



HARRIS COUNTY DAMAGE ASSESSMENT

Helping Harris County Communities
Recover from Hurricane Ike

February 2009





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Executive Summary

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Executive Summary

On September 13, 2008, Hurricane Ike made landfall along the upper Texas gulf-coast. Hurricane Ike was the third most destructive hurricane to ever make landfall in the United States and the third costliest U.S. hurricane of all time, behind Hurricane Andrew of 1992 and Hurricane Katrina of 2005. Ike, a Category 2 Hurricane with maximum sustained winds of 110 mph, covered over 425 miles of Texas coastline. Harris County took a direct hit with the eye of the storm passing over Galveston Bay. Since this date, Harris County has admirably provided quick responses in the recovery and rebuilding efforts. Sensing the urgency for planning not only for immediate needs but also long-term recovery, and the impending flow of federal funds to stimulate recovery, Harris County embarked on the ambitious goal of cataloging and defining both the estimates of total damages from the storm, and cost estimates of the unmet needs. Urgency in the response and rebuilding after a hurricane must be balanced with informed decisions. The following report entitled HARRIS COUNTY DAMAGE ASSESSMENT (Helping Harris County Communities Recover from Hurricane Ike) serves as a resource to further refine and direct our recovery efforts to meet the needs of our residents. This report provides a summary of these findings and also serves as a metric for the needs required to further prepare Harris County communities for the planning and implementation of short and long-term recovery efforts.

This report was prepared with input from many of the communities and departments in Harris County. We would like to thank those communities and departments for assisting in the preparation and planning of the region's needs for rebuilding our communities toward the future. The report is summarized with similar structure as the Texas Rebounds Report released by Governor Rick Perry on November 10, 2008. In this fashion, Harris County damages by category are similar and consistent to those preliminary damage assessment costs estimated by the Texas Rebounds report conducted just 45 days after the storm.

This study captures as much data as possible from the unincorporated areas in Harris County plus every incorporated area except the City of Houston. These participating communities were canvassed for information regarding repair estimates from storm damage, hazard mitigation options, economic losses of businesses, and public services needs with the ultimate goal of calculating unmet needs of Harris County.

As noted earlier, Hurricane Ike was one of the costliest storms in recent years with a projected cost of \$3.58 billion in residential housing damage in Harris County, excluding the city of Houston. As shown on Table 3.1, Harris County has a total of more than 532,374 residential units (single family, multi-family, and mobile home). Of the total units, about 230,502 or 43.3 percent, experienced damage ranging from affected to destroyed. As reported in the Hurricane Ike Impact report developed by the State of Texas, Division of Emergency Management, an average of 27% of the wind damaged homes were uninsured and an average of 61% of the flood damages were uninsured. Total projected housing damage for unincorporated Harris County is estimated at \$2.37 billion with expected funding of \$2.11 billion from FEMA and other sources. This leaves a gap or "unmet need" of \$261 million to be addressed in order to provide the necessary financial assistance to the residents of Harris County that was impacted by Hurricane Ike. Additionally, projected housing damage for incorporated Harris County is estimated at \$1.2 billion with an estimated \$1.07 billion in funding expected to be received from FEMA and other sources, leaving a gap or "unmet need" of \$132 million. This creates a total unmet housing need for Harris County of \$394 million.



Infrastructure within Harris County was significantly impacted by Hurricane Ike, resulting in almost \$582 million in infrastructure repairs necessary for long term recovery. Critical Infrastructure such as buildings, water, sewer, drainage, generators and equipment, Utility Infrastructure, Transportation, and Navigation and Waterways Infrastructure projects were tabulated based on input received from various communities and other entities within Harris County. Based on the Projects Worksheets that have been written as of this report, it is anticipated that Harris County will have unmet infrastructure needs of approximately \$499 million. Of the damage that was categorized as caused by wind, flood, or surge, approximately 53% was attributed to wind, 34% to surge, and the remainder to flood.

