

# City of Gretna Repetitive Loss Area Analysis



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*Adopted by Council August 8, 2018*

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## INTRODUCTION

In the United States, flooding is the most common natural disaster; resulting in more loss of life and property than any other types of hazards and severe weather events. More than 20,000 communities experience floods and this hazard accounts for approximately 73 percent of all Presidential Disaster Declarations over the 2008-2017 time period.<sup>1</sup> Recent studies also indicate how the cost of recovery is spread over local, state and federal government and the disaster victims who are themselves affected by the disaster.

Statistics indicate that there are thousands of NFIP's policyholders whose properties have flooded multiple times. "Repetitive Loss properties," are buildings and/or contents for which the NFIP has paid at least two claims of more than \$1,000 in any 10-year period since 1978.<sup>2</sup> Severe Repetitive Loss property (SRL) is four or more separate claim payments of more than \$5,000 each (including building and contents payments); or two or more separate claim payments (building payments only) where the total of the payments exceeds the current value of the property. In this Repetitive Loss Area Analysis (RLAA), flooding issues and potential mitigation measures are discussed for homes located in the City of Gretna's Repetitive Loss Areas referred to as Area 1 and Area 2. These areas have experienced repetitive flooding and were chosen based on the nature of flooding, type of structure and the number of flood insurance claims made. The residents have continually undergone personal losses and stresses associated with living in a flood-prone house. To form appropriate and effective recommendations, this report has been created in collaboration with the residents of Area 1 and Area 2.

It is anticipated that informed residents can become stronger advocates for policy change at the neighborhood, city, parish, state and even federal levels. This report is therefore an attempt to help homeowners reduce their flood risk by being aware of the flooding problems in their neighborhood, and the potential solutions to the continual suffering that results from repetitive flooding. Finally, mitigation of these repetitive loss properties will ultimately be instrumental in reducing the overall costs to the NFIP as well as to individual homeowners.

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<sup>1</sup> Federal Emergency Management Agency, "Protecting Homes," last updated June 24, 2016, <http://www.fema.gov/protecting-homes>

<sup>2</sup> Federal Emergency Management Agency, National Flood Insurance Program Flood Insurance Manual (April 2016), <http://www.fema.gov/media-library/assets/documents/115549>.



## BACKGROUND

The National Flood Insurance Program (NFIP), a program overseen by the Federal Emergency Management (FEMA), is continually faced with the task of paying claims while trying to keep the price of flood insurance at an affordable rate since 1968. There are approximately 5.3 million NFIP policies across the United States in more than 22,000 communities. As of 2009, repetitive loss properties represent only one (1) percent of all flood insurance policies, yet historically they account for nearly one-third (1/3) of the claim payments. While the NFIP has resulted in forty years of successful floodplain management, repetitive loss properties still remain a drain on the NFIP.<sup>3</sup> The City of Gretna, located in Louisiana (CID-225198), participates in the NFIP. In addition to meeting the basic requirements of the NFIP, Gretna has completed additional components to participate in the Community Rating System (CRS) program. Gretna is currently a CRS Class 8 which rewards all policyholders in the SFHA with a 10 percent reduction in their flood insurance premiums. Non-SFHA policies (Standard X Zone policies) receive a 10% discount, and preferred risk policies receive no discount. The City of Gretna has been participating in the CRS program since October 1, 2000.

As of March 31, 2018, there are 3,115 NFIP policies in force in the City of Gretna and insurance coverage of approximately \$776 million.



A repetitive loss property does not have to have a current flood insurance policy to be considered a repetitive loss property or a severe repetitive loss property. In some cases, a community will find that properties on its repetitive loss list are not currently insured. Once it is designated as a repetitive loss

property, that property remains a repetitive loss property from owner to owner; insured policy to no policy; and even after that property has been mitigated. Almost forty-one percent of all structures having policies in Gretna are currently insured. According to repetitive loss data received from NFIP Repetitive Loss (RL) AW-501 Worksheets, there are a total of 276 unmitigated and over 219 mitigated repetitive loss properties within the City of Gretna.

### Terminology

**Area Analysis:** An approach to identify repetitive loss areas, evaluate mitigation approaches, and determine the most appropriate alternatives to reduce future repetitive losses

**Hazard Mitigation:** Defined by FEMA as sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event

**Repetitive Loss:** Any insurable building for which two or more claims of more than 1,000 have been paid within a 10-year period, since 1978. To focus resources on those properties that represent the best opportunities for mitigation, a subcategory of Severe Repetitive Loss Properties is listed.

**Severe Repetitive Loss:** As defined by the Flood Insurance Reform Act of 2004, SRLs are 1-4 family residences that have had four or more claims of more than \$5,000 or at least two claims that cumulatively exceed the building's value. The Act creates new funding mechanisms to help mitigate flood damage for these properties.

<sup>3</sup> Federal Emergency Management Agency, "Federal Flood Risk Management Standard," last updated March 29, 2016, <http://www.fema.gov/news-release/2015/02/05/federal-flood-risk-management-standard>



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A Multijurisdictional Floodplain Mitigation Plan (FMP) for Jefferson Parish was updated in 2015. Since the FMP examines flooding issues as a whole within the Parish and does not assess individual properties, the City of Gretna has opted to complete a Repetitive Loss Area Analysis (RLAA) using the 2017 CRS Coordinator's Manual. The RLAA will benefit the city by examining potential mitigation measures for its Repetitive Loss Areas 1 and 2 and increasing its credit in the CRS Program.

## COMMUNITY RATING SYSTEM

The Community Rating System (CRS) is a voluntary program designed to reward a community for doing more than meeting the NFIP minimum requirements to reduce flood damages. Communities can be rewarded for activities such as reducing flood damage to existing buildings, managing development in areas not shown in the floodplain on the Flood Insurance Rate Map (FIRM), protecting new buildings from floods greater than the 100-year flood, helping insurance agents obtain flood data, and helping people obtain flood insurance. The reward for these activities comes in the form of reduced premiums for flood insurance policy holders. Once a community has been accepted into the CRS, the community's floodplain management activities are rated according to the scoring system described in the CRS Coordinator's Manual. CRS communities are rated on a scale of 1-10. A Class 10 community receives no reduction in flood insurance premiums, but every class above 10 receives an additional 5% premium reduction. Class 1 requires the most credit points and provides a 45% premium reduction.



## THE AREA

The City of Gretna is an incorporated municipality located within Jefferson Parish in southeastern Louisiana. The parish is bordered by Lake Pontchartrain on the north, Orleans and Plaquemines Parish to the east, Gulf of Mexico to the south, and Lafourche and St. Charles Parishes to the west. See Figure.1-1 below.



Figure 1-1

Principal physiographic features of the area are the Mississippi River channel, natural levee ridges along its banks and along the banks of abandoned distributary channels, and low marshlands situated between and bordering the channels. Jefferson Parish is divided into an East and West Bank by the Mississippi River which meanders through the northern section of the Parish. The highest land in the Parish is approximately 10 feet above the North American Vertical Datum (NAVD) along the natural levee that borders the Mississippi River. The East Bank is nearly surrounded by water and bound by the Mississippi River to the south, Lake Pontchartrain to the north, the 17th Street Canal to the east, and St. Charles Parish to the west. The West Bank of Jefferson Parish, east of the Harvey canal, is bound by the Donner Canal to the east, the Mississippi River to the north, the Harvey Canal to the west, and the Intracoastal Waterway to the south.

With a total population of 432,552 as of the 2010 census, Jefferson Parish is spread over a total land area of 305 square miles or 195,793 acres and a water area of 336 miles or 215,358 acres.<sup>4</sup> The Parish extends about 55 miles in a north-south direction from the southern shores of Lake Pontchartrain to the Gulf of Mexico. The southern part of the parish is less populated and is characterized by estuarine systems that lead in from the Gulf of Mexico. The coastal marshes, wetlands, and estuaries contain numerous bodies of shallow water. These bodies of water and wetlands make up over 85 percent of the parish.

