Repetitive Loss Area Analysis #12
City of Kenner, LA - University City Area

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University of New Orleans
Center for Hazards Assessment, Response and Technology
(UNO-CHART)

www.floodhelp.uno.edu

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Acknowledgements
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List of Terminology

100-year Flood: it is the flood elevation that has a one percent chance of being equaled or exceeded each year.

Area Analysis: An approach to identify repeatedly flooded areas, evaluate mitigation approaches, and determine the most appropriate alternatives to reduce future repeated flood losses.

BFE: Base Flood Elevation: The elevation of the crest of the base flood or 100-year flood.

UNO-CHART: Center for Hazards Assessment, Response and Technology at the University of New Orleans

cfs: Cubic feet per second, the means by which the flow of water is measured

CRS: Community Rating System, voluntary incentive program that recognizes and encourages community floodplain activities that exceed the minimum National Flood Insurance Program (NFIP) requirements

ETJ: Extraterritorial Jurisdiction

FEMA: Federal Emergency Management Agency

FIRM: Flood Insurance Rate Map

Floodway: The channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent annual chance flood can be carried without substantial increases in flood heights.

Freeboard: A factor of safety usually expressed in feet above a flood level for purposes of floodplain management.

GIS: Geographic Information Systems

Hazard Mitigation: Any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event.

ICC: Increased Cost of Compliance, a $30,000 rider on flood insurance policies for policy holders located in the special flood hazard area that can be used to bring the structure into compliance in the event that it is substantially damaged by a flood.

msl: Mean sea level

NFIP: National Flood Insurance Program

NWS: National Weather Service

Repetitive Flood Loss (RL): An NFIP-insured property where two or more claim payments of more than $1,000 have been paid within a 10-year period since 1978.

SFHA: Special Flood Hazard Area

Severe Repetitive Flood Loss Properties (SRL): As defined by the Flood Insurance Reform Act of 2004, 1-4 family residences that have had four or more claims of more than $5,000 or two claims that cumulatively exceed the reported building’s value. The Act creates new funding mechanisms to help mitigate flood damage for these properties.

Substantial Improvement: The repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure either, (1) before the improvement or repair is started, or (2) if the structure has been damaged and is being restored, before the damage occurred

USGS: United States Geological Survey
**Introduction**
Flooding is a problem far too familiar to many neighborhoods across the United States. Enduring the consequences of flooding over and over again can be quite frustrating. When the water rises, life is disrupted, belongings are ruined, and hard-earned money is spent.

This report has been created in collaboration with the City of Kenner and Jefferson Parish officials, and the owners of homes in a repetitively flooded area who have continually suffered the personal losses and stresses associated with living in a flood-prone house. The goal is to help homeowners reduce their flood risk by providing a broader understanding of the flooding problems in their neighborhood, and the potential solutions to the continual suffering that results from repetitive flooding. The availability of possible funding sources for certain mitigation options is also discussed.

Here, flooding issues and potential mitigation measures are discussed for homes located in the University City Area in Kenner, LA. Not all mitigation measures are appropriate for all homes in the study area; while the homes in this study are representative of other homes throughout the neighborhood.

It is understood that there are many stresses associated with repetitive flooding including worry about how high the water may rise, the loss of personal belongings, the possibility of mold, and whether or not neighbors will return after the next event. Adding to this worry is the uncertainty related to the potential solutions. Should I elevate and if so, how high? How much will a mitigation project cost? What will my neighborhood look like if I am the only one to mitigate, or the only one not to mitigate? Is there a solution that might work for the entire neighborhood?

These questions are common, and this report attempts to answer them according to the specific situation faced by homeowners in the University City Area. Informed homeowners can take steps to protect themselves and become even stronger advocates for policy change at the neighborhood, city, county, state and even federal levels. Overall, it is hoped that by gaining a better understanding of the flooding issues, neighborhoods can become safer and homeowners better able to confront the hazard of flooding.

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**Repetitive Loss Area Analysis (RLAA):** An approach that identifies repetitive loss areas, evaluates mitigation approaches, and determines the most appropriate alternatives to reduce future losses.

**Hazard Mitigation:** Any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event.
Background

The National Flood Insurance Program (NFIP) is continually faced with the task of paying claims while trying to keep the price of flood insurance at an affordable level. It has a particular problem with repetitive flood loss properties, which are estimated to cost $200 million per year in flood insurance claim payments. Repetitive flood loss properties represent only 1.4% of all flood insurance policies, yet historically they have accounted for nearly one-third of the claim payments (over $9 billion to date). Mitigating these repeatedly flooded properties will reduce the overall costs to the NFIP, the communities in which they are located, and the individual homeowners. Ultimately, mitigating repeatedly flooded properties benefits everyone.

The University of New Orleans’ Center for Hazards Assessment, Response and Technology (UNO-CHART) receives funding from FEMA to collate data and analyze the repetitive flood loss areas in Louisiana and Texas in conjunction with local governments, elected officials, residents, and neighborhood associations. Using a geographic information system (GIS) and geo-coded flood insurance claims data, repeatedly flooded areas and properties are being prioritized for attention and analysis. In selected locations where repetitive flooding is a problem, UNO-CHART works with local officials and residents to conduct in-depth analyses of the causes and possible solutions to the flooding problem. These efforts are called “Area Analyses.”

UNO-CHART conducted an “area analysis” case study in the University City Area. An area analysis follows FEMA guidelines to determine why an area has repeated flood losses and what alternative flood protection measures would help break the cycle of repetitive flooding.

The Area

University City is located in Kenner, and is bounded by Interstate 10 to the south, Joe Yenni Boulevard to the north, Old Miss Drive to the East, and Tulane Drive to the West. The study area is a subsection of the University City neighborhood, and is located between Vintage Drive and West Esplanade Avenue, and West Loyola Drive and Tulane Drive. There are 262 properties in the study area; 70 (27%) of which are repetitive loss (RL) properties, and 17 (6%) of which are severe repetitive loss (SRL) properties. Given the size of the University City neighborhood – over 3000 properties – a smaller study area was selected with homes that are representative of the entire neighborhood.

Repetitive Loss (RL): Any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period since 1978. A repetitive loss property may or may not be currently insured by the NFIP.

Severe Repetitive Loss (SRL): 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 2004 Act creates new funding mechanisms to help mitigate flood damage for these properties.
Process: Generally, this area analysis follows a FEMA-prescribed five step process. However, the UNO-CHART team has enhanced the five-step process by adding two important steps: a detailed area selection step and an ongoing collaborative relationship with the neighborhood. During the area selection process information about the area is reviewed including the repetitive flood loss claims data as well as other relevant information about the neighborhood such as the flooding history, and the interest of the residents in learning more about flood mitigation. This is done as a joint effort with UNO-CHART team members, local officials, and residents.

Figure 1: The University City Study Area
The ongoing collaborative relationship is offered to the selected community. UNO-CHART will continually be available to provide homeowners with information concerning mitigation measures, policy issues, or other flooding related matters as requested; and a ‘follow-up’ with the community will be conducted after a period of time has passed.

**Detailed Area Selection:** The area to be studied was selected through a review of the repetitive flood loss claims data as well as other relevant information about residents of the area such as their interest in flood mitigation. This was done through a collaborative effort with FEMA Region VI – Mitigation Division, and the City of Kenner’s Department of Inspection and Code Enforcement.

**Step 1:** Advise all the property owners in the repetitive flood loss area that the analysis will be conducted.

**Step 2:** Collect data on the analysis area and each building in the identified study area within the neighborhood to determine the cause(s) of the repetitive damage.

**Step 3:** Review alternative mitigation approaches and determine whether any property protection measures or drainage improvements are feasible.

**Step 4:** Contact agencies or organizations that may have plans that could affect the cause or impacts of the flooding.

**Step 5:** Document the findings, including information gathered from agencies and organizations, and relevant maps of the analysis area.