Economic Development was identified as an additional disaster recovery area with unmet needs. Based on a limited survey of businesses primarily located in the surge zone within Harris County, seventy-five percent (75%) of losses reported were due to inventory losses and 20% were due to physical damage. Based on the returned surveys, there is an anticipated unmet financial need of \$45 million. It is clear, from the findings of the survey that the unmet needs are likely greater than this amount since these estimated unmet needs are based on a limited survey sample.

Public Services were severely hampered due to the increased services that were necessary to provide for evacuees, at a time when many of their buildings housing those services were damaged or destroyed. It is estimated that there was over \$419 million of damages to public services that will leave a gap of unmet needs of over \$346 million.

During all of the site visits made to Harris County communities, it was evident that Hazard Mitigation is a top priority. Hazard mitigation breaks the recurrent reconstruction cycle. When recurrent disasters take place, such as hurricanes, repeated damage and reconstruction occurs. This is often more expensive as the years go by. It is very important to a community's revitalization to build stronger, safer and smarter to eliminate long term risks caused by disasters in order to reduce future injuries and future damage. Hazard Mitigation dollars will be very limited in Texas. The funds that are allocated to the State of Texas for hazard mitigation activities will be awarded on competitive bases statewide. The study shows that there is a need for \$1.5 billion for mitigation activities for infrastructure, \$21.8 million for economic development mitigation, \$36.4 million for social service mitigation and \$81.8 million for mental health mitigation needs. Hazard mitigation is needed to break this repetitive cycle by producing less vulnerable conditions through post-disaster repairs and reconstruction.

At the end of this section there are three summary tables. **Summary Table ES-1** illustrates the total costs of damages for Housing, Infrastructure, Economic Development, Public Services and Hazard Mitigation needs. **Summary Table ES-2** illustrates the anticipated FEMA and other funding for the damages listed in the categories above and **Summary Table ES-3** illustrates the anticipated unmet needs for those categories.



Harris County Total Damages by Jurisdiction	Harris County Governments	Incorporated	Unincorporated	Authority	Total
Housing Assistance		\$1,207,218,838	\$2,372,883,040		\$3,580,101,878
Infrastructure					
Critical Infrastructure	\$61,740,434	\$159,860,446	\$76,809	\$93,969,135	\$315,646,824
Transportation	\$3,390,625	\$533,359	\$0	\$99,869,750	\$103,793,734
Navigation and Waterways	\$0	\$8,351,832	\$0	\$63,660,113	\$72,011,945
Utility Infrastructure	\$130,000	\$20,205	\$0	\$25,090,151	\$25,240,356
Educational Facilities	\$65,799,255				\$65,799,255
Subtotal	\$131,060,314	\$168,765,842	\$76,809	\$282,589,149	\$582,492,114
Economic Development					\$61,005,230
Public Services					
Social Services					\$260,228,469
Health Care and Mental Health Services					\$159,203,593
Subtotal					\$419,432,062
TOTAL DAMAGE	\$131,060,314	\$1,375,984,680	\$2,372,959,849	\$282,589,149	\$4,643,031,284
Hazard Mitigation Infrastructure	\$818,301,674	\$387,956,545	\$140,384,693	\$174,816,935	\$1,521,459,847
Hazard Mitigation Economic Development					\$21,824,500
Hazard Mitigation Social Services					\$36,430,402
Hazard Mitigation Mental Health					\$81,801,538
Special Needs Housing					\$81,750,000
TOTAL HAZARD MITIGATION	\$818,301,674	\$387,956,545	\$140,384,693	\$174,816,935	\$1,743,266,287
GRAND TOTAL DAMAGES AND HAZARD MITIGATION	\$949,361,988	\$1,763,941,225	\$2,513,344,542	\$457,406,084	\$6,164,491,132