The City of Gretna is a community of approximately 18,000 residents directly across the Mississippi River from Downtown New Orleans. The City was first settled in the early 19<sup>th</sup> century and expanded considerably during the latter half of the 20<sup>th</sup> century. Development patterns are reflective of many American Cities, with a historic core and more recent outward suburban expansion. The City is approximately four (4) square miles bound by the Mississippi River to the north, extending southward – in a gradual decent off of the natural levee - into the South Louisiana coastal plain. The entirety of the City is within the Hurricane and Storm Damage Risk Reduction System (HSDRRS), relying on gravity fed stormwater management networks which feed into Jefferson Parish managed outfall canals and pump stations.

Hundreds of floods occur each year in the United States, including overbank flooding of rivers and streams and shoreline inundation along lakes and coasts. Given the geographic location and physiographic nature of Gretna, flooding in the area typically results from large-scale weather systems generating prolonged rainfall due to hurricanes, thunderstorms (convective and frontal) or winter storms. According to the

<sup>4</sup> <https://www.census.gov/quickfacts/fact/table/jeffersonparishlouisiana/PST120216>, accessed 3/28/2018



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Floodplain Hazard Mitigation Plan (FMP) there have been 4 floods recorded in Gretna in the period from 1998 to 2014. The history of flooding in Gretna indicates that flooding may occur during any season of the year. In the cooler months, the area is subject to heavy rainfalls resulting from frontal passages. In the summer months, heavy rainfalls result from convective thunderstorms. In the late summer, hurricanes accompanied by rainfall and super-elevated water-surface elevations pose the largest threat of flooding to the area. With an average annual precipitation of 64.16 inches, flood protection is vital to Jefferson Parish and the City of Gretna<sup>5</sup>.

Flood protection in northern Jefferson Parish is achieved by a system of levees, floodwalls, canals and drainage pump stations. The parish has 340 miles of canal waterways, drainage ditches, cross drains, culverts, and internal levee systems. There are also 70 pump stations (24 major stations) that include 167 pumps installed throughout the parish drainage system for a total capacity of 47,569 cfs.<sup>6</sup> With the exception of some areas inside the levee protected areas of northern Jefferson Parish, most of the land is located within FEMA's 100-year floodplain. The land area outside of the 100-year floodplain may still be subject to flooding if a levee failure were to occur. Figure 1-2 on the next page illustrates drainage on the West Bank of Jefferson Parish along with the main canals and other water features.

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<sup>5</sup> Jefferson Parish, October 2015: Jefferson United Mitigation Professionals Multijurisdictional Program for Public Information.

<sup>6</sup> Jefferson Parish Drainage Department





Figure 1-2





## REPETITIVE LOSS REQUIREMENT

Repetitive loss data must be maintained and updated annually in order to participate in the CRS. Since many of the losses under the NFIP come from repetitively flooded properties, addressing these properties is a priority for participating in the CRS Program. Depending on the severity of the repetitive loss problem, a CRS community has different responsibilities.

- **Category A:** A community with no unmitigated repetitive loss properties. No special requirements from the CRS.
- **Category B:** A community with at least one, but fewer than 10, unmitigated repetitive loss properties. Category B communities are required by the CRS to research and describe their repetitive loss problem, create a map showing the location of all repetitive loss areas and complete an annual outreach activity directed to repetitive loss properties.
- **Category C:** A community with 50 or more unmitigated repetitive loss properties. Category C communities are required to do everything in Category B and prepare either a floodplain management plan that covers all repetitive loss areas or prepare a RLAA for all repetitive loss areas.

As of 2018, the City of Gretna has a total of 276 unmitigated Repetitive Loss and Severe Repetitive Loss properties. The City of Gretna is, therefore, designated as a Category C repetitive loss community.

## MAPPING REPETITIVE LOSS AREAS

In accordance with the principles outlined in the CRS guidance titled Mapping Repetitive Loss Areas dated October, 2015, two (2) repetitive loss areas were identified within the City of Gretna. There are total 276 unmitigated repetitive loss properties in the City of Gretna.

This RLLA consists of repetitive loss properties and the surrounding properties that experience the same or similar flooding conditions, whether or not the buildings on those surrounding properties have been damaged by flooding. The methodology adopted to select the areas are as follows:

- Total number of flood insurance claims post Hurricane Katrina;
- Percentage of repetitive flood loss properties as compared to the structures, between October 2005 and June 2017; and
- Cluster of repetitive flood loss properties in the neighborhood.

Based on the data analysis, the areas illustrated in Figure 1-3 were selected for the RLAA.