**Ongoing Collaboration with the Neighborhood:** UNO-CHART establishes an ongoing collaborative partnership with the residents and the City. The UNO-CHART role includes providing homeowners with information concerning mitigation measures, policy issues, or other flooding related matters as requested. UNO-CHART will also conduct a ‘follow-up’ with the community after a period of time has passed.

**Detailed Area Selection Process**

In February of 2010, after a careful review of the locations of repetitive flood loss properties throughout the State of Louisiana, a team from UNO-CHART visited The University City Civic Association and met with local officials from the Department of Inspection and Code Enforcement. The City is in the Community Rating System (CRS)\(^1\) indicating an interest in flood safety, and has a current\(^2\) CRS class rating of a seven.

A neighborhood organization, The University City Civic Association, was identified as a group that could be a point of contact with the residents for the UNO-CHART team. It

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\(^1\) More information about the CRS can be found on page 26 of this report.

\(^2\) Current as of 5/1/2010
was determined at this time that because of the commitment of local officials and neighborhood residents to floodplain management, and the number of repetitive flood loss properties, the University City area would be a good site for an area analysis.

**Step 1: Advise the Homeowners**

The first step of the FEMA five-step process is to advise the neighborhood about the project. In April 2010, the City of Kenner’s Department of Inspection and Code Enforcement sent a notice to the homeowners introducing them to the project, and informing them that researchers from UNO-CHART would be collecting data about their neighborhood. The letter included a data sheet to be completed by the homeowners. Copies of the letter and data sheet can be found in Appendices A and B in this report.

**Step 2: Data Collection**

The second step in the process was the collection of relevant data on the problem (i.e., the properties exposed to the flooding and cause(s) of the repetitive damage). For a complete list of the stakeholders, see Step 4 of this report. There were five primary sources of data and information:

I. Community Information
II. Flood Insurance and Flood Event Data
III. Drainage Information
IV. Flooding Experiences of Homeowners
V. On-Site Data Collection

I. Community Information

The UNO-CHART team reviewed the following plans for information related to flooding in the University City Area:

A. *Jefferson Parish Hazard Mitigation Plan: 2010 Update*
B. *The City of Kenner Flood Damage Prevention Ordinance*³

**A. Jefferson Parish, Louisiana - 2010 Hazard Mitigation Plan Update:** The Jefferson Parish Hazard Mitigation Plan (hereto after “The Plan”) addresses flooding in *Section 6: Hazard Identification, Profiling, and Ranking*. Flooding occurs throughout the year, but the biggest threat of flooding comes in the late summer months during Hurricane season when elevated water surfaces and heavy rainfall can combine.

On the Eastbank of Jefferson Parish where the City of Kenner is located, there is the Lake Pontchartrain and vicinity hurricane protection levee to prevent or minimize flooding by hurricane surge coming in from the Lake. The Plan also notes that the City of Kenner is protected from internal rainfall flooding by a pump station that is located in the Parish

³ The Flood Damage Prevention Ordinance can be obtained from [www.municode.com](http://www.municode.com)
Line Canal between Jefferson and St. Charles Parishes. Floods – either from rainfall ponding or storm surge – are listed as the most recurrent and expensive hazard to Jefferson Parish.

Appendix I of The Plan details the hazards that face City of Kenner specifically, as well as risk assessment, mitigation goals, actions, and accomplishments. The hazards identified as most destructive for the City include:

- Floods
- Hurricanes and tropical storms
- Storm surge
- Tornadoes

Section 1.2.1 – 1.2.3 of Appendix I covers floods, hurricanes and tropical storms, and storm surge in the City of Kenner. Floods are listed as being a significant threat as the City is almost completely in the flood Zone A which is in the special flood hazard area (SFHA) meaning that is it subject to flooding. While some of the City is in the X500 flood zone – meaning that it is subject to the 500-yr flood event – most of Kenner is in the A Zone and is subject to the 1% annual storm.

Hurricane Katrina is listed as the most catastrophic storm to affect the City of Kenner in recent memory. The heavy rain event coupled with the loss of electrical power at the Parish Line pump station led to flooding in the northern and northwestern parts of Kenner. University City in particular suffered heavy flooding as a result of Hurricane Katrina. Being only 50 miles from the coast, Kenner is protected from hurricane winds by marshes and wetlands. Even still, the strength of a major hurricane gusts can still be felt and could pose a threat to Kenner and the surrounding areas.

Storm surge happens as hurricanes or tropical storms travel towards land and push water against a coastline, eventually causing flooding. Being located on the southern shore of Lake Pontchartrain, Kenner is subject to storm surge, but is protected by a levee that runs along the shoreline of the lake. The storm surge from Hurricane Katrina was estimated to be between 6-9 feet along the south shore – northern Kenner – of Lake Pontchartrain. It was the failure of this

### Mitigation Goals for the City of Kenner

**Goal #1**
“Identify and pursue preventative measures that will reduce future damages from hazards”

**Goal #2**
“Enhance public awareness and understanding of disaster preparedness”

**Goal #3**
“Reduce repetitive flood losses in the City by pursuing various mitigation measures (elevations and floodproofing)”

**Goal #4**
“Facilitate sound development in the City so as to reduce or eliminate the potential impact of hazard”
storm surge levee system during Katrina that caused the flooding in New Orleans. Kenner cannot be considered completely protected from all possible storm surge flooding.

The Mitigation Goals and Accomplishments and Mitigation Actions for the City of Kenner are discussed in Sections 1.4 – 1.5 of Appendix I in the Jefferson Parish Hazard Mitigation Plan. The City adopted four goals that would have the largest impact in hazard reduction. The Mitigation Action Plan for the City of Kenner is somewhat dependent upon funding becoming available from outside sources. This report will cover funding opportunities available on page 25. Each of the four goals has various action items that accompany them, and these are listed in Appendix E.

B. The City of Kenner Flood Damage Prevention Ordinance (Sec. 5-149); Methods of reducing flood losses: In the high risk AE flood zone, the Special Flood Hazard Area (SFHA), certain requirements exist for new and substantially improved (the value of the building increased by at least 50% due to the renovation) buildings.

In the SFHA, where the base flood elevation (BFE) has been established, all new construction and substantially improved buildings must have the lowest floor elevated to or above the BFE. Any enclosed space located below the lowest floor of living space must be used for parking of vehicles, building access or storage. The enclosed space must include properly sized and located flood vents that allow for the entry and exit of floodwaters.
II. Flood Insurance Data

A. Flood Insurance Rate Map, March 23, 1995: A Flood Insurance Rate Map (FIRM), published by FEMA, shows potential flood risk according to zones of severity and is used in setting flood insurance rates. The regulatory floodplain used by FEMA for the floodplain management and insurance aspects of the National Flood Insurance Program is based on the elevation of the 100-year flood.

It may be easily misconstrued that the 100-year flood happens only once in 100 years. In actuality, the 100-year flood has a 1% chance of occurring in any given year while the 10-year flood has a 10% chance of occurring in a given year.

The University City analysis area falls in an A Zone meaning that it is in the Special Flood Hazard Area (SFHA). Figure 2 shows the City of Kenner’s FIRM for the University City analysis area. The base flood elevation (BFE) is the elevation of the 100-year flood above sea level. The BFE for the University City area is -3.5 feet below sea level. Over the years, the drainage and pumping system have caused the ground level to subside, so that it is well below sea level. As a result, the base flood elevation is below sea level, an occurrence that is unique to the New Orleans area.

B. Preliminary Digital Flood Insurance Rate Map (DFIRM): As part of the FEMA Map Modernization Plan, the United States Army Corps of Engineers (USACE) has been charged with updating and developing Digital Flood Insurance Rate Maps (DFIRMs). In October 2008, FEMA released a Preliminary DFIRM for Jefferson Parish. The
Preliminary DFIRM information for the University City study area places it in an AE zone. The “E” associated with “AE” means that there is an elevation to which the lowest floor of livable space must be elevated. Currently under the 1995 effective FIRM, the study area in University City is in an A Zone. The City of Kenner is using the 1995 FIRM for all regulatory purposes, except where the preliminary DFIRM has higher base flood elevations in place. All flood insurance policies are currently rated under the 1995 effective FIRM.