Table ES-1
Harris County Total Damages by Jurisdiction



Harris County Expected FEMA and Other Funding by Jurisdiction	Harris County Governments	Incorporated	Unincorporated	Authority	Total
Housing Assistance		\$1,074,287,426	\$2,111,595,954		\$3,185,883,380
Infrastructure					
Critical Infrastructure	\$45,035,814	\$9,664,570	\$0	\$0	\$54,700,383
Transportation	\$87,127	\$14,339	\$0	\$0	\$101,466
Navigation and Waterways	\$0	\$245,977	\$0	\$0	\$245,977
Utility Infrastructure	\$0	\$15,154	\$0	\$0	\$15,154
Educational Facilities	\$27,741,925				\$27,741,925
Subtotal	\$72,864,865	\$9,940,040	\$0	\$0	\$82,804,905
Economic Development					\$15,534,130
Public Services					
Social Services					\$3,024,000
Health Care and Mental Health Services					\$69,714,386
Subtotal					\$72,738,386
TOTAL DAMAGE	\$72,864,865	\$1,084,227,466	\$2,111,595,954	\$0	\$3,356,960,801
Hazard Mitigation Infrastructure	\$0	\$0	\$0	\$0	\$0
Hazard Mitigation Economic Development					\$0
Hazard Mitigation Social Services					\$0
Hazard Mitigation Mental Health					\$0
Special Needs Housing					\$0
TOTAL HAZARD MITIGATION	\$0	\$0	\$0	\$0	\$0
GRAND TOTAL DAMAGES AND HAZARD MITIGATION	\$72,864,865	\$1,084,227,466	\$2,111,595,954	\$0	\$3,356,960,801

Table ES-2
Harris County Expected FEMA and Other Funding by Jurisdiction



Harris County Unmet Needs by Jurisdiction	Harris County	Incorporated Harris County	Unincorporated Harris County	Authorities	Total
Housing Assistance	\$0	\$132,931,412	\$261,287,086	\$0	\$394,218,498
Infrastructure					
Critical Infrastructure	\$16,704,621	\$150,195,876	\$76,809	\$93,969,135	\$260,946,441
Transportation	\$3,303,498	\$519,020	\$0	\$99,869,750	\$103,692,268
Navigation and Waterways	\$0	\$8,105,855	\$0	\$63,660,113	\$71,765,968
Utility Infrastructure	\$130,000	\$5,051	\$0	\$25,090,151	\$25,225,202
Educational Facilities	\$38,057,330	\$0	\$0	\$0	\$38,057,330
Subtotal	\$58,195,449	\$158,825,803	\$76,809	\$282,589,149	\$499,687,210
Economic Development					\$45,471,100
Public Services					
Social Services					\$257,204,469
Health Care and Mental Health Services					\$89,489,207
Subtotal					\$346,693,676
TOTAL DAMAGE	\$58,195,449	\$291,757,215	\$261,363,895	\$282,589,149	\$1,286,070,484
Hazard Mitigation Infrastructure	\$818,301,674	\$387,956,545	\$140,384,693	\$174,816,935	\$1,521,459,847
Hazard Mitigation Economic Development					\$21,824,500
Hazard Mitigation Social Services					\$36,430,402
Hazard Mitigation Mental Health					\$81,801,538
Special Needs Housing					\$81,750,000
TOTAL HAZARD MITIGATION	\$818,301,674	\$387,956,545	\$140,384,693	\$174,816,935	\$1,743,266,287
GRAND TOTAL DAMAGES AND HAZARD MITIGATION	\$876,497,123	\$679,713,760	\$401,748,588	\$457,406,084	\$3,029,336,771

Table ES-3
Harris County Unmet Needs by Jurisdiction





Harris County Elected Officials

Harris County Judge
Judge Ed Emmett

Harris County Precinct No. 1
Commissioner El Franco Lee

Harris County Precinct No. 2
Commissioner Sylvia R. Garcia

Harris County Precinct No. 3
Commissioner Steve Radack

Harris County Precinct No. 4
Commissioner Jerry Eversole

Acknowledgements

Harris County would like to acknowledge the tremendous efforts and resources put forth by the numerous surrounding communities to complete the information gathering and data verification necessary to compile this report. In addition, we would like to thank the various internal County departments for their assistance.

