orleans, LA), Aug. 27, 2005.

¹⁶ Mark Schlefstein, "Local officials gear up as storm creeps in Gulf," *Times-Picayune* (New Orleans, LA), Aug. 27, 2005.

¹⁷ Bruce Nolan, "Preparing For The Worst," *Times-Picayune* (New Orleans, LA), Aug. 28, 2005.

¹⁸ Kim Ann Zimmermann, "Hurricane Katrina: Facts, Damage & Aftermath," *Live Science*, August 27, 2015.

numbers are close to unprecedented in United States hurricane history with Katrina being the costliest and one of the deadliest since records have been kept.¹⁹

In the years since Katrina, New Orleans and the entire Gulf coast region has seen a tremendous resurgence. A city that once appeared as though it might never recover is a booming hub of the South once again. New Orleans' rich culture and traditions are thriving in the post-Katrina era. The journey back has not been easy but many would say it was worth it. One citizen likened it to a forest fire, although the fire may be damaging initially, the forest comes out better in the long run.²⁰ Much like a burned forest, New Orleans is better off in the long run, houses are now more stable, levees and floodwalls are better engineered, infrastructure has improved, and the city's beloved NFL team the Saints even won a Super Bowl, something that has an unexplainable significance to the people of New Orleans.²¹

Declaring the Evacuation

Evacuations, to be effective must be declared a certain amount of time before a hurricane makes landfall. Several hundred thousand people simply cannot be evacuated in a short amount of time. Deciding when to declare that evacuation however, is a delicate balancing act for city officials. Call it too early and there is the risk the storm takes another direction and the evacuation ends up being needlessly costly and inconvenient. Call the evacuation too late and citizens might not be able to get out in time, and their lives will be in jeopardy. Many things must be taken into consideration when government officials are faced with declaring an evacuation, they want to be certain the storm is going to strike while still allowing enough time

¹⁹ "Hurricane Katrina," *HISTORY.com*, 2009.

²⁰ Steve Zimmer (New Orleans resident and recovery expert) in discussion with the author, May 2017.

²¹ Ibid.

to evacuate the entire population. Mayor Nagin was faced with this same balancing act as Hurricane Katrina barreled towards New Orleans in 2005. He did not declare the evacuation soon enough and cost many people their lives.

Hurricane Katrina, then Tropical Depression Twelve, was first reported in *The Times-Picayune*, New Orleans' local paper, on Wednesday, August 24th, five days before it made landfall on the Gulf coast, in an Associated Press article complete with a graphic showing the projected path of the storm.²² This was an image that all New Orleanians would have been able to see and surely someone in the mayor's office, if not the mayor himself would have seen. In the projected path, and cone of uncertainty, the bubble around the path that includes anywhere the storm might strike, of then Tropical Depression Twelve was the city of New Orleans. This certainly would not have been a reason to take any drastic actions, as the storm was small and still on the eastern side of Florida, however one would expect a mayor would make a note of this

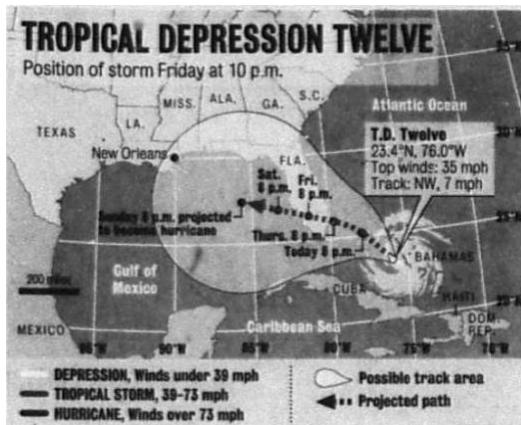


Figure 1

23

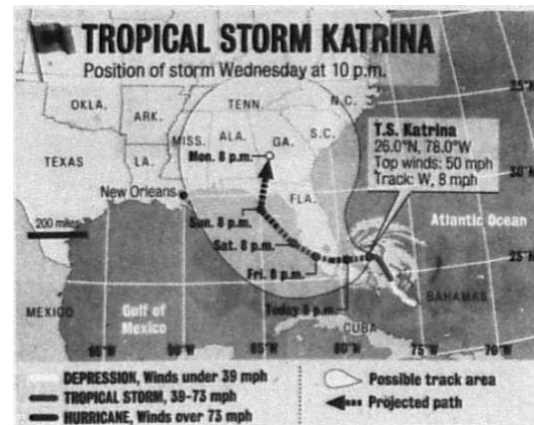


Figure 2

24

and begin to pay very close attention to this storm. The following day, *The Times-Picayune* ran another graphic of then Tropical Storm Katrina that still showed New Orleans on the edge of the

²² Associated Press.

²³ Associated Press. This is the graphic that appeared in the 8-24-05 edition of *The Times-Picayune*, the line at the top that reads "Position of storm Friday at 10 p.m." is a typo, Tuesday should be substituted for Friday.

²⁴ Pain. This is the graphic that appeared in the 8-25-05 edition of *The Times-Picayune*.

cone of uncertainty.²⁵ While New Orleans was not being looked at as the location of landfall for Katrina at that time, it was still being reported as a possibility, and competent city officials would have maintained a sense of alertness to the potential path of the storm.

New Orleans appeared to be out of the cone of uncertainty, albeit still on the fringes of it, by late night on Thursday, August 25th as the storm was passing over south Florida. Early reports on Friday morning kept New Orleans barely in the cone but had the projected path of Katrina pointed at the panhandle of Florida.²⁶ This direction did not last long however, the new projection that came out at 10:00 pm CDT on the Friday before the storm, had New Orleans projected as the direct target of this growing hurricane.²⁷



Figure 3

28

It is at this time, 56 hours out from the eventual landfall, that Mayor Nagin should have begun to make the decisions that would save the lives of his citizens. It was not necessary to declare any evacuations at that very moment but preparations should have begun to do such a thing very soon.

In reference to this very forecast, Mayor Nagin, in his hearing before the United States Senate on February 1st, 2006, claimed that “On Saturday, August 27th, the models, the forecast

²⁵ Pain.

²⁶ Forecast map released at 10:00 am CDT on 8-26-05 by the National Weather Service (NWS) and National Oceanic and Atmospheric Administration (NOAA)

²⁷ Forecast map released at 10:00 pm CDT on 8-26-05 by the National Weather Service (NWS) and National Oceanic and Atmospheric Administration (NOAA)

²⁸ Ibid.

models started to converge. Showing the path of the Category 3 storm had changed, and placing New Orleans in the middle of the projected cone.”²⁹ This was an inaccurate statement as the forecast had New Orleans directly in the crosshairs of the storm Friday night as opposed to “starting” on Saturday. Whether this was intentionally inaccurate or a lapse in memory one cannot know, in either case however, it indicates that if the mayor recalled New Orleans not being in the path of the storm until Saturday, there must not have been any significant action taken Friday night or Saturday morning. This is especially concerning as review has shown that the forecast even 48 hours out from landfall was only off by 56 nautical miles, astonishing accuracy as compared to historical forecasts.³⁰

On Saturday, the same day that Mayor Nagin reports learning that the storm was pointing itself towards New Orleans, others were taking action. The White House issued a statement letting the press and public know that President Bush was taking the storm seriously and declared “an emergency exists in the State of Louisiana”.³¹ The president also “ordered Federal aid to supplement state and local response efforts in the parishes located in the path of Hurricane Katrina beginning on August 26, 2005, and continuing.”³² While this declaration did not cover all the parishes in Louisiana including, for reasons unknown, Orleans Parish, it does show that the Federal Government, and specifically President Bush, was taking Hurricane Katrina seriously.

²⁹ *Hurricane Katrina: Managing the Crisis and Evacuating New Orleans: Hearing on Hurricane Katrina Before the Senate Committee on Homeland Security and Governmental Affairs*, 109th Cong. 10 (2006) (statement of C. Ray Nagin, Mayor of New Orleans, Louisiana).