When the DFIRM was first delivered to Jefferson Parish there were complications for the Westbank of Jefferson Parish, as the Army Corps was still in the process of updating and certifying the levee system. Once this is complete in 2011, the official adoption process for the new DFIRM will begin for the Westbank of Jefferson Parish. The City of Kenner, like other municipalities on the Eastbank, would see some BFEs being decreased with the release of the new DFIRM. Given the situation with the rest of the Parish, the City of Kenner is currently awaiting the delivery of a revised DFIRM that is being developed solely for Unincorporated Jefferson Parish on the Eastbank and Kenner.

C. Claims Data: The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of certain types of data to the public. Flood insurance policy and claims data are included in the list of restricted information. FEMA can only release such data to state and local governments, and only if the data are used for floodplain management, mitigation, or research purposes. Therefore, this report does not identify the repetitive loss properties or include claims data for any individual property.

The UNO-CHART team obtained claims data from FEMA Region VI for all repetitive flood loss properties in the University City study area. Six of the claims dates for the study area coincide with FEMA declared disasters:

<table>
<thead>
<tr>
<th>Claim Date(s) per event</th>
<th>Number of claims per event</th>
<th>Claims totals per event</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/25/1978</td>
<td>1</td>
<td>$1,911.19</td>
</tr>
<tr>
<td>05/03/1978</td>
<td>2</td>
<td>$12,231.85</td>
</tr>
<tr>
<td>02/06/1979</td>
<td>2</td>
<td>$11,004.22</td>
</tr>
<tr>
<td>03/29/1980</td>
<td>1</td>
<td>$6,100.00</td>
</tr>
<tr>
<td>04/02/1980</td>
<td>3</td>
<td>$5,311.36</td>
</tr>
<tr>
<td>04/13/1980</td>
<td>56</td>
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<td>12/04/1982</td>
<td>9</td>
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<tr>
<td>04/06/1983</td>
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<td>$443,788.64</td>
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<tr>
<td>12/28/1983</td>
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<td>$94,999.52</td>
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<tr>
<td>11/07/1989</td>
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<td>$28,927.58</td>
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<td>12/03/1990</td>
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<td>04/29/1991</td>
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<td>05/08-09/1995</td>
<td>37</td>
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<tr>
<td>12/29/1996</td>
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<td>01/05/1998</td>
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<td>03/04/2001</td>
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<td>$4,242.44</td>
</tr>
<tr>
<td>09/25-26/2002</td>
<td>12</td>
<td>$132,129.61</td>
</tr>
</tbody>
</table>

Pre Katrina Total: 218 $1,753,885.87  
Katrina Total: 41 $3,016,399.24  
Total Loss: 259 $4,778,763.01

Table 1: Repetitive Flood Loss Claims
05/03/1978, Disaster Declaration 556: Severe Storms and Flooding
04/02/1980, Disaster Declaration 616: Severe Storms and Flooding
04/29/1991, Disaster Declaration 902: Flooding and Severe Storms
05/08-09/1995, Disaster Declaration 1049 Severe Storms and Flooding
09/25/2002, Disaster Declaration 1435: Tropical Storm Isidore
08/29/05, Disaster Declaration 1603: Hurricane Katrina

Only two of those declarations were for hurricanes or tropical storms, while the rest were issued following a severe rain event. This shows that the study area is susceptible to flooding from heavy rain events that overload the drainage system.

There are 70 (27%) properties within the 262 property study area that qualify as repetitive loss. As described in Table 1 the homeowners for the 70 repetitive loss properties have received $4,778,763.01 in flood insurance payments since 1978. The average repetitive flood loss flood claim is $18,450.82. The most costly flood event excluding Hurricane Katrina was in May of 1995 when 37 claims were filed for a total of $619,877.77. It is likely that the data in this section understate the flooding problem for four reasons:

1. NFIP records do not include claims data prior to 1978, so there could be additional losses not shown here.
2. Policy holders may not have submitted claims for smaller floods for fear of it affecting their coverage or their premium rates.
3. Only data for insured repetitive loss properties were reviewed. There could be other properties that have been repeatedly flooded, but did not have insurance at the time of the flood or did not submit claims and there are likely other properties that have had only one claim, which are not in the database available for this project.
4. The dollar figures only account for items covered by the insurance policy. Things not covered include living expenses during evacuation, swimming pools, and automobiles.

III. Drainage Information

A. Flooding Problem: The City of Kenner has always been subject to repetitive flooding and property loss as a result of heavy rain events. Rain must be collected by the drainage canals and pumped out, as the low flat terrain rarely allows for gravity drainage. Flooding of a significant level has occurred in 1980, 1983, 1995, and most notably in 2005. These flooding events were the result of heavy rain ponding and Hurricane Katrina.

The drainage system in Jefferson Parish consists of a network of canals, ditches, and pump stations. Throughout Jefferson Parish, including the City of Kenner, the land elevation is often below sea level leading to the necessity of levees throughout the Parish. Stormwater drainage in Kenner consists of a subsurface drainage network of pipes and catch basins that the City maintains, and discharge canals and pumps stations that are maintained by Jefferson Parish. This system also includes protection from storm surge by levees around both the east and west banks of the Parish. Levees not only assist in
keeping the water out, but also result in water from rain events being kept within their reaches. Due to this unique situation, Jefferson Parish is reliant upon pump stations to move rain water from inside the drainage canals to outside the levees.

The Parish operates the pumps to keep the water levels within the major outfall canals at a certain height. Once that height is breached during a rain event, the pumps are turned on and the water level is maintained. During Hurricane Katrina the pump stations lost power, and as a direct result the City of Kenner suffered severe flooding; in the University City study area, 41 flood claims were filed totaling $3,016,399.24.

There are two potential flooding sources for the University City study area:
1. A heavy rain event that overloads the pump stations capacities to move water out of the area. This can be more severe if the pumps are not operating, as happened in Kenner during Katrina.
2. Storm surge flooding that overtops or destroys the levees, as happened in New Orleans during Katrina.

B. Existing Conditions: Jefferson Parish is divided into three drainage basins: Jefferson Parish Eastbank, Jefferson Parish Westbank east of Harvey Canal and Jefferson Parish Westbank west of the Harvey Canal. The Eastbank drainage basin is then further divided into subbasin JE1 and JE2. The University City study area is located in subbasin JE1.

There are five pump stations that drain the 44.2 square miles of Jefferson Parish that make up JE1 – Bonnabel, Suburban, Elmwood, Duncan, and the Parish Line stations. The University City area is drained mainly by the Duncan and Parish Line stations. During Hurricane Katrina, the water level in Lake Pontchartrain rose dramatically, and the Duncan pump stations had nothing to stop the lake water from backing up into the pump stations, flowing through the canals, and into the streets. Since Hurricane Katrina, the Duncan pump station has had a backflow preventer installed. The Duncan pump station has also had a safe room installed so that pump operators would be able to safely remain behind and operate the pumps during a heavy rain event, tropical storm or hurricane.

C. Flood Control Projects: The study area drains westward into Canal No. 17, which in turn drains north into Canal No. 7 and then east into the Duncan Canal and finally north out into Lake Pontchartrain via the Duncan pump station. Jefferson Parish has studied the possibility of rerouting part of the water in Canal No. 17 south to drain out of the Parish Line pump station. The Parish Line pump station would have to be increased from its current 900 cfs\(^4\) to 2,300 cfs to accommodate the increased drainage. Jefferson Parish has conducted the preliminary design for the pump station and canal improvements, and at this time construction is awaiting funding. \(^5\) Jefferson Parish is also currently investigating the possibility of canals No. 17 and 7 being constricted due to box culverts and/or bridges impeding their flow. The results of this study are anticipated in the next few months.