## REPETITIVE LOSS AREA 1 AND 2

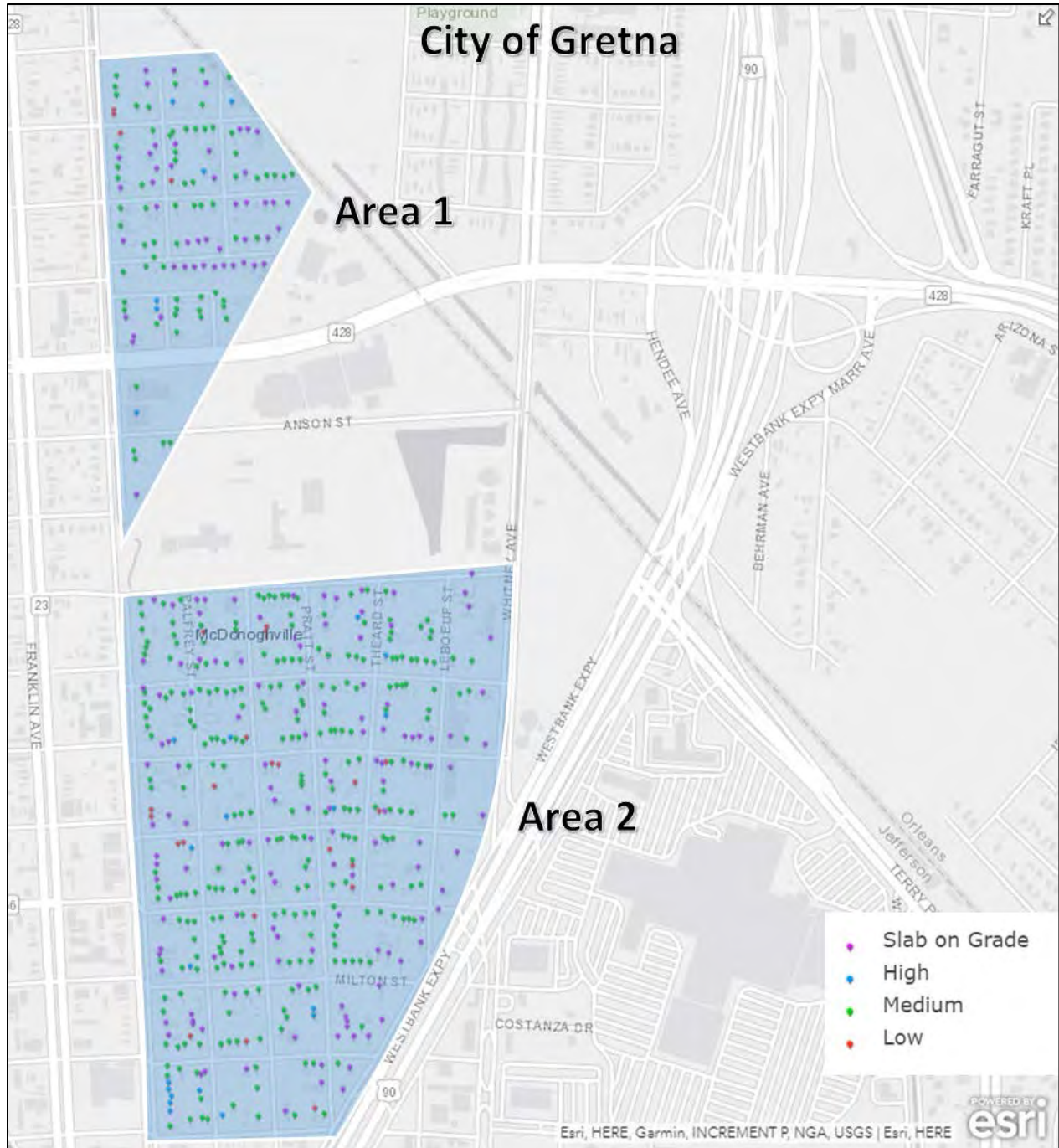


Figure 1-3- Outline of Areas 1 and 2



## THE RLAA PROCESS

The RLAA planning process incorporated requirements from Section 510 of the 2017 CRS Coordinator's Manual. The planning process also incorporated requirements from the following guidance documents: 1) FEMA publication Reducing Damage from Localized Flooding: A Guide for Communities, Part III Chapter 7; 2) CRS publication Mapping Repetitive Loss Areas dated October, 2015; and 3) Center for Hazards Assessment Response and Technology, University of New Orleans draft publication The Guidebook to Conducting Repetitive Loss Area Analyses. Most specifically, this RLAA included all five planning steps included in the 2017 CRS Coordinator's Manual:

**Step 1. Advise** all the properties in the repetitive loss areas that the analysis will be conducted and request their input on the hazard and recommended actions.

**Step 2. Contact** agencies and organizations that may have plans or studies that could affect the cause or impacts of the flooding. The agencies and organizations must be identified in the analysis report.

**Step 3. Visit** each building and collect basic data.

**Step 4. Review** alternative approaches and determine whether any property protection measures or drainage improvements are feasible.

**Step 5. Document** the findings. A separate analysis report must be prepared for each area.

Beyond the 5 planning steps, additional credit criteria must be met:

1. The community must have at least one repetitive loss area delineated in accordance with the criteria in Section 503 of the 2017 CRS Coordinator's Manual.
2. The repetitive loss area must be mapped as described in Section 503.b. A Category "C" community must prepare analyses for all of its repetitive loss areas if it wants to use RLAA to meet its repetitive loss planning prerequisite.
3. The repetitive loss area analysis report(s) must be submitted to the community's governing body and made available to the media and the public. The complete repetitive loss area analysis report(s) must be adopted by the community's governing body or by an office that has been delegated approval authority by the community's governing body.
4. The community must prepare an annual progress report for its area analysis.
5. The community must update its repetitive loss area analyses in time for each CRS cycle verification visit.



## STEP 1. ADVISE ALL PROPERTY OWNERS

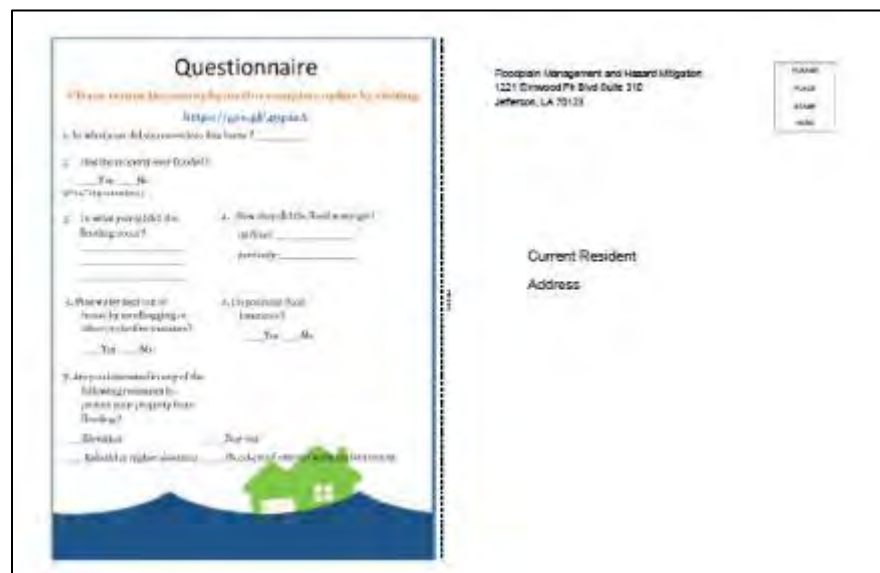
Before field work began on the RLAA, individual notices were mailed to property owners within the 2 identified Repetitive Loss Areas. The notices advised properties owners about the analysis and requested their input on the flooding problem in their area and mitigation actions taken. The notice also advised property owners how they could provide comments on the draft report once it was posted online. Property owners could fill out the questionnaire postcard that was mailed to them and send it back in via USPS, or they could take an online survey with a link that was provided on the mailer.

The property owner notice with questionnaire was mailed to 634 residents in Areas 1 and 2 the week of April 27, 2018.

Figure 1- 4 Front of Notice



Figure 1- 5 Back of Notice with Questionnaire





**GRETNA**

Out of the 634 mailed questionnaires, Jefferson Parish received three responses which corresponds to a response rate of less than 1 percent. Questionnaire responses are summarized below. Note: respondents may have skipped questions and/or provided more than one response to a question. Three addresses were returned as undeliverable.

**Q1: In what year did you move into this home?**

Responses Received	Percentage	Number Responding
<10 years ago	-	None
10-20 years ago	33.3	1
20-30 years ago	-	None
30-40 years ago	33.3	1
40-50 years ago	-	None
> 50 years ago	33.3	1
<b>Total</b>	<b>99.9</b>	<b>3</b>

**Q2: Has the property ever been flooded?**

Answer Choices	Percentage	Number
No	67	2
Yes	33	1
<b>Total</b>	<b>100</b>	<b>3</b>

**Q3: In what year(s) did the flooding occur?**

Responses Received	Percentage	Number Responding
Unanswered/NA	100	3
<b>Total</b>	<b>100</b>	<b>3</b>



**Q4: How deep did the water get?**

Answer Choices	Percentage	Number Responding	Depth	
			< 3 ft	> 3 ft
First floor	-	None	-	-
Yard only	-	None	-	-
Unanswered/NA	100	3	-	-
<b>Total</b>	<b>100</b>	<b>3</b>	-	-

**Q5: Was water kept out of the house by sandbagging or other protective measures?**

Answer Choices	Percentage	Number Responding
No	-	None
Yes	-	None
Unanswered/NA	100	3
<b>Total</b>	<b>100</b>	<b>3</b>

**Q6: Do you have Flood Insurance?**

Answer Choices	Percentage	Number Responding
No	67	2
Yes	33	1
<b>Total</b>	<b>100</b>	<b>3</b>

**Q7: Are you interested in any of the following measures to protect your property from flooding?**

Answer Choices (can choose more than one)	Percentage	Number Responding
Elevation	-	None
Buy-out	-	None
Rebuild at higher elevation	33.3	1
Flood-proof exterior walls and entrances	33.3	1
<b>Total</b>	<b>33.3</b>	<b>1</b>



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The following trends in survey responses should be considered when evaluating mitigation measures for Areas 1 and 2:

- One of the three respondents is interested in protecting his or her home/building from flooding by either rebuilding at a higher elevation or floodproofing exterior walls and entrances.
- One of the three respondents currently has FEMA flood insurance.
- All of the respondents have been living in their houses for at 10 years.
- Historically, within Jefferson Parish, the greatest flood events occurred in 1995, 2005 and 2008. The following flood events are detailed in NOAA's National Climatic Data Center (NCDC) database:

- **Southeast Louisiana and Southern Mississippi Flood, 1995** - It was a heavy rainfall event which occurred across an area stretching from the New Orleans metropolitan area into southern Mississippi. A storm total rainfall maximum of 27.5 inches (70 cm) was recorded near Nacaise, Mississippi. Considerable flooding was caused by the rainfall including several record flood crests along impacted river systems. The flooding caused six fatalities and more than \$3.1 billion in damage.
- **August 29, 2005** – The Category 3 Hurricane Katrina caused catastrophic damage along the Gulf coast from central Florida to Texas, much of it due to the storm surge and levee failure. Severe property damage occurred in coastal areas, such as Mississippi beachfront towns where boats and casino barges rammed buildings, pushing cars and houses inland; water reached 6–12 miles (10–19 km) from the beach. The storm was the third most intense United States landfalling tropical cyclone, behind the 1935 Labor Day hurricane and Hurricane Camille in 1969. Overall, at least 1,245 people died in the hurricane and subsequent floods, making it the deadliest United States hurricane since the 1928 Okeechobee hurricane. Total property damage was estimated at \$125 billion (2005 USD), roughly four times the damage wrought by Hurricane Andrew in 1992 in the United States.
- **August-September, 2008** - The storm surge ahead of Ike blew onshore of Louisiana well ahead of Ike's predicted landfall in Texas on September 13. Areas in coastal south-central and southwestern Louisiana, some of which were flooded by Gustav, were re-flooded as a result of Ike. Some areas that had not yet recovered from Gustav power outages received additional outages of 200,000. The hardest-hit areas were in and around Cameron Parish, with nearly every square inch of the coastline in that area was flooded heavily, reaching as far north as Lake Charles, nearly 30 miles inland.





## STEP 2. CONTACT AGENCIES AND ORGANIZATIONS

Jefferson Parish Department of Hazard Mitigation and Floodplain Management contacted external agencies and internal departments that have plans or studies that could affect the cause or impacts of flooding within the identified repetitive loss subareas. The data collected was used to analyze the problems further and to help identify potential solutions and mitigation measures for property owners. The agencies contacted and reports which were analyzed and reviewed are as follows:

### Agencies

- Jefferson Parish Electronic Information System Department
- Jefferson Parish Streets Department
- Jefferson Parish Office of Risk Management
- Jefferson Parish Drainage Department

### Reports

- FEMA – Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for Jefferson Parish, February 2, 2018
- ISO – Repetitive Flood Insurance Claims Data
- Jefferson Parish Hazard Mitigation Plan

## SUMMARY OF STUDIES AND REPORTS

### FEMA FLOOD INSURANCE STUDY (FIS) AND FLOOD INSURANCE RATE MAP (FIRM)

FEMA's FIS for Jefferson Parish, LA is dated February 2, 2018. The FIS revises and updates information on the existence and severity of flood hazards within the Parish. The FIS also includes revised digital Flood Insurance Rate Maps (FIRMs) which reflect updated Special Flood Hazard Areas (SFHAs) and flood zones for the Parish. SFHA boundaries within the Parish were updated due to new detailed coastal analyses which were performed by the USACE-MVN, for FEMA. This study also incorporates the Hurricane Storm Damage Risk Reduction System (HSDRRS) completed by the USACE. Finally, these maps depict the potential for flooding and are the basis for building requirements and flood insurance rates.

### FLOOD INSURANCE CLAIMS DATA

The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of flood insurance policy and claims data to the public. This information can only be released to state and local governments for the use in floodplain management related activities. Therefore all claims data in this report are only discussed in general terms.



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## JEFFERSON PARISH HAZARD MITIGATION PLAN

The purpose of a mitigation plan is to rationalize the process of determining appropriate hazard mitigation actions. The document includes a detailed description of natural hazards in Jefferson Parish; a risk assessment that describes potential losses to physical assets, people and operations; a set of goals, objectives, strategies and actions that will guide the Parish's mitigation activities, and a detailed plan for implementing and monitoring the Plan. This Plan identified 12 hazards and included a risk assessment of the four hazards with the highest potential for damaging physical assets, people and operations in Jefferson Parish. These hazards are floods, hurricanes and tropical storms, storm surge, and tornadoes. Both the risk assessment section and goals sections reflect this emphasis, which was the result of careful consideration and a numerical ranking process carried out by the Mitigation Planning Team (MPT).



### STEP 3. BUILDING DATA COLLECTION

The on-site field survey for this analysis was conducted over multiple days in May 2018. The Collector App through ESRI was utilized to save field data from the site visits. In addition, multiple site photos were taken of each structure on the property. Photos were also taken of current drainage features and mitigation and floodproofing measures if evident from street or parking lot views. The following information was recorded for each property:

Table 1- 1

Structure	Foundation	Type	
<b>No structure</b>	49 Slab on grade	183 Residential	561
<b>Occupied</b>	536 Low (less than 2ft.)	27 Non-residential	51
<b>Vacant</b>	28 Medium	341	
	High	25	

### COLLECTOR FOR ARCGIS (ESRI)

The team used the ESRI Collector Application in order to be able to store and spatially view repetitive loss data for the City of Gretna. The Collector App contains all field data collected by parcels for RLAA including pictures of each structure on the parcel. The data is stored in ArcGIS and is used for internal review and continued analysis of repetitive flood loss areas.

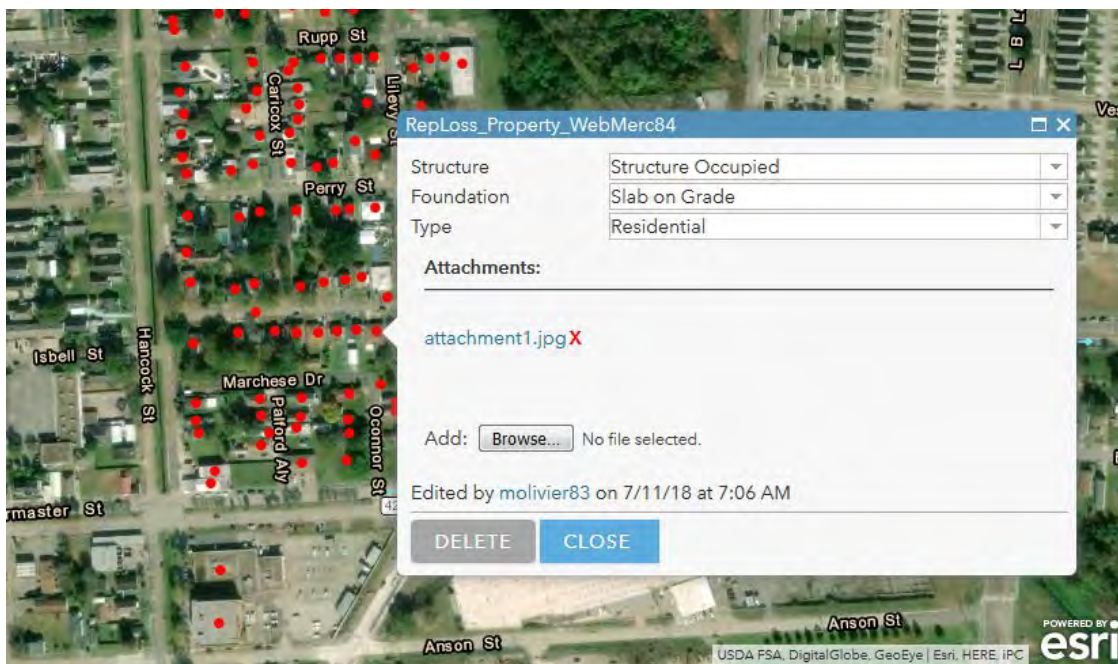


Figure 1- 6 Collector Application Sample







**CLAIMS DATA:**

In review of the unmitigated Repetitive Loss List, there are 16 properties within the 634 property study area that qualify as repetitive loss. Of those 16 repetitive loss properties, 4 are considered to be severe repetitive loss properties.