³⁰ Alex Kirlik, “Lessons Learned from the Design of the Decision Support System Used in the Hurricane Katrina Evacuation Decision” (presentation, Proceedings of the HUMAN FACTORS AND ERGONOMICS SOCIETY 51st ANNUAL MEETING, 2007).

³¹ George W. Bush, “Statement on Federal Emergency Assistance for Louisiana, August 27, 2005,” from *Office of the Press Secretary*.

³² Ibid.

As previously highlighted, evacuations take a significant amount of time to be carried out. Because, thankfully, a full-scale evacuation of a major city is not a regular occurrence it is understandable that the mayor of a major American city would not instinctively know how long it would take to empty their city of its residents. Fortunately, however experts draft plans, often based on extensive studies that help officials to make these decisions with an informed mind. Hurricane Pam was one of these such plans. Developed as a study in July of 2004, Hurricane Pam was a simulation between the Federal Government and the city of New Orleans of what would happen in the event a Category 3 or 4 storm directly struck the city.³³ Orleans Parish, where New Orleans is located was one of the parishes included in the simulation.³⁴ The entire reason for conducting this extensive study was to develop a plan that could be followed in the event that a storm of great magnitude hit New Orleans, a storm much like Katrina. One of the findings in Pam, very relevant to the evacuation process was that the evacuation of the city could take as much as 72 hours.³⁵ The storm was 56 hours out from New Orleans when it was certain that the city was going to be struck, if the recommendations from Hurricane Pam were to be taken seriously then at that time, the city was already behind schedule by 21 hours. Hurricane Pam indicated that evacuation procedures needed to begin immediately upon the release of that forecast. In addition to the Hurricane Pam plan, the State of Louisiana plan called for evacuation procedures to begin 50 hours ahead of landfall,³⁶ which in the case of Hurricane Katrina would have been 4:00 am on Saturday the 27th. The voluntary evacuation for the city of New Orleans as declared by Mayor Nagin did not go into effect until 5:00 pm on the 27th and the mandatory

³³ Select Bipartisan Comm. To Investigate the Preparation for and Response to Hurricane Katrina, H.R. Rep. No. 109-377, at. 81-83 (2006).

³⁴ Ibid.

³⁵ Susan B. Glasser, and Michael Grunwald, "The Steady Buildup to a City's Chaos: Confusion Reigned At Every Level of Government," Washington Post (2005)

³⁶ Schelfstein.

evacuation was not declared until 11:00 am on the 28th, 37 and 19 hours before landfall respectively. While studies and prepared plans can often be outdated or based on information not relevant to the situation at hand, software that uses current information and real-time analysis does not suffer from these same issues. HURREVAC, which stands for Hurricane Evacuation, is government-funded software available to cities around the county, that based on current information and real-time analysis, calculates when an evacuation must be declared to ensure that all citizens evacuate.³⁷ This software is interesting and effective in that it calculates its evacuation times based on the time that tropical storm force winds reach the city, as it is deemed

unsafe to travel in those conditions.³⁸ New Orleans had access to and used this software in the planning stage ahead of Hurricane Katrina.³⁹ The HURREVAC software, assuming that the city would take a direct

Date/Time (hr)	Possible Action	Hrs Left...	to 34K(39)	to 50K(58)	to 64K(74)	to Eye	Day/Night
08/26/05 23EDT	Preparation/Planning	6 to Decide	429 miles	444 miles	456 miles	467 miles	Dark
08/27/05 00EDT	Preparation/Planning	5 to Decide	421 miles	437 miles	449 miles	461 miles	Dark
08/27/05 01EDT	Preparation/Planning	4 to Decide	414 miles	430 miles	443 miles	455 miles	Dark
08/27/05 02EDT	Preparation/Planning	3 to Decide	406 miles	423 miles	436 miles	448 miles	Dark
08/27/05 03EDT	Preparation/Planning	2 to Decide	399 miles	416 miles	430 miles	443 miles	Dark
08/27/05 04EDT	Preparation/Planning	1 to Decide	391 miles	409 miles	423 miles	437 miles	Dark
08/27/05 05EDT	DECISION TIME	42 to Hazard	384 miles	402 miles	417 miles	431 miles	Dark
08/27/05 06EDT	Evacuation(If needed)	41 to Hazard	376 miles	395 miles	410 miles	425 miles	Daylight
08/27/05 07EDT	Evacuation(If needed)	40 to Hazard	369 miles	388 miles	404 miles	419 miles	Daylight
08/27/05 08EDT	Evacuation(If needed)	39 to Hazard	361 miles	381 miles	397 miles	413 miles	Daylight
08/27/05 09EDT	Evacuation(If needed)	38 to Hazard	353 miles	373 miles	390 miles	406 miles	Daylight
08/27/05 10EDT	Evacuation(If needed)	37 to Hazard	345 miles	365 miles	383 miles	399 miles	Daylight
08/27/05 11EDT	Evacuation(If needed)	36 to Hazard	338 miles	358 miles	376 miles	392 miles	Daylight
08/27/05 12EDT	Evacuation(If needed)	35 to Hazard	330 miles	350 miles	369 miles	385 miles	Daylight
08/27/05 13EDT	Evacuation(If needed)	34 to Hazard	322 miles	342 miles	362 miles	378 miles	Daylight

SS Category: 4 Occupancy: Medium Response: Medium Timeline Off Update

hit, which it came very close to doing,

Figure 4

40

recommended that the evacuation decision be made at 4:00 am CDT on Saturday the 27th, or 50 hours ahead of landfall.⁴¹ The screenshot shown in figure 4 is what the HURREVAC software would have looked like at 10:00 pm on Friday when the infamous forecast was released.

If the mayor was using these studies and the HURREVAC software to aid in his decision making, it appears as though the information they were giving him was being ignored. The mayor declared the voluntary evacuation 13 hours after the recommendation of HURREVAC as

³⁷ Kirlik.

³⁸ Ibid.

³⁹ Ibid.

⁴⁰ Ibid. HURREVAC software as it would have looked to the officials in New Orleans including Mayor Nagin. Note that times in the screenshot are Eastern.

⁴¹ Ibid.

well as the State of Louisiana plan, and the mandatory evacuation 31 hours after the recommended time. Furthermore, the declaration for the voluntary evacuation came 35 hours after the time recommended by Hurricane Pam and the mandatory evacuation came 53 hours late. To his credit the earliest an informed evacuation could have been declared was at the time of the forecast at 10:00 pm on Friday, however the evacuations did not come until 32 and 49 hours later. Clearly there was evidence and recommendations to call for an evacuation of the city at an earlier time than was done. This extra time would have been a great benefit to those families that could evacuate themselves and an even greater benefit to those that relied on the City Government to ensure their safety and survival. The fact that the evacuation was declared much later than recommended surely cost people their lives.⁴²

Not all parties that had to make evacuation decisions waited as late as Mayor Nagin to do so. Oil rigs in the Gulf of Mexico began their evacuations on Friday, the same day that the storm made its shift towards New Orleans.⁴³ Private businesses often have a negative image of putting an emphasis on profit above everything else, governments on the other hand should not be making any profit and therefore have no reason to risk lives in a situation such as a Hurricane. However, in the instance of Hurricane Katrina, quite the opposite took place as reported by *The Times-Picayune*, ChevronTexaco Corp, had all of their evacuations in the Gulf complete by Saturday evening, around the same time the mayor was asking the residents of New Orleans to begin theirs. Furthermore, Royal Dutch-Shell, British Petroleum, and ExxonMobil Corp all had

⁴² Also of note is that the National Weather Service declared the Hurricane Watch for New Orleans 40 hours ahead of landfall, 2 hours earlier than the voluntary evacuation. They also declared the Hurricane Warning 27 hours ahead of landfall, 8 hours earlier than the mandatory evacuation. Richard D. Knabb, Jamie R. Rhome, and Daniel P. Brown, *Tropical Cyclone Report: Hurricane Katrina 23-30 August 2005*, special report prepared at the request of the National Hurricane Center, December 2005, 36.