Harris County

David B. Turkel Director, Community Services

Art Storey, P.E., Executive Director of Public Infrastructure Department

John R. Blount P.E., Director, Public Infrastructure Department

Raymond J. Anderson P.E., Deputy Director, Public Infrastructure Department

Harris County Housing Authority (HCHA)

Guy Rankin, CEO and Executive Director

McConnell Jones Lanier & Murphy LLP

Task Force Leaders

Susan Elkins-CDM Consulting and Engineering

Jessica Poole-Greater Houston Partnership

Linda O'Black-United Way

Coletta Castleschoudt-Bay Area Transportation Partnership

Lucretia Hammond-H-GAC Worksource

Jesus Arnezeua-Harris County Dept of Education

Gayla Rawlinson-Harris County Dept of Education

Karen Love-Harris County Healthcare Alliance

Cities, Authorities, Precincts and Agencies

City of Baytown	City of Taylor Lake Village
City of Bellaire	City of Tomball
Bunker Hill Village	City of Waller
City of Deer Park	City of Webster
City of El Lago	City of West University Place
City of Friendswood	Port of Houston
City of Galena Park	Clear Lake Water Authority
City of Hedwig Village	Numerous Municipal, Public and Special
City of Hilshire Village	Utility Districts
City of Humble	Harris County Precincts
City of Hunters Creek Village	Harris County Flood Control
City of Jacinto City	Harris County Sheriff's Office
City of Jersey Village	Harris County Constable's Offices
City of LaPorte	Alief ISD
City of League City	Aldine ISD
City of Missouri City	Clear Creek ISD
City of Morgan's Point	Cypress-Fairbanks ISD
City of Katy	Galena Park ISD
City of Nassau Bay	Goose Creek ISD
City of Pasadena	Harris County Department of Education
City of Pearland	Houston ISD
City of Piney Point Village	Huffman ISD
City of Seabrook	Humble ISD
City of Shoreacres	Klein ISD
City of South Houston	La Porte ISD
City of Southside Place	North Forest ISD
City of Spring Valley Village	Pasadena ISD
City of Stafford	Spring Branch ISD

1

Introduction

1.1 Hurricane Ike's Toll on Harris County

Hurricane Ike was the third most destructive hurricane to ever make landfall in the United States and the third costliest U.S. hurricane of all time, behind Hurricane Andrew of 1992 and Hurricane Katrina of 2005. On September 13, 2008, Ike made landfall along the upper Texas coast. Ike, a Category 2 Hurricane with maximum sustained winds of 110 mph, covered over 425 miles of Texas coastline. Harris County took a direct hit with the eye of the storm passing over Galveston Bay.