Canal No. 17 has also undergone bank stabilization; while not a drainage improvement, will assist in securing the soundness of the structure in the future.

\(^4\) Cubic Feet per Second: the rate at which water flow is measured
\(^5\) Correspondence with the City of Kenner Department of Public Works
Working with the City of Kenner’s Department of Public Works, the Master Drainage Plan was reviewed and there are two drainage improvements recommended within the study area. The study area falls within Drainage Quad No. 6, and has within it drainage subbasins 102051 and 102073. Drainage subbasin 102051 is situated towards the northern section of the study area; between West Loyola and Tulane, and between Ogletorpe and Vintage. Drainage subbasin 102073 is located towards the southern section and extends southwardly outside of the study area. Although some of the improvements are not happening within the study area, it will be impacted by these improvements. See Figure 3 for the location of the drainage subbasins and the proposed improvements on the next page.

Drainage subbasin 102051 improvements include the removal of undersized drainage pipes at West Louisiana State Drive at Purdue Place as well as just north of it. The existing 15 inch pipes will be replaced with 24 inch pipes. The proposed work also includes adjusting the catch basins and drop inlets, removing and replacing the necessary road, sidewalks, and driveways.

In drainage subbasin 102073, the recommended improvements include replacing the existing 18 inch drainage pipe on Tulane Avenue south of West Esplanade with a 24 inch pipe to increase capacity. The 21 inch drainage pipe on Tulane Avenue and West Esplanade Avenue will also be increased to a 24 inch pipe. The work will include the necessary removal of the old pipes, the removal and replacement of the roadways, sidewalks, and driveways as needed, as well as the adjustment of the catch basins and drop inlets.

The majority of flooding experienced during Hurricane Katrina was due to the loss of power at the pump stations, as well as backflow from Lake Pontchartrain. The Duncan pump station was improved after Hurricane Katrina to prevent backflow from the lake entering, and causing flooding along the drainage canals. At the Duncan pump station a safe room to house pump operators during a storm event, and stormproofing have already taken place. Stormproofing can include improving the structural soundness, improved fuel, water, mechanical and electrical systems and remote operation ability. The Parish Line pump station does not have a safe room, but can now be operated remotely from the Duncan pump station.

The Southeast Louisiana Project (SELA) was authorized by the U.S. Congress in Fiscal Year 1996 to provide for engineering, design and construction of projects for flood control and drainage in Jefferson, Orleans, and St. Tammany Parishes. This was a Federal legislative response to repetitive flood losses in the region, particularly due to the heavy rainfalls which occurred during May 8-10, 1995. In Jefferson Parish, there have been improvements to the levees that protect Kenner, and work is ongoing. More information can be found at http://www.selaprojects.com/.

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6 Phone conversation with the City of Kenner’s Floodplain Manager 7/30/10
7 Jefferson Parish Hazard Mitigation Plan – 2010 update, Section 8.5, pg 3.
Drainage Information Update – September 10, 2010

University City is in the process of having a new sewage lift stations installed at West Loyola Drive and West Stanford Place. The construction is running approximately four months behind schedule, but is currently 90% complete. Jefferson Parish Department of Public Works is aiming to test the new lift station by the end of September.

The new lift station is replacing one that can move 2,050 gallons per second, and will have a capacity of 2,700 gallons per second. The existing station is operating, but it is in need of substantial repairs and maintenance.8

IV. Flooding Experiences of Homeowners

As previously mentioned, the letter to the residents living in the University City analysis area from the City of Kenner included a data sheet. Of the 262 properties to which letters were sent, 27(10%) were returned as “undeliverable”. In total, 42 residents responded, equaling a response rate of around 18% which is about average for this type of research. According to the returned data sheets:

- 44% of the respondents moved to the study area between 1970 and 1990.
- 88% of the respondents live in houses that are on slab foundations, and the remaining 12% are on either crawlspace or combination foundations.
- 95% of the respondents have had flooding problems, 71% with water between 1.5 feet and 3 feet inside the house, for up to 30 days.

Excluding the events that surrounded Hurricane Katrina, most respondents feel that the source of their flooding is from storm surge waters and storm sewer back-up. Flooding that happened during Hurricane Katrina is overwhelmingly (71%) attributed to the pump stations not operating or being off.

Many residents have taken some form of mitigation action on their properties. Nearly twenty-nine percent of respondents have moved utilities and/or contents up to a higher level, fourteen percent have elevated all or parts of their homes, and twelve percent have regraded their yards to keep water away from the building. Another twelve percent of respondents are in the process of elevating. Ninety-eight percent of residents are currently carrying a flood insurance policy on their property. The full results of the homeowner’s data sheet are given in Appendix C.

V. On-Site Data Collection

On June 10th, 2010, a team from UNO-CHART visited the study area and collected information about each property. The team found:

- 89.31% (234) the houses in the study area are on slab foundations
- 9.92% (26) are on a crawlspace foundation
- 0.38% (1) are on a mixed foundation
- 0.38% (1) are on piles/piers.
- 98.47% (258) of the houses are one-story structures, the remaining 1.5% (4) of the homes are 1.5 stories
- 85% (222) of the homes have their first floor of living space between grade and one foot above grade

The data collected by the team are presented in Appendix D.

<table>
<thead>
<tr>
<th>Year Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970 - 1980</td>
<td>28%</td>
</tr>
<tr>
<td>1981 - 1990</td>
<td>16%</td>
</tr>
<tr>
<td>1991 - 2000</td>
<td>19%</td>
</tr>
<tr>
<td>2001 - 2010</td>
<td>26%</td>
</tr>
<tr>
<td>No Answer</td>
<td>9.5%</td>
</tr>
</tbody>
</table>

Table 2: Respondents by year moved into study area
Problem Statement

Based on the data collected from the five sources of information (community information, flood insurance data, drainage information, flooding experiences of homeowners, and on-site data collection) the following bullets summarize the repetitive flooding problems in the University City area:

- Flooding is due to heavy rain events
- There are two situations that produce flooding
  - A heavy rain event that overloads the pump stations capacities to move water out of the area. This can be more severe if the pumps are not operating, as happened in Kenner during Katrina.
  - Storm surge flooding that overtops or destroys the levees, as happened in New Orleans during Katrina.
- Homes in the study area fall within the more risky A flood zone.
- There are 70 repetitive flood loss properties as defined by FEMA in the study area, indicating that the neighborhood has a history of repetitive flooding.
- Residents’ report varied flood depths ranging from in the yard only to up to 6 feet inside homes, for up to 30 days.

Step 3: Mitigation Measures

Knowing the flooding history, and types and condition of the buildings in the area leads to the third 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. Five approaches were reviewed:

I. Elevating the houses above the 100-year flood level
II. Constructing small berms or floodwalls around one or more houses
III. Dry floodproofing
IV. Higher regulatory standards
V. Maintaining flood insurance coverage on the building

I. 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 either 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.

A house elevated on a crawlspace is built or raised on a continuous wall-like foundation that elevates the house above the flood level. If a crawlspace is used, it is important to include vents or openings in the crawlspace that are appropriately sized: one square inch for each square foot of the building’s footprint. Figures 3 and 4 show elevated houses in the University City area.

A. Cost: Most 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 because it is easiest to get lifting equipment under the floor and disruption to the habitable part of the house is minimal. Elevating a slab house is much more costly and disruptive. Eighty-nine percent of the houses in the University City 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 on a slab 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 elevation, the homeowner’s portion could be as high as $25,000 or more. In some cases, assistance can be provided by Increased Cost of Compliance (ICC) funds, which is discussed on page 27, or state funds.