⁴³ Staff "Oil firms evacuate platforms for storm," *Times-Picayune* (New Orleans, LA), Aug. 27, 2005.

conducted their evacuations by Saturday.⁴⁴ It is worth noting that not a single report of a death on an oil rig during Katrina could be found. This goes to show that these private industries were willing to risk the loss of significant amounts of income in order to ensure the safety of their workers, something the city of New Orleans failed to do.

In examining the evacuation procedures that took place before Hurricane Katrina, it is beneficial to examine other hurricanes from the past of significant size and destruction. Three hurricanes that immediately come to mind are Hurricanes Hugo, Andrew, and Floyd. These hurricanes made landfall as a Category 4, 5, and 3 respectively while all creating over \$10 billion in damage in 2017 dollars with Andrew's damages reaching upwards of \$45 billion. One thing that makes these hurricanes different from Katrina however, is that their death tolls by comparison are significantly lower with Floyd's being the highest at 72.⁴⁵

What was done differently before these storms that resulted in less loss of life, than was done in the leadup to Katrina? Hurricane Floyd which struck the coasts of North and South Carolina in 1999 is the shining example of proactive action amongst these three storms. Officials, in the leadup to Floyd declared a voluntary evacuation 43.5 hours before landfall and issued the mandatory evacuation just a few hours later, 38.5 hours before landfall. Hugo, which struck Charleston, South Carolina in 1989 and Andrew which made landfall just south of Miami, Florida in 1992 both declared their voluntary evacuations later than New Orleans did for Katrina at 25 and 35 hours respectively. However, the mandatory evacuation for Andrew came at 23

⁴⁴ Jaquetta White, "Firms close oil rigs in Gulf," *Times-Picayune* (New Orleans, LA), Aug. 28, 2005.

⁴⁵ See: Earl J. Baker, "Evacuation decision making and public response in Hurricane Hugo in South Carolina," *University of South Florida Scholar Commons*, (1990): 1-14., Kristin Dow, and Susan L. Cutter, "Emerging Hurricane Evacuation Issues: Hurricane Floyd and South Carolina," *Natural Hazards Review*, (2002): 12-18., Post, Buckley, Schuh & Jernigan, Inc., *HURRICANE ANDREW ASSESSMENT – FLORIDA: Review of Hurricane Evacuation Studies Utilization and Information Dissemination*, special report prepared at the request of United States Army Corps. of Engineers South Atlantic Division, and Federal Emergency Management Agency Region, January 1993, 5,1-6,5.

hours out, 4 hours sooner than Katrina, and the one for Hugo came one hour later than Katrina at 18 hours out.⁴⁶ These statistics in and of themselves do not indicate that there was a huge blunder committed in New Orleans, as these evacuation times, with the exception of Hugo are not that different than the ones seen before Katrina. However, when examined a little more closely, a significant fact stands out.

Mayors, or whoever the city has designated the responsibility to, typically declare a voluntary evacuation when they know that their city is in the path of a storm. The mandatory evacuation signals urgency that staying in the city could very well result in the loss of life, and also in many localities, allows the city to begin exercising certain powers not available under normal circumstances. Voluntary evacuations for this reason serve as a heads up for citizens so that they can begin to make arrangements and prepare for a coming mandatory evacuation. For this reason, it is striking to see that New Orleans let 18 hours pass between the voluntary and mandatory evacuations. By comparison to the storms previously mentioned, only 12, 7, and 5 hours passed between the two, in the order of Andrew, Hugo, and Floyd. With the declaration of a voluntary evacuation a city and in the case of New Orleans, Mayor Nagin, admits that a danger is coming and staying in place is dangerous. Therefore, once this evacuation has been declared, a responsible mayor should soon follow it with a mandatory evacuation, the only type of evacuation that many people will truly listen to and the type that gives the city the power to assist in evacuating residents. Mayor Nagin however waited 18 hours after the declaration of the voluntary evacuation to declare a mandatory one. For stubborn persons and those without means to evacuate, this amount of time may have very well cost them their lives.

⁴⁶ Ibid.

All of this information begs the question, why didn't Mayor Nagin call for a mandatory evacuation sooner? In his hearing before the United States Senate, Mayor Nagin is asked a question by Senator Susan Collins of Maine that seeks to answer this question. She set her question up by stating "The evidence suggests to me that the delay between when you made the decision and when the order was actually issued, was caused by your staff debating such issues as whether nursing homes and hotels and hospitals should be included, how the order should be enforced, and other pretty fundamental issues."⁴⁷ She then asked the mayor "Shouldn't those kinds of questions have been worked out in advance?"⁴⁸ This question and its setup is key to understanding what took so long. Mayor Nagin in his response claimed that he was trying to sort through the legal issues and his staff was working to make certain that they had the legal authority to declare a mandatory evacuation and that doing so would not create any other problems. Also, in his testimony, Mayor Nagin admitted that he made the decision that a mandatory evacuation was necessary "probably around 7:30 or 8:00 o'clock in the afternoon" on Saturday the 27.⁴⁹ This was 15 hours before the evacuation was actually declared at 11:00 the next morning, a critical 15 hours that would have almost doubled the amount of time available between the declaration of the evacuation and landfall.

A paraphrase of one of the mayor's quotes, touching on this same topic, found in the Sunday, August 28th edition of *The Times-Picayune* reads "Nagin said late Saturday that he's having his legal team staff look into whether he can order a mandatory evacuation of the city, a step he's been hesitant to so because of the potential liability on the part of the city for closing hotels and other businesses."⁵⁰ Both of these examples point to the reason that the mandatory

⁴⁷ Statement of C. Ray Nagin.

⁴⁸ Ibid, 21.

⁴⁹ Ibid.

⁵⁰ Nolan.

evacuation came at such a delayed time was the fact that the mayor was too concerned about having the “legalese” as he referred to it,⁵¹ in order before making the declaration. Nagin didn’t want the city to be held financially accountable by private businesses for lost revenue nor did he want to overstep his bounds and make a statement that he was concerned he didn’t have the legal authority to make.⁵²

All of this information is only critical of the mayor if it can be shown that the delay in calling for a mandatory evacuation order had a tangible effect on the ability or willingness of the citizens of New Orleans to get out. The point has been made several times that a mandatory evacuation could motivate people like a voluntary one could not. A study conducted in 1990 after Hurricane Hugo sought to answer the question of whether or not the word mandatory has an effect on the willingness of people to evacuate. The study found that 89% of those that claimed they had heard an order to evacuate did so compared to only 70% who said to have heard only a recommendation.⁵³ 19% may not seem like a lot but in a city of almost 500,000 people, 19% is around 95,000. This study shows those 95,000 would remain in harm’s way under a voluntary evacuation but if under a stronger type of order would evacuate. This study further examined this phenomenon by referencing hypothetical surveys conducted prior to the landfall of Hugo. These surveys showed that only between 1% - 4% of the residents in the area affected by Hugo would refuse to evacuate even if ordered to do so.⁵⁴

Another study conducted after Hurricane Floyd found that one of the top influencers in the decision as to evacuate were “mandatory orders” along with storm severity and landfall

⁵¹ Statement of C. Ray Nagin.

⁵² See: Nolan., and H.R. Rep. No. 109-377.

⁵³ Baker, 8.

⁵⁴ Ibid, 11.

location.⁵⁵ A third study conducted after Hurricane Andrew that examined traffic flow out of the area before the storm, makes a statement that also supports this idea of mandatory evacuations having a greater impact, “The graphs show some evacuation taking place even before 6:00 am (time of mandatory evacuation) on Sunday in Dade, Broward and Palm Beach Counties, but they show an immediate more pronounced response as soon as the official evacuation order took effect.”⁵⁶ This statement of fact also points to the idea that yes some people will evacuate before the mandatory evacuation takes place but many will wait. One of the conclusions drawn by the Hugo study summarizes this phenomenon perfectly “more would have (evacuated) but did not believe that officials had order them to do so.”⁵⁷ All of this statistical information clearly points to the fact that the word mandatory before evacuation has a tangible impact on the number of people who will get out. Further emphasizing that the mayor’s delay in calling for a mandatory evacuation left people in the path of the storm who would not have been there had the order come sooner.