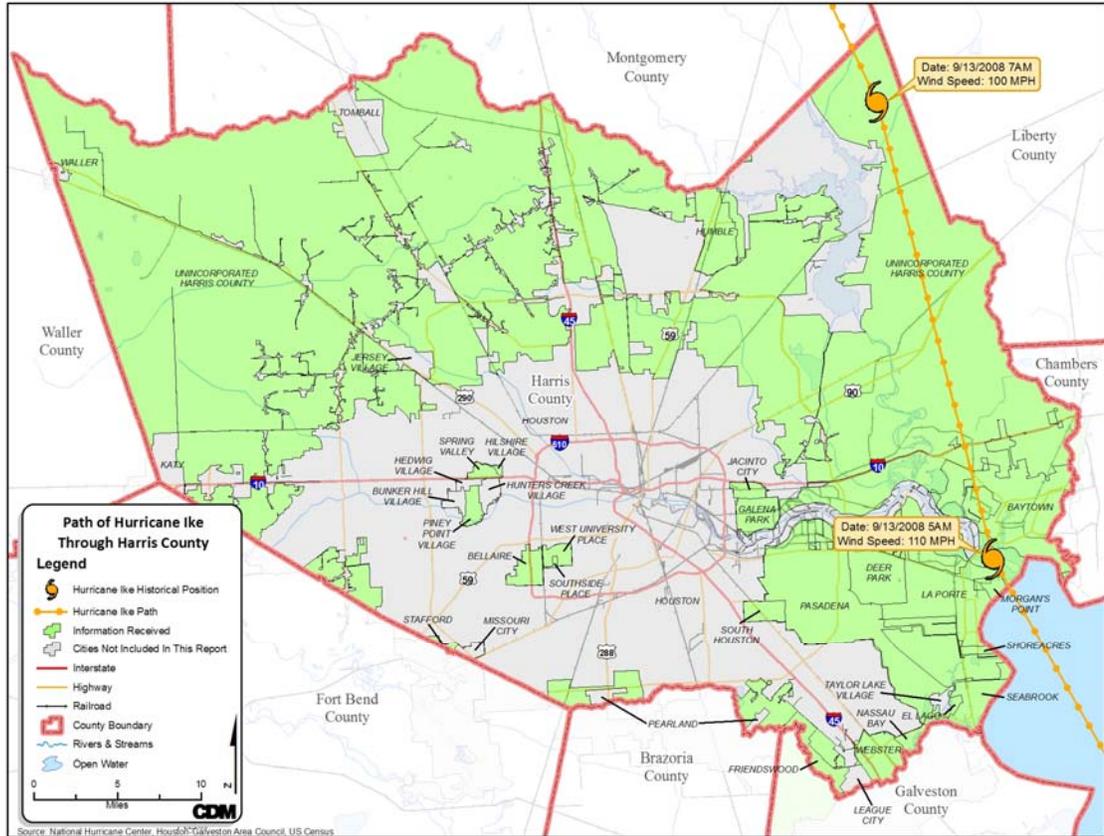


Figure 1-1
Path of Hurricane Ike Through Harris County

Today, the most noticeable evidence of Hurricane Ike's presence is the large amount of housing, building and infrastructure damage. The initial recovery process began with large scale debris removal operations and quickly moved into emergency repair operations for critical infrastructure such as communications, potable water, wastewater treatment, and transportation systems. In Harris County, many government buildings and other public infrastructure suffered severe damage causing interruptions in vital government services that were already strained due to the high demand from affected residents. Numerous Harris County coastal communities suffered severe damage and loss of personal property resulting in significant displacement of residents.



Permanent and severe damages have also been documented in various segments of public infrastructure including:

- ▼ Water and wastewater treatment systems
- ▼ Vehicular roadways
- ▼ Navigable waterways
- ▼ Utilities
- ▼ Educational facilities

Notwithstanding the severe damage to housing and critical infrastructure, Hurricane Ike has created a much greater need to provide social and public health services to local residents. This strain is further compounded by the fact that local shelters and community centers were damaged by the storm, many of which are still not functioning at pre-storm capabilities.

The will of Harris County residents to rebuild and get on with their lives is stronger than ever. However, the severe economic conditions being experienced across the country are exacerbating the ability of businesses to rebuild and re-employ after the storm, necessitating sustained economic development stimulus, and housing and infrastructure assistance.

1.2 Scope and Purpose

The purpose of this report is to document the unmet economic needs of Harris County and surrounding communities within Harris County as a direct result of Hurricane Ike. One of the largest and most important tasks of recovery is identifying, documenting, and reporting the costs of all damages incurred by the storms. Resources are scarce, yet timeliness is critical. It is equally important to identify the impact of those damages to the communities and its residents. In December 2008, the Governor's Commission for Disaster Recovery and Renewal conducted a preliminary assessment of damages incurred by Hurricane Ike. From that assessment, a report titled "*Texas Rebounds*" was issued, which outlined Texas' funding needs for recovery. Following this effort led by Governor Perry, Harris County took the initiative of contacting all the communities within its boundaries (excluding the City of Houston) in order to provide a more in-depth report of the needs within Harris County. The resulting Harris County Damage Assessment was conceived and commissioned as a joint effort between the Harris County Community Services Department and the Harris County Public Infrastructure Department.