B. 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 home or a slab can cost up to $100,000, 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 lowest, subject to the most frequent flooding, and in good enough condition to elevate.
II. Barriers to Floodwaters

Small floodwalls, levees, or berms could be constructed around one or more properties if flood depths are less than three feet. Small floodwalls are appropriate for some homes in the University City area. Homes that typically receive three feet of floodwater, or less, above the ground can benefit from small floodwalls, levees or berms. Given the flood depths reported by residents on the returned data sheets barriers could be an appropriate mitigation measure for some homes in the University City analysis area.

According to the returned data sheets, 70% of respondents experienced up to three feet of floodwater inside their homes during a flood event. Levees and berms are more suitable for larger lots, and small floodwalls that are located close to the house are appropriate for suburban style neighborhoods with front and side yard space. Given the suburban styling of the University City study area and neighborhood as a whole, small floodwalls are more appropriate in the smaller lots.

If a floodwall is built around a house, it is important to include a sump pump with a backup generator so that rainwater can be pumped to the outside of the protected space. An engineer should be consulted before beginning a floodwall project, and residents should contact the City of Kenner’s Permitting Office to inquire about a permit. Figures 6 and 7 above show examples of a floodwall and sump pump.

City of Kenner Permitting Office

2000 18th Street
Annex Building

Phone: (504) 468-4062 or (504) 468-4063

Monday – Friday 8:30 – 4:30
Soil permeability is a flooding concern. Permeable soil will allow floodwaters to seep under the barrier. This is a particular problem when floodwaters stay up for a long time. As seen on the soils map in Figure 8, the soil type found in the University City area is called Fresh Organic and Mineral Deltaic Deposits. This type of soil is not very permeable, which is preferable for a barrier such as a small floodwall. It is important to have a soil sample checked by an engineer to determine its exact permeability. Homeowners who are interested in constructing a barrier to protect their house should consider the following requirements:

- A method to close openings, such as the door in the photo in Figure 10 on page 21. Generally, this requires “human intervention,” meaning someone needs to be available and have enough time to take action.
- Relatively impervious soils to minimize seepage under the floodwall.
- A system to prevent sanitary sewer backup from flowing into the building.
- A system of drain tile (perforated pipes) that collects water that falls or seeps into the protected area and sends it to a collecting basin or “sump.”
- A sump pump to send the collected water outside the barrier.
- Power to operate the sump pump around the clock during a storm.

A. Cost: The cost of a local barrier depends on the depth of flooding and the amount of engineering put into the design. Where flooding is only inches deep and of short duration, almost any barrier of concrete or earth will work. The most conservative cost estimate for a floodwall is based on a two foot high engineered cantilevered concrete floodwall. A cantilevered wall has a footing to provide stability and keep the water pressure from pushing it over. The budget shown in Table 3 is for a 40’x 40’ home with a wall one foot outside the building wall. Labor accounts for about half of the price in the cost estimate.
Table 3: Floodwall Cost Estimate

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Foot high reinforced concrete cantilever wall, 168 feet @ $200/foot</td>
<td>$33,600</td>
</tr>
<tr>
<td>Internal drainage and sump pump system</td>
<td>5,000</td>
</tr>
<tr>
<td>Sewer backup valve</td>
<td>4,500</td>
</tr>
<tr>
<td>Generator for power outages</td>
<td>900</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$44,000</strong></td>
</tr>
</tbody>
</table>

It should be noted that smaller, non-engineered walls such as the ones in Figures 6 and 7 have been built by their owners for less than $10,000. FEMA does not fund individual floodwalls for residential properties; therefore, the homeowner must pay 100% of the cost for a floodwall. However, each property owner can determine how much of their own labor they can to contribute and whether the cost of the wall is worth the protection from flooding that it provides.
III. Dry Floodproofing

This measure keeps floodwaters out of a building by steps taken to protect the building directly. Walls are coated with waterproofing compounds or plastic sheeting. Openings (doors, windows, and vents) are closed either permanently, or temporarily with removable shields or sandbags.

A floodproofing project has three components:

- 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 for the openings; including doors, windows, dryer vents and weep holes; such as removable shields or sandbags.
- Account for sewer backup and other sources of water entering the building. For shallow flood levels, this can be done with a floor drain; although a valve system is more secure.
As seen in Figure 9, 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 3 feet over the 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 University City area: those with slab foundations that typically receive floodwater up to three feet in the house. Eighty-nine percent of the houses in the analysis area are on slab foundations, and according to the data sheet responses seventy percent of the respondents experienced three feet of flooding.

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.

Examples of floodproofed houses can be seen in Figures 9 through 12.
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 not offer a lower insurance rate for dry floodproofed residences.

**A. 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. 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.

**B. 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 University City analysis area. It can also be more attractive than a floodwall around a house.

**IV. Higher Regulatory Standards**

The City of Kenner’s Flood Damage Reduction Ordinance (discussed on pages 8-9 of this report) meets the NFIP requirements for development regulations. There are higher regulatory standards that the City of Kenner could adopt to increase development regulations and help insure that flood losses are lessened. There are a variety of higher
regulatory standards that communities could adopt. This report reviews three that can have the greatest impact on protecting repetitively flood buildings: freeboard, cumulative substantial improvements/damage and enclosure limitations.

“Freeboard” can best be defined as a factor of safety usually expressed in feet above the Base Flood Elevation (BFE). Freeboard provides additional height above the BFE in order to afford homeowners additional protection from floodwaters, debris, and possible wave action. By requiring new construction and substantially improved buildings to elevate above the BFE, the City of Kenner would also be assisting homeowners in reducing their flood insurance premiums. Table 4 on the next page give example flood insurance premiums for homes elevated at different heights above the BFE.

A cumulative substantial damage/improvement standard states that for each time a structure is damaged and repaired, and/or renovated, the percentage of improvement to the structure is recorded and added to previous percentage of damage repairs and/or renovations. When the structure reaches the 50% NFIP threshold it must be brought into compliance with current flood and building codes. The benefit to homeowners is that structures in communities with cumulative substantial damage/improvement ordinances reach the 50% improved threshold sooner and thus qualify for Increased Cost of Compliance (ICC) payments sooner. ICC payments can be used for bringing a flood damaged structure into compliance with current codes. ICC payments are discussed in more detail on page 27 of this report.

Enclosure limitations can range from prohibiting any enclosed space below the lowest floor of living space, to requiring the homeowner to sign a non-conversion agreement promising not to improve, finish or otherwise convert appropriately enclosed space located below the lowest floor of living space. Enclosure limitations prevent owners of houses built over eight feet above the ground from converting an enclosed space below the lowest floor of living space into an illegal finished room. The community may decide to only enforce enclosure limitations for structures elevated five feet or more above the ground, as spaces less than five feet tall are not typically enough for finished rooms (the space is useable for storage, parking, etc.).

**VI. Flood Insurance**
Although not a mitigation measure that reduces property damage from a flood, a National Flood Insurance Program policy has the following advantages for the homeowner or renter:

- A flood insurance policy covers surface flooding from the overflow of inland or tidal waters or from storm water runoff.
- Flood insurance may be the only source of assistance to help owners of damaged property pay for cleanup and repairs.
- Once in effect there is no need for human intervention.\(^9\)
- Coverage is available for the contents of a home as well as for the structure.
- Renters can buy contents coverage, even if the building owner does not buy coverage for the structure itself.

**A. Cost:** Flood insurance rates are based on several factors including what flood zone the building falls in and the age of the structure. Generally, homes in the X zone have lower flood insurance rates than those in the Special Flood Hazard Area (SFHA), because the X zone indicates a lower risk from flooding. The homes in the study area fall in the A Zone.

Homes constructed before June 25\(^{th}\), 1971 in the City of Kenner are “pre-FIRM” buildings, which means that they were built before the date of the first FIRM for the community, and are thus eligible for the “subsidized” flood insurance premium rates.