This is only one effect of many of waiting until Saturday morning to call for a mandatory evacuation. Another significant and eye opening effect of this delay is the fact that the call for the mandatory evacuation order did not make it into New Orleans’ local newspaper, *The Times-Picayune* until the Monday, August 29th edition.⁵⁸ Hurricane Katrina made landfall at 6:00 am on Monday the 29th. If one was relying on *The Times-Picayune* to alert them as to when the evacuation order was issued, they would have heard the 125mph winds and seen the rising floodwaters before reading this information. This delay also had an impact on the procrastinators of New Orleans in the fact that at the same time the mandatory evacuation was

⁵⁵ Dow, 14.

⁵⁶ Post.

⁵⁷ Baker, 14.

⁵⁸ Gwen Filosa, “At least 10,000 find refuge at the Superdome,” *Times-Picayune* (New Orleans, LA), Aug. 29, 2005.

ordered, so was a curfew, set at dusk on the 28th.⁵⁹ This in and of itself was not a bad thing, the curfew came around the time that the Tropical Storm force winds were scheduled to arrive and make travel highly dangerous. However, the late evacuation order paired with the curfew only provided an 11-hour window to leave the city. If a citizen was the most extreme type of procrastinator and had not even begun to prepare for evacuation, this amount of time was drastically small to be able to escape from danger.

These issues previously mentioned are only important to citizens with their own means to evacuate. However, this delay also significantly affected, possibly even to a greater degree those in New Orleans who did not have a way to evacuate themselves. 100,000 or approximately 20% of New Orleans residents did not have their own means of transportation⁶⁰ and in order to get out of harm's way needed the city to provide for them a means to leave. The city's plan called for them to provide buses out of the city to those with a lack of transportation⁶¹ however once the mandatory evacuation had been declared the majority of the drivers for those buses had already left.⁶² One specific instance of this is noted in the House of Representatives Report where it reads "at least one nursing home had been unable to evacuate its patients prelandfall because it could not find bus drivers by the time the mandatory evacuation order was issued."⁶³ Those that were qualified to drive the buses heard the voluntary evacuation notice and in the 18 hours that passed between the two evacuation orders, left the city out of concern for their own safety. This caused there to not be enough drivers for the buses available to transport the needy to safety and resulted in many losing their life.

⁵⁹ Statement of C. Ray Nagin.

⁶⁰ Glasser.

⁶¹ Ibid.

⁶² H.R. Rep. No. 109-377.

⁶³ Ibid.

It is clear that the evacuations were not declared early enough and cost people their lives. While a case, albeit a weak one, can be made that the voluntary evacuation did come at an early enough time there is not a similar case to be made in respect to the mandatory evacuation. It was clearly delivered too late to be fully effective and had far reaching consequences. Had it been issued sooner, it would have made a difference and saved countless lives.

Communication

For citizens of a city to evacuate ahead of a hurricane they must first know that a hurricane is bearing down upon their city and must know how strong and dangerous the storm is. Without scientists to develop accurate predictions, government officials to make informed decisions, and journalist to convey the message, people would have no idea that a storm was headed their way or what actions they needed to take. An essential aspect of evacuation procedure is the conveying of the message that a dangerous storm is coming and residents need to evacuate. To this regard, Hurricane Katrina was no different than any other storm. For the evacuation to be effective, the citizens of New Orleans had to know that the storm was coming and exactly how dangerous it was. Many people and entities responsible for conveying this message did an excellent job, others did not.

New Orleans' local paper, *The Times-Picayune* cannot be blamed for the lack of communication of the threat that Hurricane Katrina posed. From the first day that the storm developed over the Bahamas, *The Times-Picayune* carried information on it complete with a map showing the forecasted path.⁶⁴ The paper carried this information every day until the storm

⁶⁴ See: Associated Press, "Florida in the Sights of next tropical storm," *Times-Picayune* (New Orleans, LA), Aug. 24, 2005., Pain, and Barton.

struck and beginning on Saturday the 27th, the day after the shift towards New Orleans took



Figure 5

place, carried the information on the front page of the paper.⁶⁵ Subscribers to the paper and those who bought it at the stand had the ability to stay informed and see its projected path regardless of the lack of information coming from city officials and the mayor. All that the citizens who were not subscribers had to do, once the

⁶⁶ storm made the front page, to realize the danger that

they were in was pass a paper box or newsstand. Not only did the paper repeatedly run the story but they also sought expert information and graphics to publish in order that the citizens of New Orleans would be fully informed. One specific example of this came when the paper reached out to Ivor van Heerden, a hurricane expert at Louisiana State University (LSU), for the rights to publish his storm surge model, shown in Figure 5, that indicated New Orleans would flood.⁶⁷ For these reasons, *The Times-Picayune* should be applauded, it reached countless residents of the doomed city and conveyed the message that a devastating storm was on its way.

LSU as has already been alluded to was another positive example of how to spread the message of an impending storm. In addition to providing the storm surge map to *The Times-Picayune*,⁶⁸ the Hurricane Center at LSU also sent the map to other media sources, state and local officials, and posted it on the internet for the entire public to see.⁶⁹ Furthermore, staff at the

⁶⁵ See: Schlefstein., Nolan., and Filosa.

⁶⁶ Staff, "No Margin of Error," *Times-Picayune* (New Orleans, LA), Aug. 28, 2005.

⁶⁷ Ivor van Heerden, interview by Peter Standring and Tom Stubberfield, *NOVA*, Public Broadcasting Service, September 10 and October 5, 2005.

⁶⁸ Ezra Boyd, Brian Wolshon, and Ivor van Heerden, "Risk Communication and Public Response During Evacuations: The New Orleans Experience of Hurricane Katrina," *Public Performance & Management Review* 32, no. 3 (2009): 449.

⁶⁹ Ibid.

LSU Hurricane Center reached out, as early as Saturday, to officials with the information that Katrina could be so powerful that it would cause some of the levees to fail.⁷⁰ These actions show that the experts at Louisiana State were taking Hurricane Katrina very seriously and were doing what they could to make sure as many residents evacuated as possible, if only the mayor had been doing the same thing, the aftermath of Katrina might not have been as bad.

For all of his failures in other areas, the mayor did use many third parties effectively in helping to spread the news and encourage people to evacuate. Unfortunately, once many of these efforts began, it was too late or for the ones that did start early, the lack of a mandatory evacuation rendered them ineffective. One good idea that the city had but appeared to be mostly ineffective was to use pastors as a conduit for conveying the message. The offices of Governor of Louisiana Kathleen Blanco and Mayor Nagin both made contact with local pastors encouraging them to urge their congregations to evacuate.⁷¹ However, many of these actions were taken on Saturday, before the mandatory evacuation was declared, and for that reason this idea wasn't as successful as anticipated.

Another successful tactic, although not very original, that the mayor employed was the use of press conferences to deliver his message to as many people as possible. Once he finally decided to declare the evacuations, both the voluntary and the mandatory, Mayor Nagin took to the podium to inform his citizens of the dangers of the storm and to urge them to evacuate.⁷² While this was an action that should have been taken, and the mayor deserves some credit for doing so, it was not enough to counteract the delay in declaring the evacuations in the first place.

⁷⁰ Ibid.

⁷¹ H.R. Rep. No. 109-377.

⁷² See: Boyd, 449., Glasser, and H.R. Rep. No. 109-377.

One other positive thing employed by the mayor to assist in making the citizens of New Orleans aware that a storm was coming and that they were in danger was the New Orleans Police Department. Mayor Nagin as he testified before the US Senate on February 1, 2006 sent the police department around the city to alert everyone the storm was coming.⁷³ “we had all of our police officers to comb the city. And they went out with their lights on, and they went throughout all of the neighborhoods in the city to make sure that people understood that we were moving toward a mandatory evacuation.”⁷⁴ This was a smart and strategic tactic to use and is a good way to spread information, however as the mayor points out, this wasn’t done until the mandatory evacuation declaration which left a short amount for those citizens who had been alerted by the police, to get out.