The majority of the rest of the claims are from relatively small rainfall events.

In analyzing the claims data, it could be derived that the area experiences most flooding from rainfall events. There have been 62 flood claims in the study areas totaling \$921,876.20. The average claim in the study areas is \$210,692.43. The homeowners of the 12 repetitive loss properties have made 37 claims and received \$416,685.62 in flood insurance payments since 1978. The homeowners of the 4 severe repetitive loss properties have made 25 claims, and received \$505,190.58 in flood insurance payments since 1978. The average repetitive flood loss claim was \$132,175.97 and the average severe repetitive loss claim was \$78,516.46. The severe repetitive loss homes are similar to the other homes on their block and on separate streets. They have each flooded more than 5 times, and all of them flooded during most of the heavy rainfall events in the area. (See bar graph below, Table 1-3).

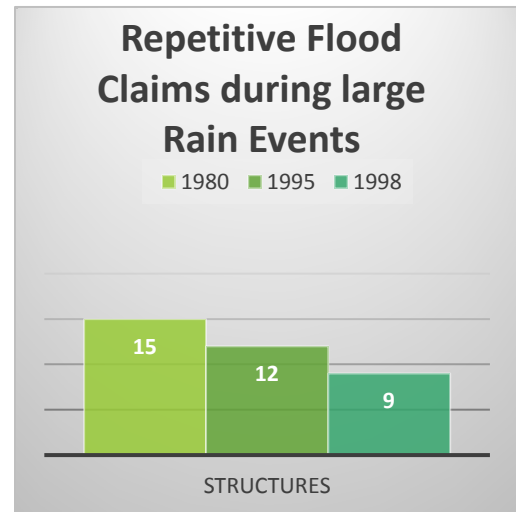


Table 1- 2



Table 1- 3



## FIELD DATA:

The on-site field survey for this analysis was conducted over multiple days in May 2018. The team collected information such as the type and height of the foundation, occupancy status of the structure, and use of the structure.

With a count of 341, the majority of the structures are medium foundation height (59%). There are 183 structures (32%) that are slab on grade. Twenty-seven (5%) structures are low (less than 2 feet from grade), and 25 structures (4%) have high foundations.

The project team observed that majority (536 or 87%) of the structures in the area are occupied, while approximately 28, or 5%, are vacant and 49 (8%) have no structure. Also, majority of the structures are of residential use (92% or 561), while 8% (51) are non-residential.

In conclusion, it should be noted that given the location of the study areas, all of the properties are inside levee protection. Majority of the properties are built slab on grade or of medium height; therefore, a heavy rain event can cause substantial damage to these properties.

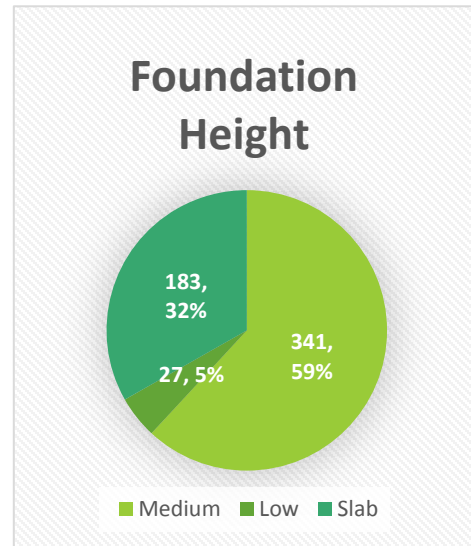


Table 1- 4

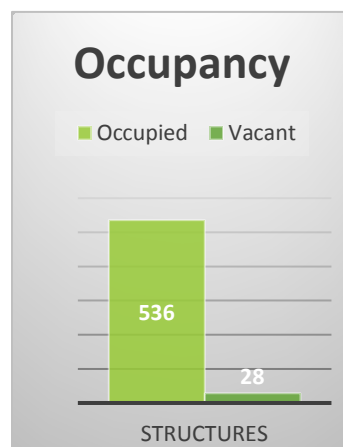


Table 1- 5

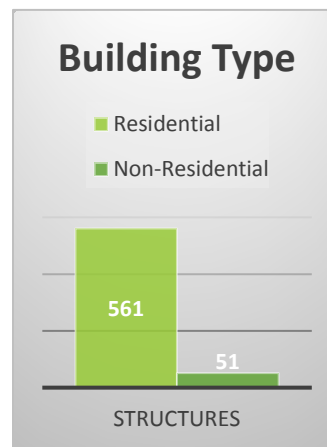


Table 1- 6



Figure 1- 8 Example property in Area 1



Figure 1- 9 Example property in Area 2





## STEP 4. REVIEW ALTERNATIVE MITIGATION APPROACHES

There are many ways to protect a property from flood damage. Different measures are appropriate for different flood hazards, building types and building conditions. Figure 1-10 below, found in the *2017 CRS Coordinator's Manual*, lists typical property protection measures.

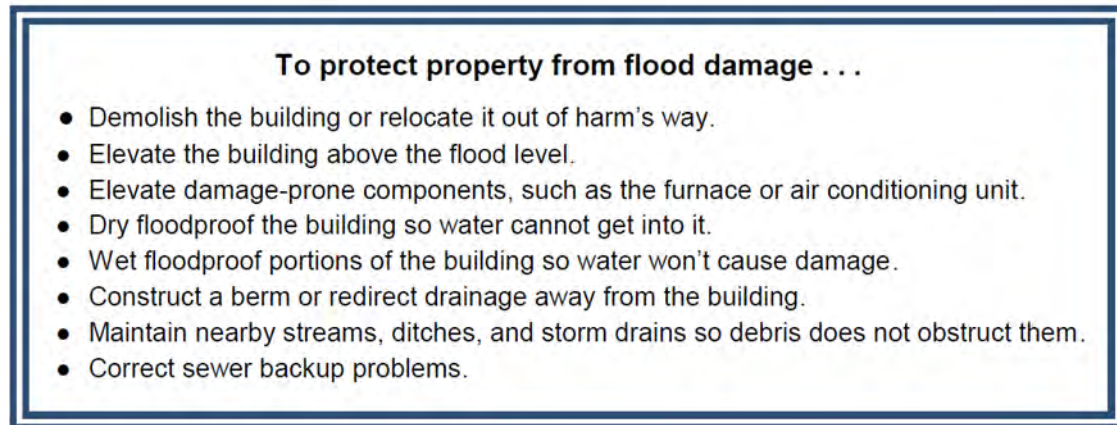


Figure 1- 10 Typical Property Protection Measures

Mitigation measures should fall into one of the mitigation categories listed below which are based on the Community Rating System planning process:

- Prevention
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information and Outreach

## MITIGATION FUNDING

There are several types of mitigation measures, listed in the table below, which can be considered for each repetitive loss property. Each mitigation measure qualifies for one or more grant program(s). Depending on the type of structure, severity of flooding and proximity to additional structures with similar flooding conditions, the most appropriate measure can be determined. In addition to these grant funded projects, several mitigations measures can be taken by the homeowner to protect their home.