A building that is located in the A flood zone and constructed or substantially improved after the date of the most current FIRM - such as one built or substantially improved in 2010 – is supposed to be built above the base flood elevation and is therefore subject to rates based on the actual risk rather than a subsidized rate. Rates on pre-FIRM buildings are subsidized because the flood risk was unknown at the time of construction.

<table>
<thead>
<tr>
<th>Table 4: Example NFIP Policy Premiums</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Policy/Building Exposure</strong></td>
</tr>
<tr>
<td>Pre-FIRM (&quot;subsidized&quot;) rate (AE zone)</td>
</tr>
<tr>
<td>Post-FIRM (actuarial) rates (AE zone)</td>
</tr>
<tr>
<td>2 feet above BFE</td>
</tr>
<tr>
<td>1 foot above BFE</td>
</tr>
<tr>
<td>At BFE</td>
</tr>
<tr>
<td>1 foot below BFE</td>
</tr>
<tr>
<td>X Zone</td>
</tr>
</tbody>
</table>

Annual premium is for $150,000 in building coverage and $60,000 in contents coverage for a one-story house with no basement and a $1,000 deductible. **Includes New Orleans’ CRS Class 8 benefit.**

May 1, 2010, *Flood Insurance Agent’s Manual*

Table 4 shows the rates for a policy with $150,000 coverage on the building. For example, a house that meets the BFE with a $150,000 building/$60,000 contents policy will cost the homeowner approximately $1,218 annually to insure. If a pre-FIRM house

\(^9\) There is a 30-day waiting period for a new flood insurance policy before it goes into effect.
in the SFHA is elevated to 1 foot above the BFE, the owner will be able to take advantage of the much lower post-FIRM rates, approximately $640 annually.

B. Community Rating System (CRS): The Community Rating System is a “voluntary incentive program that recognizes and encourages community floodplain activities that exceed the minimum National Flood Insurance Program (NFIP) requirements” (www.FEMA.gov). Participating communities are rewarded with reduced insurance premiums. The City of Kenner participates in the CRS and is currently rated as a Class 7, which gives all NFIP flood insurance policy holders in the Special Flood Hazard Area (SFHA) a 15% discount in their premium. Policy holders not in the SFHA receive a 5% discount on their premiums. University City is in a Zone A, which is in the SFHA. The table on the next page summarizes the mitigation measures discussed in this report.

VII. Funding

There are several possible sources of funding for mitigation projects:

A. FEMA programs: Most of the FEMA programs provide 75% of the cost of a project. The owner is expected to fund the other 25%. Each program has different Congressional authorization and slightly different rules. The most active program currently is the Hazard Mitigation Grant Program (HMGP). The City of Kenner uses the HMGP and the Severe Repetitive Loss (SRL) program for elevation and reconstruction projects. The Jefferson Parish Office of Emergency Management manages the applications process for the City of Kenner.

1. The Hazard Mitigation Grant Program (HMGP)\(^{10}\): 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.

2. The Severe Repetitive Loss Program (SRL)\(^{11}\): The Severe Repetitive Loss (SRL) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, to reduce or eliminate claims under the NFIP for those properties on the severe repetitive flood loss list. Eligible flood mitigation projects include

- Acquisition and demolition or relocation of structures that are listed on FEMA’s severe repetitive loss list and conversion of the property to open space
- Elevation of existing SRL structures to at least the Base Flood Elevation (BFE) or an Advisory Base Flood Elevation (ABFE) or higher.

\(^{10}\) For more information please visit [http://www.fema.gov/government/grant/hmgp/index.shtm](http://www.fema.gov/government/grant/hmgp/index.shtm)
\(^{11}\) For more information please visit [http://www.fema.gov/government/grant/srl/index.shtm](http://www.fema.gov/government/grant/srl/index.shtm)

University City RLAA
• For the SRL program only, mitigation reconstruction is permitted only when traditional elevation cannot be implemented.

Under the SRL program only, the Federal share of a project’s cost is up to 90%; the remaining 10% is to be paid by a non-Federal source, such as the homeowner. There is a new SRL ICC Pilot Program that can be used to cover the homeowner’s 10% of the cost share. That program is discussed under Flood Insurance on page 27 of this report.

3. 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. There are three grant types that are available under FMA:

- **Planning Grants** to prepare Flood Mitigation Plans. Only NFIP-participating communities with approved Flood Mitigation Plans can apply for FMA Project grants.
- **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.
- **Management Cost Grants** for the State to help administer the FMA program and activities. Up to ten percent (10%) of Project grants may be awarded to States for Management Cost Grants.

4. 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. There are several requirements that must be met in order to receive PDM funding. For more information please visit [http://www.fema.gov/government/grant/pdm/index.shtm](http://www.fema.gov/government/grant/pdm/index.shtm).

B. 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.

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 the insurance agent who

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wrote your flood insurance policy or visit

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
- The Structure must be located in an A Zone

1. **Severe Repetitive Loss ICC Pilot Program:** While the conventional ICC only
covers buildings that are located in the Special Flood Hazard Areas (SFHA), there
is a new pilot program that is aiming to target buildings **not** in the SFHA.
Focusing specifically on Severe Repetitive Loss (SRL) buildings, this pilot
program will offer ICC benefits to those SRL properties that are located in B, C,
or X flood zones – all of which are now considered “X zones” under the new
maps – and will include those SRL buildings that have grandfathered X zone
rates. Under this new pilot program, the ICC benefits could be used to cover the
homeowner’s 10% match in a SRL grant. This could be helpful to the 17 SRL
properties in the University City study area

C. **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 to finance the bulk of the
cost. The rebate acts more as an incentive, rather than as needed financial support. More
information on rebates can be found in the Corps of Engineers’ report Local Flood
Proofing Programs found at:

D. **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. Measures eligible for
SBA mitigation loans may only protect real estate property, not personal items, from the
same type of future declared disaster.
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. For more information on SBA mitigation loans, please contact disastercustomerservice@sba.gov.

**Step 4: Coordination**

Coordinating with relevant agencies, offices, and organizations is an important step in the analysis process. This step helps to open lines of communication among those interested in flood protection in the University City area and to see what other groups are addressing the area's flood problems.

The following agencies and organizations were contacted by the UNO-CHART team in order to complete this analysis report:

- FEMA Region VI, Mitigation Office
- LRO, Hazard Mitigation Office
- City of Kenner, Department of Inspection and Code Enforcement
- City of Kenner, GIS Department

<table>
<thead>
<tr>
<th>Measure</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevation</td>
<td>More secure flood protection</td>
<td>High cost</td>
</tr>
<tr>
<td></td>
<td>Flood insurance rate reduction</td>
<td>Need source of non-FEMA cost share</td>
</tr>
<tr>
<td>Floodwalls</td>
<td>Effective for shallow flooding</td>
<td>Subject to seepage if water stays up for a long time</td>
</tr>
<tr>
<td>Dry Floodproofing</td>
<td>Low cost</td>
<td>Exposes homes to wall/floor damage</td>
</tr>
<tr>
<td></td>
<td>Effective for shallow flooding on slab foundations</td>
<td></td>
</tr>
<tr>
<td>Higher Regulatory</td>
<td>Cumulative substantial damage/improvement</td>
<td>Enforcing enclosure limitations can be time</td>
</tr>
<tr>
<td>Standards</td>
<td>ordinance makes it easier for homeowners to</td>
<td>consuming</td>
</tr>
<tr>
<td></td>
<td>qualify for ICC funding</td>
<td></td>
</tr>
<tr>
<td>Flood Insurance</td>
<td>In effect as long as policy is renewed</td>
<td>Does not prevent flood damage (but does provide</td>
</tr>
<tr>
<td></td>
<td>Works for all flood levels</td>
<td>funds for repairs)</td>
</tr>
<tr>
<td></td>
<td>Under ICC, can be a source of funds for</td>
<td></td>
</tr>
<tr>
<td></td>
<td>elevation</td>
<td></td>
</tr>
</tbody>
</table>

University City RLAA
City of Kenner Public Works Department
Jefferson Parish Office of Emergency Management
University City Civic Association

Step 5: Findings and Recommendations

I. Findings

Flooding in the University City area is usually the result of a heavy rain event that overloads the drainage system of canals and pump stations in the area. This flooding can be worsened if there is loss of power at one or both of the pumping stations in the area: Duncan and the Parish Line pumping stations.