While there were some successes, as mentioned, in the delivery of the message of Hurricane Katrina, there were also many things that hampered the city’s ability to fully alert their citizens to the coming danger. One significant issue that arose was the confusion caused by the language being used by officials to describe the evacuation, as well as their apparent reluctance to use the word “mandatory”. In the bipartisan House of Representatives report, this problem is alluded to when the various terms that were used as an alternative to “mandatory evacuation” are listed off, “These terms included a “precautionary” evacuation, a “voluntary” evacuation, a “recommended” evacuation, a “highly recommended” evacuation, and a “highly suggested” evacuation.”⁷⁵ This is a problem because as previously addressed, the term mandatory had a much greater significance on the mind of citizens, and often spurs them to action much quicker. In a post-Katrina assessment found in the *American Journal of Public Health*, a survivor of the

⁷³ Statement of C. Ray Nagin.

⁷⁴ Ibid.

⁷⁵ H.R. Rep. No. 109-377.

storm is quoted as saying “They didn’t say it was a mandatory evacuation because if they would have I would have left.”⁷⁶ This further underscore the point that the word mandatory is powerful and also alludes to another problem found in the delivery of the message, from the mayor, to evacuate, of confusion as to what actions should be taken.

In that same report, survivors recalled being told to “go somewhere” but never hearing where to go or how they should get there. It is important to remember that 100,000 New Orleans citizens did not have a car of their own⁷⁷, and if they were going to evacuate it would have to be with the help of someone else, most likely the city. This confusion and resulting lack of information led to many people remaining in their homes for the duration of the storm, and sadly, some lost their life as a result.

Communication is key to governing a city, especially in the face of a catastrophe such as Katrina was. While the city and Mayor Nagin did attempt many unique and useful tactics in relaying the message that Katrina was on her way and posing a serious threat, the holes on many of these tactics and lack of an earlier mandatory evacuation order rendered them mostly ineffective. The confusing language and lack of specific instructions from the mayor and other government officials led to confusion among the citizens of New Orleans, especially those with the fewest means. All of this resulted in far too many people attempting to ride out the storm in their homes and subsequently far too many losing their life.

⁷⁶ David P. Eisenman, MD, MSHS, Kristina M. Cordasco, MD, MPH, Steve Asch, MD, MSHS, Joya F. Golden, BA, and Debora Gilck, ScD, “Disaster Planning and Risk Communication With Vulnerable Communities: Lessons From Hurricane Katrina,” *American Journal of Public Health* 97, no. S1 (2007): S112.

⁷⁷ Glasser.

Evacuating Special Needs Residents

For the majority of residents in any city and New Orleans, the responsibility to evacuate to safety falls on their own shoulders. However, in any city, and especially in New Orleans, there will be an amount of people who for various reasons do not have the ability to evacuate themselves and must rely on family, friends, neighbors, or the government to ensure their transportation to safety. These people are classified as “special needs” in disaster management and it is the responsibility of the entity declaring the evacuation, which in the case of New Orleans was Mayor Nagin, to ensure that they have a way of getting out. The definition of a special needs person can take on many different forms. In this category are people without their own source of transportation, without enough transportation for their entire family, without a place to go even if they can evacuate, without the financial means to evacuate, and those who may be too ill, elderly, or disabled to evacuate themselves. This category of people is large and far-reaching but can be summed up in the idea that if someone cannot put themselves and their family in a car and leave the path of an oncoming storm, they are special needs.

New Orleans has and had a large population of citizens living on fixed government incomes, be it welfare, social security or something similar.⁷⁸ One often overlooked and unfortunate characteristic of Hurricane Katrina was that it made landfall on the 29th of the month. At this point, these incomes had long since arrived and mostly been spent, and with gas prices around \$3 a gallon⁷⁹, driving out of the city was a very costly endeavor. These residents who relied on the government to provide their income would not have been able to financially evacuate themselves due to this basic principle.

⁷⁸ H.R. Rep. No. 109-377.

⁷⁹ Ibid.

On top of those citizens who relied on the government for some or all of their income, there were others who were self-sustaining but still did not have the financial capabilities to evacuate. It was estimated that the minimum cost to evacuate, including gas, food, lodging, and other expenses was around \$600.⁸⁰ Based on the Federal Minimum Wage in 2005 of \$5.15⁸¹ this \$600 cost would equal almost three weeks' worth of labor before tax deductions. For many families, specifically those with only one working parent, spending 6% of the year's total income on a few days of evacuation was unthinkable and impossible. For this reason many people if not assisted by the government or someone else would have no choice but to remain in their homes while the storm wreaked havoc.

Another characteristic of the citizens of New Orleans, even those with means, around the time of Katrina was as has been mentioned, at least 100,000 of them did not have access to their own vehicle and often relied on public transportation to get around the city.⁸² This number correlates to around 57,000 families that without assistance could not escape the wrath of the storm.⁸³ It is not uncommon for residents of a large city to forgo owning a vehicle as public transportation is usually more than sufficient and eliminates the hassles and expense of owning a car. Reports show that city officials knew that the number of residents without their own transportation was high,⁸⁴ and for this reason it would be expected that they would have a plan in place to deal with this reality, unfortunately whatever plan they might have had was insufficient.

⁸⁰ Eisenman, S112.

⁸¹ "History of Federal Minimum Wage Rates Under the Fair Labor Standards Act, 1938 - 2009," *Wage and Hour Division (WHD) of the United States Department of Labor*, July 24, 2009.

⁸² See: Glasser., and Brian Wolshon, "Evacuation Planning and Engineering for Hurricane Katrina," *The Bridge* 36, no. 1 (2006): 32.

⁸³ Ivor van Heerden.

⁸⁴ See: Glasser., and Wolshon, 32.

New Orleans did have somewhat of a plan to deal with this problem but it was, as is evidenced by the amount of people left in the city, clearly insufficient. In attempting to understand why the city did not evacuate its citizens who could not evacuate themselves, it is important to first examine what the designed plan was prior to Katrina. One key aspect of the plan, as was posted on the state website, was the use of buses to transport people out of the city, upon the declaration of a state of emergency by the governor.⁸⁵ Furthermore, the New Orleans plan stated “[t]ransportation will be provided to those persons requiring public transportation from the area.”⁸⁶ This plan made it to where the Regional Transit Authority, the New Orleans bus system, would be the lead for this operation.⁸⁷

Another aspect of the plan was a program that Mayor Nagin called “Operation Brother Keeper.”⁸⁸ This was a “buddy system” designed in a way that through the faith-based communities, citizens would be encouraged to evacuate or assisted in evacuating.⁸⁹ This was based off the principle “neighbors helping neighbors” and was built around the strong community structures found in New Orleans.⁹⁰

While the plan to evacuate citizens using buses was sufficient in theory, there were many aspects of it in reality that were either impractical or poorly executed. One aspect of the plan as previously mentioned, suffered as a result of the late mandatory evacuation declaration. Because of this delay, there were not enough qualified bus drivers left in the city to operate the buses.⁹¹ Another issue that arose with this plan was that even when there were buses available and

⁸⁵ Glasser.

⁸⁶ H.R. Rep. No. 109-377.

⁸⁷ Ibid.

⁸⁸ Statement of C. Ray Nagin.

⁸⁹ Ibid, 21.

⁹⁰ Wolshon, 32.

⁹¹ H.R. Rep. No. 109-377.

citizens that wanted to evacuate on them, it was often difficult for the citizens to know where these buses would be located.⁹² Some citizens even reported after the fact that they never saw a bus in their neighborhood, and for those that did, many of them were elderly or were with someone elderly and unable to walk to the bus.⁹³ This inability to access the buses that were available is a glaring problem in the city's plan that resulted in many not evacuating.

An image that spread rapidly across the news in the days after Katrina was one of school buses parked in a lot and flooded with water, when addressing this in his Senate hearing, Mayor Nagin pointed out that those buses were not under his jurisdiction.⁹⁴ Nagin stated under oath, "Those buses were the School Board buses, and they pretty much coordinated those efforts."⁹⁵ While the mayor cannot be blamed for not utilizing these buses as one, he didn't have the power over them, and two there would not have been any drivers for them regardless, it is unfortunate that the city's plan did not have a way to make use of them for evacuation purposes.