Table 1-7

Types of Projects Funded	HMGP	FMA	PDM	ICC	SBA
Acquisition of the entire property by govt. agency	✓	✓	✓		
Relocation of the building to a flood free site	✓	✓	✓	✓	✓
Demolition of the structure	✓	✓	✓	✓	✓
Elevation of the structure above flood levels	✓	✓	✓	✓	✓
Replacing the old building with a new elevated one	✓	✓	✓	✓	✓
Local drainage and small flood control projects	✓	✓	✓		
Dry floodproofing (non-residential only)	✓	✓	✓		
Percent paid by Federal program	75%	75%, 90%, or 100%	75%	Up to \$30K	

There are several possible sources of funding for mitigation projects:

- **FEMA grants:** Most of the FEMA programs provide 75% of the cost of a project. In most communities, the 25% non-FEMA share is paid by the benefitting property owner. Each program has different Congressional authorization and slightly different rules.
  - **The Hazard Mitigation Grant Program (HMGP):** The HMGP provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. Projects must provide a long-term solution to a problem (e.g., elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood). Examples of eligible projects include acquisition and elevation, as well as local drainage projects.
  - **The Flood Mitigation Assistance Program (FMA):** FMA funds assist States and communities in implementing measures that reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP. Project Grants to implement measures to reduce flood losses, such as elevation, acquisition, or relocation of NFIP-insured structures. States are encouraged to prioritize FMA funds for applications that include repetitive loss properties; these include structures with 2 or more losses each with a claim of at least \$1,000 within any ten-year period since 1978.
  - **Pre-Disaster Mitigation Program (PDM):** The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. For more information visit <http://www.fema.gov/government/grant/pdm/index.shtm>.
- **Flood insurance:** There is a special funding provision in the National Flood Insurance Program (NFIP) for insured buildings that have been substantially damaged by a flood, “Increased Cost of Compliance.” ICC coverage pays for the cost to comply with floodplain management regulations after a flood if the building has been declared substantially damaged. ICC will pay up to \$30,000 to help cover elevation, relocation, demolition, and (for nonresidential buildings) floodproofing. It can also be used to help pay the 25% owner’s share of a FEMA funded mitigation project.



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The building's flood insurance policy must have been in effect during the flood. This payment is in addition to the damage claim payment that would be made under the regular policy coverage, as long as the total claim does not exceed \$250,000. Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator. For more information, contact your insurance agent or visit: [www.fema.gov/plan/prevent/floodplain/ICC.shtm](http://www.fema.gov/plan/prevent/floodplain/ICC.shtm).

Coverage under the ICC does have limitations: It covers only damage caused by a flood, as opposed to wind or fire damage. The building's flood insurance policy must have been in effect during the flood. ICC payments are limited to \$30,000 per structure. Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator and the structure must be in Zone AE.

The average claims payment in the study areas is \$210,692.43. With an average claim of that amount, it is not likely that many homes in the study area would sustain substantial damage from a flood event. Homeowners should make themselves aware of the approximate value of their homes, and in the case of incurring flood damage, be aware of the need for a substantial damage declaration in order to receive the ICC coverage.

Alternative language adopted into the local floodplain management ordinance would enable residents with shallower flooding to access ICC funding. Since local ordinances determine the threshold at which substantial damage and/or repetitive claims are reached, adopting language that would lower these thresholds would benefit the homeowners of repetitive loss properties. Adopting alternative language allows for cumulative damages to reach the threshold for federal mitigation resources more quickly, meaning that some of the properties in the City of Gretna that sustain minor damage regularly would qualify for mitigation assistance through ICC.

- **Rebates:** A rebate is a grant in which the costs are shared by the homeowner and another source, such as the local government, usually given to a property owner after a project has been completed. Many communities favor it because the owner handles all the design details, contracting, and payment before the community makes a final commitment. The owner ensures that the project meets all of the program's criteria, has the project constructed, and then goes to the community for the rebate after the completed project passes inspection.

Rebates are more successful where the cost of the project is relatively small, e.g., under \$5,000, because the owner is more likely to be able to afford the bulk of the cost. The rebate acts more as an incentive, rather than as needed financial support.

- **Small Business Administration Mitigation Loans:** The Small Business Administration (SBA) offers mitigation loans to SBA disaster loan applicants who have not yet closed on their disaster loan. Applicants who have already closed must demonstrate that the delay in application was beyond their control.

For example mitigation loans made following a flood can only be used for a measure to protect against future flooding, not a tornado. If the measure existed prior to the declared disaster, an SBA mitigation loan will cover the replacement cost. If the measure did not exist prior to the declared disaster the mitigation loan will only cover the cost of the measure if it is deemed absolutely necessary for repairing the property by a professional third-party, such as an engineer.



## MITIGATION ALTERNATIVES

The majority of the flooding in these areas is considered “nuisance” flash flooding that causes minimal damage but does require costly cleanup and numerous street closures due to floodwaters overtopping the roadway.

Flooding in Gretna can be attributed to its flat topography, aging stormwater infrastructure. Flash flooding can occur when the capacity of the drainage system is exceeded or if conveyance is obstructed by debris, sediment and other materials that limit the volume of drainage. Heavy rains within a short period of time have caused the drainage system to be inundated and unable to keep up, resulting in ponding water in streets and homes.

Improving the drainage system can eliminate some road and home inundation in this area. These structural methods require large capital expenditures and cooperation from private property owners. Promoting floodproofing techniques and increasing public education and awareness of the flood hazards can be the next best alternative for property owners in this area. The Parish’s and the City’s websites, e-mail distribution lists, press releases and variable message boards can provide benefit to business owners and residents.

## POTENTIAL MITIGATION MEASURES FOR GRETNA

### Structural Alternatives:

- **Elevate** structures and damage-prone components, such as the water heater or air conditioning unit, above the Base Flood Elevation (BFE).
- **Dry floodproofing** can be done on commercial structures and even residential structures; however, in many instances this requires human intervention to complete the measure and ensure success. For example, installing watertight shields over doors or windows requires timely action by the homeowner; especially in a heavy rainfall event.
- **Wet floodproofing** a structure involves making the uninhabited portions of the structure resistant to flood damage and allowing water to enter during flooding. For example, in a basement or crawl space, mechanical equipment and ductwork would not be damaged.
- **Acquire and/or relocate** properties/target abandoned properties or locations that would provide a public benefit as the location will need to be maintained by the City in perpetuity.
- **Increase the size of culverts** under Jefferson Hwy to allow for increased capacity.
- **Implement drainage improvements** such as increasing capacity in the system (up-sizing pipes) and provide additional inlets to receive more stormwater.
- Improve stormwater system maintenance program to ensure inlets and canals are free of clogging debris.

### Non Structural Alternatives:

- **Relocate internal supplies**, products/goods, and belongings above the flood depth.
- Improve the Parish’s floodplain and zoning ordinances.
- **Provide public education** through posting information about local flood hazards on City website, posting signs at various locations in neighborhoods or discussing flood protection measures at local neighborhood association meetings.
- Promote the purchase of flood insurance.



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- Continue coordination with GOHSEP, the National Weather Service (NWS), and United States Geological Survey (USGS) to enhance flood warning system, including the use of rain/stream gauges, to provide greater warning time for citizens. NWS can use the real-time data collected to issue timely warnings.

#### COST AND BENEFITS OF MITIGATION MEASURES

Knowing the flooding history, type, and condition of the buildings in the area, leads to the fourth step in the area analysis procedure – a review of alternative mitigation approaches to protect properties from, or reduce, future flood damage. Property owners should look at these alternatives but understand they are not all guaranteed to provide protection at different levels of flooding. Six approaches were reviewed:

- Elevating the houses above the 1% annual flood level
- Acquisition
- Floodproofing
- Drainage improvements
- Utility protection
- Maintaining flood insurance coverage on the building

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#### ELEVATION

Raising the structure above the flood level is generally viewed as the best flood protection measure, short of removing the building from the floodplain. All damageable portions of the building and its contents are high and dry during a flood, which flows under the building instead of into the house. Houses can be elevated on fill, posts/piles, or a crawlspace.