There are several mitigation measures that are available to homeowners in the study area. Elevation, dry floodproofing, and flood barriers are all measures that can be implemented on a house by house basis. Elevating a house above the flood hazard offers the most secure flood protection. Elevation is costly, especially for slab houses; however there are various funding mechanism that can be used by Kenner homeowners.

Dry floodproofing is another appropriate measure for slab houses in the University City area that do not experience flood depths over three feet. Dry floodproofing has the lowest cost of the three options (elevation, dry floodproofing, and flood barriers). Small personal floodwalls are effective for shallow flooding, and the soil types in the study area are conducive for a functioning barrier such as a small floodwall, although an engineer should be consulted. Neither small floodwalls nor dry floodproofing will protect University City area homes from flood depths greater than three feet.

Flood Insurance is always in effect and works for all flood levels. It will not prevent flood damage, but it will provide funds for repairs. The City of Kenner could explore alternative financing methods (such as a rebate program) to support flood mitigation projects such as dry floodproofing and building small floodwalls.

II. Recommendations

These recommendations are categorized first for the City of Kenner, and second for the University City homeowners.

A. For the City of Kenner:

- Explore alternative financing methods to support flood mitigation projects, such as the possibility of establishing a rebate program.
- Provide assistance with on-site mitigation projects through
  - Soils testing for homeowners who want to consider building a floodwall.
  - Encouraging property owners who are eligible for HMGP and SRL funding to pursue a mitigation measure.
• Take advantage of the new SRL ICC Pilot Program and alert SRL homeowner’s of its benefits
• Partner with the neighborhood, perhaps using it as a test area, for locally initiated mitigation options such as a rebate program.

B. For the University City area homeowners:

• Review the alternative mitigation measures discussed in this analysis and implement those that are most appropriate for their situations.
• Institute a drain maintenance program, or “adopt an inlet” that encourages homeowners to frequently clear their drains of debris to ensure open flow for rain waters.
• Purchase and maintain a flood insurance policy on the home and contents.
• Stay vigilant about new flood threats, such as development issues, and commit the neighborhood energy to studying and mitigating such threats.

Report References

• FEMA Region VI Repetitive Loss data
Appendix A: City Letter to the Residents of the University City Study Area
RE: University City Repetitive Flooding Project

Dear University City Resident:

The City of Kenner Inspection and Code Enforcement Department is reviewing ways to reduce some of our repetitive flooding problems. One opportunity we have identified is to partner with The University of New Orleans’ Center for Hazards Assessment, Response and Technology (CHART) to conduct a flood risk assessment in the University City area.

As part of this project, a team CHART is preparing an “area analysis” for the University City area. Information specific to your property needs to be collected in order to determine what can be done to protect homes in the area from flooding. CHART staff will be in the area during the week of June 1, 2010, collecting general information from the street such as the type of foundation and structure type of each home. They will also photograph each property in the study area, and may need to walk around the property, but there will be no need for them to enter your home.

This work would be greatly improved with additional data that you might be able to provide. Attached is a data sheet that we hope you will complete and return by May 17, 2010. After you fill the form out please fold it up, tape it, and mail it to the address listed on the flip side. A stamp has been provided.

After the analysis is completed, some preliminary recommendations will be developed and presented by the CHART team. You will receive another mailing alerting you to the date, time, and location of the presentation.

If you have any questions about this project, please feel free to call me at the City of Kenner Inspection and Code Enforcement Department at (504) 468-6606 or Erin Paiton at CHART, at (504) 280-1404.

Thank you for your assistance in helping us to complete this project.

Sincerely,

Keith Chiro
Floodplain Administrator/Director of Inspection & Code Enforcement
Attachment

Appendix B: Homeowner’s Data Sheet
University City Repetitive Flooding Analysis
Flood Protection Data Sheet

Name: ____________________________
Property address: ____________________________, Kenner, LA 70065

1. In what year did you move into the home at this address? ____________

2. What type of foundation does your house have?  
   □ Slab  □ Crawlspace (please answer #3)  
   □ Posts/piles (please answer #3)

3. If your house has a **crawlspace or post/piles foundation**, please indicate how high from grade your lowest floor of living space is. ________________

4. Has the property ever been flooded or had a water problem?  
   □ Yes  □ No (if “no,” please complete items 8 – 11)

5. In what year(s) did it flood?  
   __________________________________________

6. What was the deepest that the water got?  
   □ Over first floor: ________________ deep  
   □ In yard only: ________________ deep  
   □ Water kept out of house or building by sandbagging or other protective measure

7. What was the longest time that the water stayed up in the house? ___ hours or ___ days

8. What do you feel was the cause of your flooding? Check all that affect your building.  
   □ Overbank flooding from nearby bayou  
   □ Storm surge from nearby waterways  
   □ Clogged/undersized drainage ditch  
   □ Drainage from nearby properties  
   □ Storm sewer backup  
   □ Sanitary sewer backup  
   □ Standing water  
   □ Other: ____________________________

9. Have you taken any flood protection measures on your property?  
   □ Moved utilities/contents to a higher level  
   □ Elevated all or parts of the building  
   □ Regraded yard to keep water away from building  
   □ Waterproofed the outside walls  
   □ Installed drains or pipes to improved drainage  
   □ Built a wall to keep water away  
   □ Sandbagged when water threatened  
   □ Other: ____________________________

10. Did any of the measures checked in item 9 work? If so, which ones? If not, do you know why they didn’t work? □ Yes  □ No

11. Do you have Flood Insurance?  
   □ Yes  □ No

12. Are you interested in pursuing measures to protect the property from flooding?  
   □ Yes  □ No  If yes, please include your full mailing address below: ____________________________
## Appendix C: Data Sheet Results

<table>
<thead>
<tr>
<th>Total Respondents: 42</th>
<th>%*</th>
<th>Answer</th>
<th>Number out of 42</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>In what year did you move to the home at this address</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.5%</td>
<td>No response</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>28.5%</td>
<td>1970-1980</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>16.6%</td>
<td>1981-1990</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>19.3%</td>
<td>1991-2000</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>26.2%</td>
<td>2001-2010</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td><strong>What type of foundation does your house have</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>88%</td>
<td>Slab</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td>Crawlspacet</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7%</td>
<td>Combination</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>If your house has a crawlspacet or post/piles foundation, please indicate how high from grade your lowest floor of living space is.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4%</td>
<td>Less than 1 foot</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11.9%</td>
<td>3 feet</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td><strong>Has the property ever been flooded or have a water problem</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>95%</td>
<td>Yes</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td>No</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>In what years did it flood</strong> <em>(multiple answers were allowed)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td>1978</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4%</td>
<td>1980</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7%</td>
<td>1983</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td>1986</td>
<td>1</td>
<td></td>
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<tr>
<td>2%</td>
<td>1991</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td>1993</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12%</td>
<td>1995</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td>2002</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td>2003</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>93%</td>
<td>2005</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td>2006</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4%</td>
<td>N/A</td>
<td>2</td>
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</tr>
<tr>
<td><strong>What was the deepest the water ever got</strong> <em>(multiple answers were allowed)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52.3%</td>
<td>0-2 ft House</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>28.5%</td>
<td>3-6 ft House</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>4%</td>
<td>0-2 ft Yard</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td>3-6 ft Yard</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td>No response</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>What was the longest time that the water stayed in the house</strong> <em>(multiple answers were allowed)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td>12-24 hours</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>26%</td>
<td>2-3 days</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>17%</td>
<td>4-5 days</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>17%</td>
<td>&gt;5 days</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>36%</td>
<td>N/A</td>
<td>15</td>
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* May not equal 100% due to rounding
Appendix C: Data Sheet Results (Continued from previous page)