While the issues just mentioned made it difficult for citizens to board buses, there were some people who actually did make it onto a bus. However, this did not guarantee that they would make it out of harm's way. New Orleans City Councilwoman Cynthia Hedge-Morrell said that the original intention to evacuate special needs residents out of the city via buses was changed when it was realized that traffic was heavy and a decision was made by city officials to "send the people on the buses somewhere closer to wait out the storm."⁹⁶ This decision results in tens of thousands of citizens of New Orleans stranded in shelter across the city not only during the storm but for days afterwards. Why this decision was made was bizarre to Chip Johnson,

⁹² Eisenman, S112.

⁹³ Ibid.

⁹⁴ Statement of C. Ray Nagin.

⁹⁵ Ibid.

⁹⁶ Cynthia Hedge-Morrell, interview by Laura Sullivan, *Day to Day*, NPR, September 23, 2005.

chief of emergency operation in Avoyelles Parish, located in central Louisiana. Johnson, after reiterating that the plan called for the buses to leave New Orleans stated, “In Avoyelles alone, there was room for at least 200 or 300 more on Sunday night before the storm, and more shelters could have been opened if necessary.”⁹⁷ This is just one example that goes to show that the decision to shelter instead of evacuate was unnecessary as there were places to take the special needs residents that would have removed them from a flooded city.

Much like the plan to utilize buses for evacuation had many issues that rendered it mostly ineffective, the “Operation Brother Keeper” also had several holes in it. In a follow-up question to the mayors hearing that was mailed to him after the fact, Senator Tom Coburn of Maryland asked the mayor “what oversight was given to whether or not people involved with the “buddy system” were actually able to get people to safety?”⁹⁸ Mayor Nagin gave very brief written answer to this question that indicates very little oversight or thought was actually put into this program. His answer reads “Contacted everyone the night before and dist. [sic] via video.”⁹⁹ The Senator also asked if there was any training done prior to Katrina with those who would be implementing this operation but that question goes entirely unanswered by the mayor.¹⁰⁰

For all of the holes in the plan that existed, the greatest issue with New Orleans’ plan for its special needs residents was the fact there wasn’t much of a plan to begin with. In his hearing before the US Senate, Mayor Nagin described the process of trying to workout agreements with different organizations and companies such as “the Regional Transit Authority or the School Board or some paddle-wheel boats”¹⁰¹ to provide transportation out of the city for special needs

⁹⁷ Glasser.

⁹⁸ Statement of C. Ray Nagin.

⁹⁹ Ibid.

¹⁰⁰ Ibid.

¹⁰¹ Statement of C. Ray Nagin.

residents. When asked by Senator Joe Lieberman of Connecticut why these deals didn't get done and these resources were not available,¹⁰² Nagin replies "Well, I think, you know, putting together those types of agreements, you know, are a little complex in our particular area."¹⁰³ This response shows the incompetence of the mayor, of course these agreements are complex, that is why they have been given to the highest and most powerful person in the city. If Mayor Nagin was not going to be able to make them work than who else would be able to? Clearly, as is evidenced by these statements there was no significant plan in place and what plan was in place did not have the resources needed to be properly executed. Nagin stated in reference to working on transportation agreements, "We were trying to make sure the we had every tool available in our tool box [sic] that we felt we needed in the event of an emergency."¹⁰⁴ Unfortunately though for the special needs citizens of New Orleans, the mayor's toolbox was empty.

Although the city only had the basics of an evacuation plan for their special needs residents, had a few things been done differently drastically different results may have been observed. Had the city not reversed their original plan, and instead bused their residents to shelters outside of the city, there would have been significantly less suffering in overcrowded, hot, and underequipped shelters in the city, surrounded by toxic floodwaters, and more people in proper shelters outside of the flood zone. Furthermore, had the mandatory evacuation been delivered sooner, it would have been easier to get residents onto the buses and get those buses out of New Orleans. A longer amount of time to prepare for an evacuation would have helped

¹⁰² Ibid, 27.

¹⁰³ Ibid.

¹⁰⁴ Ibid.

people, both special needs citizens, and officials sort out the logistics of evacuating and would have most certainly seen more people leave New Orleans.¹⁰⁵

One final thing, although there are certainly more, that begs mentioning is the fact that officials did not take Amtrak up on their offer to move special needs residents out of New Orleans.¹⁰⁶ According to Amtrak, they ran a train out of New Orleans on Saturday night at 8:30 carrying equipment to safety, they offered the city the option of placing hundreds of citizens on this train bound for high ground in Mississippi.¹⁰⁷ However, city officials declined this option and the train left with only the extra equipment onboard.¹⁰⁸ Mayor Nagin in his Senate testimony had a different recollection of an offer from Amtrak. He remembered the company offering to take individuals to Hammond, Louisiana which was approximately 60 miles outside of New Orleans. However, the mayor felt that that was not far enough away and “wouldn’t be sufficient for evacuation purposes.”¹⁰⁹ If the mayor is correct and this is the offer that Amtrak made, it is still hard to imagine why being 60 miles outside of the city was not better than being left in the middle of New Orleans. No matter which side is telling the truth, and it is possible that both of them are, it is incomprehensible that the mayor would not have allowed Amtrak to take at least some of his citizens to a safer location further inland. For some people 60 miles could have made the difference between life and death.

New Orleans’ special needs citizens were the most vulnerable during Hurricane Katrina. They had no way to evacuate the city on their own and due to multiple failures by the city officials in New Orleans, and Mayor Nagin himself, they had no way to evacuate at all. With a

¹⁰⁵ H.R. Rep. No. 109-377.

¹⁰⁶ See: Glasser., and statement of C. Ray Nagin.

¹⁰⁷ Glasser.

¹⁰⁸ Ibid.

¹⁰⁹ Statement of C. Ray Nagin.

large population of special needs citizens, caring for and evacuating them should have been a top priority of the city. While certain plans were in place, they were mostly ineffective and few. The residents of New Orleans suffered a great tragedy due to a lack of planning and caring for the citizens who needed it most.

What Went Right

Although the evacuation process in New Orleans prior to Hurricane Katrina appeared to be and was a disaster, not everything about it was bad, there were a few things that did city did well and should be reflected on as a positive lesson to take away. The top success in the evacuation was the use of contraflow. Contraflow is where the inbound lanes of an interstate or highway are reversed to become outbound lanes. For example, if contraflow is enacted on an



Figure 6

eight-lane interstate, there would be eight outbound lanes as opposed to four inbound and four outbound.¹¹⁰ While average travel speeds of 12mph may sound extremely slow, this was much better than past experiences, when cars sat at a standstill for

¹¹¹ hours on end.¹¹² In a 1994 study related to evacuation clearance times, the projected amount of time it would take to empty New Orleans was anywhere between 44 and 50 hours based on the theory that a little over 400,000 cars would

¹¹⁰ Boyd, 450-452.

¹¹¹ Here is an example of the temporary onramp in a contraflow situation. The outbound lane provides a way to merge over into the usual inbound lane and use it as an outbound lane. Photograph from the public domain.

¹¹² Jane Moller, "Revised contraflow starts off smoothly," *Times-Picayune* (New Orleans, LA), Aug. 28, 2005.

be involved.¹¹³ When the evacuation ahead of Katrina took place in 2005, it lasted somewhere between 36 and 38 hours with the estimated vehicle count somewhere around 430,000.¹¹⁴

A resident who first evacuated New Orleans ahead of Hurricane Katrina and then Houston ahead of Hurricane Rita, reflected on the difference in the two evacuations. The success of the New Orleans contraflow is highlighted in the quote, “Our evacuation from Katrina was almost flawless. We left at midday Saturday, Aug. 27, about 40 before the storm made landfall. We made it in eight hours.”¹¹⁵ On the other hand the troubles of the Rita evacuation are shown when the same person writes, “It should have been a six-hour drive... for the next 10 hours, we crept along at 1 mph.”¹¹⁶ This goes to show that in all of its chaos and catastrophe, New Orleans did the contraflow evacuation right, a large number of people were able to evacuate in a timely fashion. One thing however that is important to remember about contraflow, is that it only benefits a certain demographic of people. Contraflow no matter how successful cannot benefit those without cars, or the financial means to evacuate themselves out of the city. Contraflow only benefits those people if the city places them on a bus and drives them out of the city. This is the reason that for all of the successes of the contraflow evacuation, it was still insufficient, it did not allow for everyone to evacuate.