- A house elevated on fill requires adding a specific type of dirt to a lot and building the house on top of the added dirt.
- A house elevated on posts/piles is either built or raised on a foundation of piers that are driven into the earth and rise high enough above the ground to elevate the house above the flow of flood water or the design flood elevation.
- A house elevated on a crawlspace or enclosure is built or raised on a continuous wall-like foundation that elevates the house above the design flood level. It is important to include vents or openings in the walls below the design flood level that are appropriately sized: one square inch for each square foot of the crawlspace or enclosures footprint. Additionally all materials below the design flood level must be flood resistance and all machinery, equipment, and plumbing must be above the design flood level.
  - Cost: A majority of the cost to elevate a building is in the preparation and foundation construction. The cost to elevate six feet is little more than the cost to go up two feet. Elevation is usually cost-effective for wood frame buildings on posts/piles or crawlspace because it is easiest for lifting equipment to be used under the floor and disruption to the habitable part of the house is minimal. Elevating a slab house is much more costly and disruptive. In the study areas, 32% percent of the houses in the study area are on a slab. The actual cost of elevating a particular building depends on factors such as its condition, whether it is masonry or brick faced, and if additions have been added on over time. While the cost of elevating a home can be high, there are funding programs that can help. The usual arrangement is for a FEMA grant to pay 75% of the cost while the owner pays the other 25%. In the case of elevating a slab



foundation, the homeowner’s portion could be as high as \$50,000 or more. In some cases, assistance can be provided by Increased Cost of Compliance (ICC) funds, which is discussed on page 23 under Possible Funding Sources, or the use of state funds.

- Feasibility: Federal funding support for an elevation project requires a study that shows that the benefits of the project exceed the cost of the elevation. Project benefits include savings in insurance claims paid on the structure. Elevating a masonry or a slab home can cost up to \$300,000, which means that benefit/cost ratios may be low. Looking at each property individually could result in funding for the worst case properties, i.e., those that are the lowest below the base flood elevation, subject to the most frequent flooding, and in good enough condition to elevate.

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>● <b>Elevating to or above the BFE allows a substantially damaged or substantially improved house to be brought into compliance.</b></li> <li>● <b>Often reduces flood insurance premiums.</b></li> <li>● <b>Reduces or eliminates road closures due to overtopping.</b></li> <li>● <b>May be fundable under FEMA mitigation grant programs.</b></li> </ul>	<ul style="list-style-type: none"> <li>● <b>Cost may be prohibitive.</b></li> <li>● <b>The appearance of the structure and access to it may be adversely affected.</b></li> <li>● <b>May require property owner cooperation and right-of-way acquisition.</b></li> <li>● <b>May require road or walkway closures during construction.</b></li> </ul>

Table 1- 8 Advantages and Disadvantages of Elevation

**ACQUISITION:**

This measure involves buying one or more properties and clearing the site (demolishing the building). If there is no building subject to flooding, there is no flood damage. Acquisitions are usually recommended where the flood hazard is so great or so frequent that it is not safe to leave the structure on the site.

An alternative to buying and clearing the whole subdivision is buying out individual, “worst case,” structures with FEMA funds.

- **Cost:** This approach would involve purchasing and clearing the lowest or the most severe repeatedly flooded homes. If FEMA funds are to be used, three requirements will apply:
  - The applicant for FEMA must demonstrate that the benefits exceed the costs, using FEMA’s one of FEMA’s approved Benefit Cost methodologies.
  - The owner must be a willing seller.
  - The parcel must be deeded to a public agency that agrees to maintain the lot and keep it forever as open space.





- **Feasibility:** Due to the high cost and difficulty to obtain a favorable benefit-cost ratio in shallow flooding areas, acquisitions are reserved for the worst case buildings. Not everyone wants to sell their home, so a checkerboard pattern of vacant and occupied lots often remains after a buyout project, leaving “holes” in the neighborhood. There is no reduction in expenses to maintain the neighborhood’s infrastructure for the City, although the tax base is reduced. The vacant lots must be maintained by the new owner agency, and additional expense is added to the community. If the lot is only minimally maintained, its presence may reduce the property values of the remaining houses. The City of Gretna is not considering acquisitions at this time for the above reasons.

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>● <b>Permanently removes problem since the structure no longer exists.</b></li> <li>● <b>Allows a substantially damaged or substantially improved structure to be brought into compliance with the community’s floodplain management ordinance or law.</b></li> <li>● <b>Expands open space and enhances natural and beneficial uses.</b></li> <li>● <b>May be fundable under FEMA mitigation grant programs.</b></li> </ul>	<ul style="list-style-type: none"> <li>● <b>Cost may be prohibitive.</b></li> <li>● <b>Resistance may be encountered by local communities due to loss of tax base, maintenance of empty lots, and liability for injuries on empty, community-owned lots.</b></li> </ul>

**Table 1- 9 Advantages and Disadvantages of Acquisition**

There are 3 criteria that must be met for FEMA to fund an acquisition project:

- The local community must inform the property owners interested in the acquisition program that the community will not use condemnation authority to purchase their property and that the participation in the program is strictly voluntary,
- The subsequent deed to the property to be acquired will be amended such that the landowner will be restricted from receiving any further Federal disaster assistance grants, the property shall remain in open space in perpetuity, and the property will be retained in ownership by a public entity, and
- Any replacement housing or relocated structures will be located outside the 100-year floodplain.

### FLOODPROOFING

This measure keeps floodwaters out of a building by modifying the structure. Walls are coated with waterproofing compounds or plastic sheeting. Openings (i.e. doors, windows, and vents) are closed either permanently, or temporarily with removable shields or sandbags.

- **Make the walls watertight.** This is easiest to do for masonry or brick faced walls. The brick or stucco walls can be covered with a waterproof sealant and bricked or stuccoed over with a veneer to camouflage the sealant. Houses with wood, vinyl, or metal siding need to be wrapped with plastic sheeting to make walls watertight, and then covered with a veneer to camouflage and protect the plastic sheeting. Provide closures, such as removable shields or sandbags, for the openings;





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including doors, windows, dryer vents and weep holes. There must also be an account for sewer backup and other sources of water entering the building. For shallow flood levels, this can be done with a floor drain plug or standpipe; although a check valve system is more secure.

- Dry floodproofing employs the building itself as part of the barrier to the passage of floodwaters, and therefore this technique is only recommended for buildings with slab foundations that are not cracked. The solid slab foundation prevents floodwaters from entering a building from below. Also, even if the building is in sound condition, tests by the Corps of Engineers have shown that dry floodproofing should not be used for depths greater than three feet above the first floor, because water pressure on the structure can collapse the walls and/or buckle the floor.
- Dry floodproofing is a mitigation technique that is appropriate for some houses in the area: those with slab foundations that typically receive floodwater up to three feet in the house. From the fieldwork it was found that approximately thirty-two percent of the houses in the study area are on slab foundations so they may be good candidates for this type of mitigation.
- Not all parts of the building need to be floodproofed. It is difficult to floodproof a garage door, for example, so some owners let the garage flood and floodproof the walls between the garage and the rest of the house. Appliances, electrical outlets, and other damage-prone materials located in the garage should be elevated above the expected flood levels.
  - Cost: The cost for a floodproofing project can vary according to the building's construction and condition. It can range from \$5,000 to \$20,000, depending on how secure the owner wants to be from flooding. Owners can do some of the work by themselves, although an experienced contractor provides greater security. Each property owner can determine how much of their own labor they can contribute and whether the cost and appearance of a project is worth the protection from flooding that it may provide.
  - Feasibility: As with floodwalls, floodproofing is appropriate where flood depths are shallow and are of relatively short duration. It can be an effective measure for some of the structures and flood conditions found in the study analysis area. It can also be more attractive than a floodwall around a house. However, floodproofing requires the homeowner to install or place door and window shields or sandbags and to ensure maintenance on a yearly basis. This may be difficult for the elderly or disabled. Finally ample warning of flooding must be available, so the homeowner can determine when to place the door or window shields and sandbags.