<table>
<thead>
<tr>
<th>Total Respondents: 42</th>
<th>%*</th>
<th>Answer</th>
<th>Number out of 42</th>
</tr>
</thead>
<tbody>
<tr>
<td>19%</td>
<td>Overbank flooding</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>35%</td>
<td>Storm Surge</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>14%</td>
<td>Clogged/undersized drainage ditch(es)</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>12%</td>
<td>Drainage from nearby properties</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>21%</td>
<td>Storm sewer backup</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td>Sanitary sewer backup</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td>Standing water next to house</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>71%</td>
<td>Other:</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>47%</td>
<td>Pumps not working/shut off</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>14%</td>
<td>Hurricane Katrina</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td>Area is old/low elevation</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td>Heavy rain</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td>No drainage in the area</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td>No Answer</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>28.5%</td>
<td>Moved Utilities/contents higher</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>14%</td>
<td>Elevated some or all parts of the house</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>12%</td>
<td>Regraded yard</td>
<td>5</td>
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</tr>
<tr>
<td>0%</td>
<td>Waterproofed the outside walls</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>0%</td>
<td>Installed drains/pipes to improve drainage</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>0%</td>
<td>Built a wall to keep water away</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>4%</td>
<td>Sandbagged when water threatened</td>
<td>2</td>
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</tr>
<tr>
<td>16%</td>
<td>Other:</td>
<td>7</td>
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</tr>
<tr>
<td>12%</td>
<td>Plan to elevate/in the process</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td>New owner</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td>Got rid of Aaron Broussard</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td>Installed tile throughout the house</td>
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<tr>
<td>2%</td>
<td>No</td>
<td>1</td>
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<tr>
<td>31%</td>
<td>No answer</td>
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<td></td>
</tr>
<tr>
<td>98%</td>
<td>Yes</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td>No</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>81%</td>
<td>Yes</td>
<td>34</td>
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<tr>
<td>19%</td>
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# Appendix D: Windshield Data

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<th>Percentage</th>
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<tr>
<td>Occupied</td>
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</tr>
<tr>
<td>Foundation type</td>
<td></td>
<td></td>
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<tr>
<td>Slab</td>
<td>89.31%</td>
<td></td>
</tr>
<tr>
<td>Crawlspace</td>
<td>9.92%</td>
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</tr>
<tr>
<td>Piles/Piers/Mix</td>
<td>0.76%</td>
<td></td>
</tr>
<tr>
<td>Foundation Condition</td>
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<td></td>
</tr>
<tr>
<td>Good</td>
<td>98%</td>
<td></td>
</tr>
<tr>
<td>Fair</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Structure Type</td>
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<td></td>
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<tr>
<td>Masonry</td>
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</tr>
<tr>
<td>Wood Frame</td>
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<td>Good</td>
<td>98%</td>
<td></td>
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<tr>
<td>Fair</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Number of Stories</td>
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<td></td>
</tr>
<tr>
<td>1 Story Home</td>
<td>98.5%</td>
<td></td>
</tr>
<tr>
<td>1 ½ Story Home</td>
<td>1.5%</td>
<td></td>
</tr>
<tr>
<td>Height Above Grade</td>
<td></td>
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<tr>
<td>0-1 Feet</td>
<td>96%</td>
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<td>1%</td>
<td></td>
</tr>
<tr>
<td>2-3 Feet</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>3-4 Feet</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Fill Above Street</td>
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</tr>
<tr>
<td>0-1 Feet</td>
<td>74.43%</td>
<td></td>
</tr>
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<td>1-2 Feet</td>
<td>23.23%</td>
<td></td>
</tr>
<tr>
<td>2-3 Feet</td>
<td>1.5%</td>
<td></td>
</tr>
<tr>
<td>3-4 Feet</td>
<td>0.76%</td>
<td></td>
</tr>
</tbody>
</table>

*Percentages may not equal 100% due to rounding*

---

# Appendix E: the City of Kenner’s Mitigation Goals
**Goal #1** “Identify and pursue preventative measures that will reduce future damages from hazards” has one action item that has been completed. That action item is:

- Conduct a review of the existing pump capacity data and determine the best method of increasing pumping volume at Pump Station No. 4 Duncan and No. 5 Parish Line. **Benefits: reduces the number of flooded structures by increasing the volume of water the pumps can handle.**
  - Lead Manager: Department of Public Works
  - Cost: $100,000
  - Schedule: December 2006
  - Hazard: Hurricanes and Flooding
  - Funding: City and Parish Budget
  - Status: Completed, engineering/design underway.

**Goal #2** “Enhance public awareness and understanding of disaster preparedness” has two action items listed; one that is ongoing, and one that occurs on an annual basis. Those action items are:

- Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the NFIP. **Benefits: enables homeowners to financially recover from the devastating effects of flooding as rapidly as possible.**
  - Lead Manager: Parish & City Floodplain Managers/Planning Director/Building Inspector/Inspection and Code Director
  - Cost: $5,000
  - Schedule: March 2006
  - Hazard: Floods
  - Funding: Parish and City Budgets
  - Status: Ongoing. City does this annually through various outreach programs

- Participate with Parish to sponsor a “Multi-Hazards Awareness Week” to educate the public on hurricanes and tornadoes, floods, and thunderstorms/lighting/high winds. **Benefits: To reduce the loss of life and property by having an educated citizenry.**
  - Lead Manager: Mayors and GOHSEP Director
  - Cost: $10,000
  - Schedule: December 2006
  - Hazard: Hurricanes, Floods, and Tornadoes
  - Funding: Parish and City Budgets, Business and Industry
  - Status: Done on an annual basis
Goal # 3 “Reduce repetitive flood losses in the City by pursuing various mitigation measures (elevations and floodproofing)” has one action item that is ongoing:

- Pursue elevation/floodproofing projects and structural solutions to flooding for repetitive loss (RL) and severe repetitive loss (SRL) properties. **Benefits:** removing structures from the floodplain, homeowners suffer less displacement days and flood damage. The drain on the NFIP is reduced by a decrease in flood claims. By correcting the Repetitive Loss List, the Parish will be better able to determine those structures needing elevation/acquisition/and floodproofing projects.
  - Lead Manager: Parish and City Floodplain Managers
  - Cost: $500,000
  - Schedule: December 2006
  - Hazard: Hurricanes and Floods
  - Funding: Hazard Mitigation Grant Program (HMGP) funds, Flood Mitigation Assistance (FMA) Project funds, Pre Disaster Mitigation (PDM) funds, City Budget
  - Status: Since Katrina, thirty-three (33) RL properties have been approved for elevation/reconstruction through HMGP

Goal # 4 “Facilitate sound development in the City so as to reduce or eliminate the potential impact of hazard” has three action items that are in various stages:

- Install roll down type hurricane shutters at all seven fire stations and at Headquarters. **Benefits:** Protect the fire stations from damages (during a hurricane).
  - Lead Manager: City of Kenner Fire Department
  - Cost: $225,000
  - Schedule: December 2006
  - Hazard: Hurricane and Floods
  - Funding: City Budget
  - Status: Revised – new project is wind retrofit for City Hall B & C, police HQ and Fire Station 37 – projects scoped funding being sought

- Upgrade the back-up power supply/generators at Fire Station No. 37, 38, and 39. **Benefits:** Provide source of electric power during power outages to continue essential operations
  - Lead Manager: Parish OEM Director/City of Kenner Fire Department
  - Cost: $110,000
  - Schedule: December 2006
  - Hazard: Hurricanes, Floods, and Tornadoes
  - Funding: Parish and City Budgets
  - Status: Completed for FS Nos. 38 and 39, funding needed got FS No. 37