One other success that can be drawn from the Hurricane Katrina evacuation was the use of staged evacuations. A staged evacuation is when the evacuation begins with those closest to the ocean leaving first and the communities further inland following suit soon afterwards. This allows the most vulnerable groups and groups with the farthest distances to cover to get the

¹¹³ Boyd, 452.

¹¹⁴ Ibid.

¹¹⁵ Autumn Giusti, “Louisiana contraflow plan an example for the nation,” *New Orleans Citybusiness*, Aug. 28, 2006.

¹¹⁶ Ibid.

earliest start and helps to prevent congestion on the evacuation route.¹¹⁷ This process did see some success prior to Katrina but much like contraflow, only benefits those with the means to evacuate themselves, and is of no benefit to special needs residents.

Staged evacuations and contraflow are two positives that should be remembered from Hurricane Katrina. These are examples that show not every action the City Government and Mayor Nagin took had a negative impact on the ability of New Orleans residents to get out of the city. These, unlike most aspects of the evacuation should be studied as a positive and reused by other city governments facing a destructive hurricane. One example of this in action was when in 2016, in order to evacuate ahead of Hurricane Matthew, all lanes of Interstate 26 in South Carolina were shifted to outbound from Charleston to Columbia. This proved to be effective in moving the residents of those coastal communities to safety. However, as these procedures are praised, it is important to remember that in order for an evacuation to be fully effective, all citizens of a city must have the opportunity to flee to safety, not just those with their own source of transportation.

Was There a Warning?

One important question that must be answered when attempting to determine whether or Mayor Nagin is culpable for the poor evacuation process prior to Katrina is whether or not he had any reason to believe that a storm like Katrina could happen and that it could flood the city. Had the mayor not had any reason to believe that Katrina was possible then a lack of planning and preparation would be understandable, although still slightly concerning. However, if it can be shown that the mayor had reason to believe that a storm like Katrina was possible and that

¹¹⁷ See: Glasser., Wolshon, 33.

flooding like what occurred was also possible then much of the blame for the tragedy of Katrina must rest on his shoulders. There were signs that Katrina was coming and evidence that New Orleans would flood, they were clear enough to cause panic in some people, unfortunately though, not the right people.

New Orleans as a city has from its beginning has had a difficult history with its location. Founded in 1718 in a crescent of the Mississippi river, New Orleans was in a perfect location to conduct business, just not to stay dry.¹¹⁸ Due to the historical flooding of the Mississippi River, and the sediment that it deposited, the highest ground in New Orleans is along the bank of the river.¹¹⁹ When in the city, it is interesting to observe that in order to get to the riverfront one must walk uphill, a phenomenon quite contrary to typical geography. As the city moves away from the Mississippi, it descends downward until reaching its lowest point near the middle of the city, about 15 feet below the river. On the other side of New Orleans is found Lake Pontchartrain, a shallow but wide estuary with a connection to the Gulf of Mexico.¹²⁰ With water on all sides and its lowest point in the middle, the topography of New Orleans causes it to seem like a bowl floating in the ocean. One wave that is too high and the entire thing will be filled with water, with no way out.

The fact that the land that is closest to the lake used to be a swamp does not make matters any better. Not only is this area of New Orleans low in elevation but it is naturally soggy and prone to flooding.¹²¹ Further making this worse, New Orleans receives on average, 60 inches of rain per year. All of these factors lead to a city that does not drain properly and is highly prone

¹¹⁸ Ari Kelman, "Boundary Issues: Clarifying New Orleans's Murky Edges," *Journal of American History* 94, (2007): 695-703.

¹¹⁹ Ibid.

¹²⁰ Ibid.

¹²¹ Ibid.

to flooding. This issue was first realized in 1719 when the city flooded and efforts began to make New Orleans a drier place to live.¹²² The first levee was completed in 1727 but did not do much to stop the flooding with major floods occurring three more times in the Eighteenth Century.¹²³ Ever since that first levee in 1727, the city of New Orleans has continued to build barriers around itself to keep the flood waters out. As one travels around the city today, it is hard to miss the grassy hills and concrete walls that form the perimeter and line the countless canals. These constructs of man have been designed to keep New Orleans dry, further proof that major flooding is just around the corner.

The last major flood in New Orleans prior to Katrina, came as a result of Hurricane Betsy in 1965.¹²⁴ This storm while not as disastrous as Katrina was nicknamed “Billion Dollar Betsy” due to the fact its damages totaled an astonishing \$1 billion in 1965. Much like Katrina, Betsy’s storm surge overtopped and breached the city’s levees and flooded much of New Orleans, especially the lowest areas such as the 9th ward. Unfortunately, one significant result of the improvements that were attempted in the wake of Betsy was the accidental segregation of the city.¹²⁵ New Orleans much as a result of its small area, had throughout history been known as a highly integrated city with people of all colors, financial statuses, and cultural backgrounds living side-by-side.¹²⁶

With what were thought of as improvements to the city, the area in which people lived was able to expand. New Orleans developed suburbs and much like in most American cities the more financially stable and often white residents left the city for these newly developed

¹²² Ibid.

¹²³ Ibid.

¹²⁴ Ibid.

¹²⁵ Ibid.

¹²⁶ Ibid.

suburbs.¹²⁷ Unlike most other American cities however, the older parts of the city typically sat at a much lower elevation than these new suburbs. Those that moved out, had, whether intentionally or not, fled to higher ground, leaving their former neighbors in the flood-zone. This phenomenon resulted in those with the least ability to evacuate from Katrina in the location where evacuation was most needed. Many of those who were able to evacuate lived in a location where the need to was not as severe. This resulted in the fact that many of those who lost their lives in Katrina were poor, African-American, and many times both.

The city's history of flooding and the resulting segregation of New Orleans should have been enough to cause city officials to have on file a highly detailed and structured evacuation plan. Any mayor who knew their city like a mayor should, would have known of the city's history of flooding and the fact that many without the ability to evacuate were in the most vulnerable locations.

Not only did New Orleans have a history of storms and flooding that should have caused city officials concern, there was also concern from the scientific community that showed the threat of a Katrina-like storm was very clear. Ivor van Heerden, a hurricane expert at Louisiana State University sat down with PBS in October of 2004, a little less than a year before Hurricane Katrina to discuss the possibility of a storm like what Katrina turned out to be. When asked how he would describe the city and its wetlands if they were a patient in the hospital, van Heerden said "close to death".¹²⁸ van Heerden is asked by the interviewer to describe New Orleans' worst case scenario and the results of it.¹²⁹ He says that in the event of a slow-moving Category 3, the city would be flooded with toxic waters from the storm surge in Lake Pontchartrain, reaching

¹²⁷ Ibid.

¹²⁸ Ivor van Heerden, interview by Joe McMaster, *NOVA*, Public Broadcasting Service, October 29, 2009.

¹²⁹ Ibid.

depths as high as the average home's roof. He also predicted that approximately 300,000 people would be left in the city, and would have to scramble to higher ground as the floodwaters rose just to survive.¹³⁰ While he overestimated the number of citizens left in the city, with the actual number between 70,000 – 100,000, he cannot be faulted for not showing enough concern.

Furthermore, van Heerden very accurately predicted what would happen in relation to the flooding. He was correct in the statement that the hurricane's winds would destroy property resulting in a release of toxins into the water which would then mix with the surge from Lake Pontchartrain. The prediction that water would reach up to the roofs of the average home and that people would have to scramble to high ground for survival proved to be shockingly accurate as these images are seared into the memory of all who observed the effects of Katrina.