Dry floodproofing has the following shortcomings as a flood protection measure:

- It usually requires human intervention, i.e., someone must be home to close the openings.
- Its success depends on the building's condition, which may not be readily evident. It is very difficult to tell if there are cracks in the slab under the floor covering.
- Periodic maintenance is required to check for cracks in the walls and to ensure that the waterproofing compounds do not decompose.
- There is no government financial assistance programs available for dry floodproofing, therefore the entire cost of the project must be paid by the homeowner.
- The NFIP will typically not offer a lower insurance rate for dry floodproofed residences. However, this may be a viable option if homeowners want to protect their structure and contents.



Advantages	Disadvantage
<ul style="list-style-type: none"> <li>• Often less costly than other mitigation measures.</li> <li>• Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors.</li> </ul>	<ul style="list-style-type: none"> <li>• Extensive cleanup may be necessary if the structure becomes wet inside and possibly contaminated by sewage, chemicals and other materials borne by floodwaters.</li> <li>• Pumping floodwaters out of a basement too soon after a flood may lead to structural damage.</li> <li>• Does not minimize the potential damage from a high-velocity flood flow and wave action.</li> </ul>

Table 1- 10 Advantages and Disadvantages of Wet Floodproofing

Advantages	Disadvantage
<ul style="list-style-type: none"> <li>• Often less costly than other retrofitting methods</li> <li>• Does not require additional land.</li> <li>• May be funded by a FEMA mitigation grant program.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires human intervention and adequate warning to install protective measures.</li> <li>• Does not minimize the potential damage from high-velocity flood flow and wave action.</li> <li>• May not be aesthetically pleasing.</li> </ul>

Table 1- 11 Advantages and Disadvantages of Dry Floodproofing



## DRAINAGE IMPROVEMENTS

The Parish is currently in the process of developing a Parish-wide Subsurface Drainage Master Plan that will include the incorporated jurisdictions such as the City of Gretna. The purpose of this Plan is to help identify deficient drainage areas throughout the Parish, develop preliminary solutions for the problem areas, split problem areas into individual projects for bidding purposes, develop cost estimates, and prioritize needed work. The Plan shall have a list of recommendations that were created after reviewing previous studies and reports. There are several different drainage improvements called for in the Drainage Master Plan that might help in reducing some of the flooding within this Repetitive Loss area. Maintenance for all projects and ongoing street sweeping continues for this area. Whenever drainage improvements are considered as a flood mitigation measure, the effects upstream and downstream from the proposed improvements need to be considered.

Advantages	Disadvantages
<ul style="list-style-type: none"><li>• Can increase channel carrying capacity through overflow channels, channel straightening, crossing replacements, or runoff volume storage.</li><li>• Minor projects may be fundable under FEMA mitigation grant programs.</li></ul>	<ul style="list-style-type: none"><li>• May help one area but create new problems upstream or downstream.</li><li>• Channel straightening increases the capacity to accumulate and carry sediment.</li><li>• May require property owner cooperation and right-of-way acquisition.</li></ul>

Table 1- 12 Advantages and Disadvantages of Drainage Improvements



## STEP 5. CONCLUSION AND RECOMMENDATIONS

### CONCLUSION

Based on the field survey and collection of data, the analysis of existing studies and reports, and the evaluation of various structural and non-structural mitigation measures, the City proposes that mitigation measures be implemented for the City of Gretna’s Repetitive Loss Areas 1 and 2. The table below examines past and current mitigation actions in these areas.

Table 1- 13 Current and Past Mitigation Actions in Areas 1 and 2

Mitigation Actions	
1	Property owners have documented flooding and identified flooding concerns in returned questionnaires from this analysis.
2	Property owners are aware of flooding causes. Some property owners have undertaken specific floodproofing measures at their own expense.
3	The Parish and City have undertaken numerous, costly capital improvement projects to improve drainage within the study area.

### RECOMMENDATIONS

The City of Gretna should continue to encourage everyone to pursue mitigation measures and assist interested property owners in applying for mitigation grants. The City of Gretna should continue to address street drainage in order to improve the drainage in the study area, seek out and secure funding for the drainage improvements outlined in this report, and institute a maintenance program that encourages homeowners to frequently clear their catch basin inlets of debris to ensure open flow for stormwater. The City of Gretna should also continue to improve its CRS classification and adopt this Repetitive Loss Area Analysis according to the process detailed in the CRS Coordinator’s Manual.

For the residents of the study areas, they should contact the City of Gretna and Jefferson Parish for more information about possible funding opportunities and site visits to determine remedial measures. Review the alternative mitigation measures discussed in this analysis and implement those that are most appropriate for their situation. Purchase and maintain a flood insurance policy on the home and its contents.

The City of Gretna recommends the following mitigation actions:

#### MITIGATION ACTION 1:

Property owners should obtain and keep a flood insurance policy on their structures (building and contents coverage). The City will continue on an **annual basis** to target all properties in the repetitive loss area reminding them of the advantages to maintaining flood insurance through its annual outreach effort.

#### RESPONSIBILITY

The City of Gretna will provide the most relevant up-to-date flood insurance information to all property owners within the repetitive loss areas located in the study area.

#### FUNDING

The cost will be paid for from the City’s operating budget.



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#### MITIGATION ACTION 2:

When appropriate, property owners should consider floodproofing measures such as flood gates or shields, flood walls, and hydraulic pumps.

#### RESPONSIBILITY

The City of Gretna will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program with assistance from Jefferson Parish.

#### FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the City's annual budget.

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#### MITIGATION ACTION 3:

Continue elevation or reconstruction mitigation of high-risk flood-prone properties. The highest priorities are properties at the greatest flood risk and where drainage improvements will not provide an adequate level of protection.

#### RESPONSIBILITY

The Jefferson Parish Floodplain Management and Hazard Mitigation department will continue to target the most at risk properties for grant applications.

#### FUNDING

Construction cost would be covered with FEMA or ICC funds. Staff time to develop the list of target properties will require funds from the department's operating budget.

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#### MITIGATION ACTION 4:

Prioritize Capital Improvement Projects to focus on drainage improvement projects in those basins containing repetitive loss areas.

#### RESPONSIBILITY

Jefferson Parish's Drainage Department in conjunction with the Engineering Department and City staff.

#### FUNDING

Bond funds or state grants.

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#### MITIGATION ACTION 5:

Encourage property owners to elevate inside and outside mechanical equipment above the BFE and install flood resistant materials in crawl spaces.

#### RESPONSIBILITY

The City of Gretna will continue to promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program with assistance from Jefferson Parish.

#### FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the City's annual budget.



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The RLAA draws upon on the existing initiatives and presents a series of mitigation recommendations related to repetitive flood loss properties in each Repetitive Loss Area, particularly via non-structural means. All recommendations are made with the intent to improve the City's Community Rating System score; thereby, reducing resident's overall insurance rates.

It is recommended that the City of Gretna i) adopt this Repetitive Loss Area Analysis according to the process detailed in the 2017 CRS Coordinator's Manual, ii) encourage the owners of repetitive flood loss structures to pursue a mitigation measure, iii) continue to assist interested property owners in applying for mitigation grants, iv) continue to improve and maintain the drainage system, and finally v) continue public information activities such as outreach projects, website postings and flood protection assistance that help residents learn about various mitigation measures.

Additionally, it is recommended that the property owners participate by i) reviewing the mitigation measures listed in this report and implement those as appropriate, ii) stay updated on the City of Gretna's flood risk reduction initiative and finally, iii) purchase or maintain a flood insurance policy on their home and contents (see [www.floodsmart.gov](http://www.floodsmart.gov) for more information).

The draft RLAA report for the City of Gretna was posted on the Jefferson Parish website [www.jeffparish.net/RLAA](http://www.jeffparish.net/RLAA) for comments from July 20 through August 1, 2018. No comments were received.