When asked what the probability was of a hurricane making landfall in New Orleans and wreaking the kind of havoc that van Heerden was predicting, he stated "If we look in the last eight years, we have two near misses of New Orleans. And as the wetlands fall apart, the potential of these hurricanes to do major destruction through storm surges rises and rises and rises. So every year that goes by the probability of this killer storm occurring increases."¹³¹ And while he didn't make the claim that this kind of a storm would happen within the year, like it actually did, he did state "once every seven to eight years we're going to have a near miss."¹³² It was clear that this man who had dedicated himself to hurricanes and specifically ones that affect Louisiana, was concerned about New Orleans, unfortunately not everyone shared in his concern.

¹³⁰ Ibid.

¹³¹ Ibid.

¹³² Ibid.

This, much like the letter detailed earlier, is an example of someone who knew that a storm like Katrina could take place and that the city was not prepared for it to happen. They both expressed their concerns through different mediums but unfortunately for the citizens of New Orleans, were disregarded. Why the city did not listen to either one of these experts is a mystery in itself but it most certainly is a combination of things. Many in New Orleans had the feeling the big one would never come, and for this reason didn't want to spend the money preparing for a phantom storm. The city government and Mayor Nagin apparently did not want to invest the time and money into these issues¹³³, much for the same reason the delay in the evacuation occurred, if a storm never struck, it would be money wasted.

One other thing that has been mentioned in a separate context, that should have alerted the city to the threat of a storm like Katrina turned out to be was the Hurricane Pam exercise. During the exercise, scientists from LSU stated that a storm of that magnitude would overtop and breach the levees, leading to the flooding of much of the city.¹³⁴ Furthermore, this exercise was designed because of New Orleans' vulnerability to hurricanes, however the officials who took part in that exercise did not seem to believe that a hurricane of that magnitude and direction would actually hit the city.¹³⁵ This is hard to imagine because if it were not for the potential of a major hurricane, then Hurricane Pam would have never been executed in the first place. And to dismiss a hurricane expert when he or she expresses concern that levees will be breached shows a total disregard for science and expertise, a disregard that cost many their lives.

¹³³ Statement of C. Ray Nagin.

¹³⁴ Ivor van Heerden.

¹³⁵ Ibid.

Conclusion

In conclusion, it is important to reemphasize the point that Hurricane Katrina was unavoidable, the human suffering and death that occurred on the other hand was not. There were many different mistakes that were made before, during, and after the storm that, had they never happened, the suffering would have been lessened. The purpose of this investigation however was to examine the evacuation process and whether or not it was a failure. The finding of this research is that it was a failure of catastrophic proportions that cost many people their lives.

One major failure of the evacuation was Mayor Nagin's inability to call for a mandatory evacuation in a timely fashion. It was proved through many different studies and programs that the evacuation should have been declared much sooner than it was, and had it been, it would have made a difference. Why this delay occurred can only be explained by the mayor's own words. He expressed the concern that the city and his office would be liable for any lost revenue by private businesses should the storm bypass New Orleans. The mayor was concerned that if the storm did not strike his city, people would be upset that he had interrupted their weekend and forced them into spending money on an evacuation. It became obvious through this investigation that the mayor was more concerned about saving his own skin, than the lives of his citizens.

This delay had a tremendous and unfortunate impact, many people did not take Hurricane Katrina as seriously as they should have, because the evacuation was not mandatory, and once it was declared a mandatory evacuation, the time allowed to leave was for too short for many residents. This resulted in many people staying in the city that would have otherwise gotten out. This hesitation cannot be duplicated in any other city in the future, the consequences as have

been seen are too drastic, no government official should gamble with the lives of their citizens, regardless the cost.

The messaging associated with the Hurricane Katrina evacuation was also investigated for its flaws. Without sufficient distribution of information, the decisions made by Mayor Nagin would not matter. It became clear through the research that the private entities involved in carrying the message of Hurricane Katrina should be applauded for the job they did. *The Times-Picayune* daily carried information on the storm, often including maps and projections provided by scientists at Louisiana State University, another group of people who deserve applause for their efforts in educating the public to Katrina's dangers.

While the city and Mayor Nagin had many procedures in place, some of which were unique and creative, to disperse the information regarding Katrina, many of them had fatal flaws. The use of ministers to spread the message was creative and especially tailored to the culture of New Orleans, unfortunately without the backing of a mandatory evacuation this tactic was not as successful as it could have been. The use of the NOPD to spread the message suffered a similar fate, it was a good idea, but without a mandatory evacuation it did not work as well as it could have. These examples get at the reason the messaging was mostly ineffective. It was not because there wasn't enough of it, that part was adequate, it was a result of a lack of strong and forceful language from the Mayor. Had a mandatory evacuation been issued sooner, the messaging would have been much more effective. This unfortunately resulted in many not taking the warnings seriously and remaining in harm's way.

The special needs population in New Orleans was quite possibly the greatest victim of the failures of the evacuation process. Not only did these people not have the means to evacuate themselves, the city did not adequately provide means for them. The city had a plan in place to

evacuate those who could not evacuate themselves but did not fully implement it for several reasons. One main reason was that due to the delayed mandatory evacuation, the resources needed to carry out an evacuation of needy residents, were not available. Furthermore, poor decision making on the part of city officials resulted in those who were able to get onto buses being taken only to shelters and not out of the city. In all of the research conducted, no reasonable explanation can be found to answer why this decision was made. There were clearly buses for these people yet they were only shuttled to locations still in New Orleans.

It was one of the greatest responsibilities of New Orleans and Mayor Nagin to see that the special needs population was cared for. Much like the other problems in Hurricane Katrina's evacuation process, the failure to take care of these people can be traced back to the delay in calling for the mandatory evacuation. Had it been called for sooner, the city's plan could have been better implemented and more residents would have lived through the storm.

In all of the failures of the evacuation process, it is important to reserve a space to recognize the things that went well. There were two things New Orleans did that other cities would be wise to copy if found in a similar situation. Contraflow was one of these successes, it allowed for an astonishing amount of people to evacuate the city and do so in a significantly quicker time than previously thought possible. The staged evacuation also should be counted as a positive, as it was a creative way to evacuate the most vulnerable people first and prevent congestion on the roadways. While it is important to celebrate these positives, it is also equally important to remember that they were only positive for individuals with a way to evacuate themselves, and did nothing to help those who did not.

One question that must be answered before anyone in the New Orleans Government can be blamed for the poor and incomplete evacuation is, did they know that a storm like Katrina

could happen and should they have been better prepared? The answer to both of these questions, based on research is a definitive yes. The history of New Orleans is riddled with instances of flooding and construction of levees to keep the water out. This alone should be enough to cause concern and officials to take no risk in the event of a hurricane. However, this was not enough nor was the recent memory of flooding caused by Hurricane Betsy. And while city officials including the mayor, rejected the warnings of danger, experts did not. The threat to New Orleans was clear to some, unfortunately they were the ones who could make a difference.

This disregard for history and evidence that New Orleans was not in a safe state of being caused there to be an insufficient amount of planning for an event like Hurricane Katrina, and a lackadaisical attitude towards the storm when it pointed towards the city. This led to a failure in fully evacuating New Orleans' residents and unnecessary death and suffering.

The tragedy of Hurricane Katrina in New Orleans was avoidable. The greatest difference would have been made if Mayor Nagin had called for the mandatory evacuation sooner. However, he did not and should be considered responsible for the disaster that unfolded in his city. The lack of an earlier mandatory evacuation meant that for all of the reasons previously mentioned, New Orleans was far from empty when Katrina struck. The goal of an evacuation should be to have an empty city when the hurricane makes landfall. While blame must be placed on individual citizens who were able to evacuate and for various reasons chose not to, these people were in the minority of those left in the city. Because of the failures of Mayor Nagin and others in the City Government, many never had the chance to evacuate New Orleans and these failures cost them their lives.¹³⁶

¹³⁶ As of the time of the completion of this investigation, former Mayor Nagin is serving a ten-year sentence in federal prison. While the crimes are not directly related to Hurricane Katrina, they do revolve around bribes he took

from contractors who were working on the city's rebuilding after the storm. This information was not mentioned in this work because it is not relevant to the evacuation process. However, it would be a failure of fact to omit this detail entirely.