1.3 Data Collection

1.3.1 Housing

All housing data presented in this report (unless specifically stated otherwise) was obtained from the Residential Damage Assessment Report published by the Harris County Housing Authority (HCHA), dated December 2008. Unmet housing needs were based on FEMA data and did not originate from the Residential Damage Assessment Report.

1.3.1.1 Planning and Initiating Housing Inspections

Within two days after Hurricane Ike made landfall (September 15, 2008), Harris County initiated planning to conduct residential damage assessments. The following activities were performed:



- ▼ Flew four sorties with the Harris County Civil Air Patrol (CAP) to photograph images of devastation from Hurricane Ike to prioritize the deployment of inspection teams.
- ▼ Used Harris County Office of Emergency Management's (HCOEM) "Annex J" standards to develop inspection forms to ensure uniform data collection. HCOEM's "Annex J" establishes Overall Damage Levels (ODL) and outlines specific criteria to be used for each damage level to assess damage to residential housing units. There are five damage levels ranging from "Level 0 – No Damage" to "Level 4 – Destroyed," with percent damage ranges of one to 25 percent per ODL beginning with "Level 1 – Affected." The distinct ODL values allowed inspectors a consistent, standards based method for assigning damage levels to residential units throughout Harris County.
- ▼ Defined geographic boundaries by city, zip code, county precinct, congressional district and census tract, to serve as "containers" to group unique sets of inspection data to be summarized and reported when estimating total damage values.
- ▼ Identified critical data sources essential to calculating estimated damage values including the Harris County Appraisal District (HCAD), which were used as the basis for establishing residential property values. HCAD's database contains "improvement" property values for all single family, multi-family and mobile home family units within the County. It is important to note, HCAD's database of improvement values exclude land values, so only "true construction" values are considered, which is critical in projecting an accurate estimate of damage. Also noteworthy, is a residential unit is defined as a single taxable property independent of its categorization as a multi-family property. For example, an apartment unit that has 100 apartments serving as housing units for 100 households is still counted as only one unit on the tax rolls.
- ▼ Used LJA Engineering & Surveying, Inc. (LJA) for all geographic information support (GIS) required to map damage assessment results and develop models for estimating damage values within geographic boundaries using data provided by HCAD and other relevant data sources such as Key Map, Inc. and Houston Galveston Area Council STAR*MAP.
- ▼ Trained inspection teams using U. S. Department of Housing and Urban Development Housing Quality Standards to ensure a consistent knowledge base among inspection teams, as well as, an acceptable minimum standard for health and safety.

1.3.1.2 Selecting and Refining the Sample Size

The inspection housing team partnered with Rice University statisticians to define and select the sample size required for the study. The goal of the assessment was to provide a confidence level of at least 95 percent with an error rate of +/- 1 percent. This exceeds the industry standard of +/- 5 percent. Accordingly, the inspection team ran a GIS model that divided Harris County into residential units by Key Map square. This provided Rice University statisticians the number of residential units and square mileage of improved residential property within each Key Map square to "isolate" the exact number of residential housing units within each square. This Key Map square served as the common element area for determining the initial sample size.

Using this data, Rice University statisticians calculated sample size scenarios for the number of completed inspections in each Key Map square to ensure confidence levels and corresponding error



rates ranging from 95 percent confidence to 99 percent confidence with an error rate of +/- 1 percent. The inspection team chose the sample size scenario for Harris County that would yield 95 percent confidence with the error rate for our damage assessment inspection results being +/- 1 percent; thereby, yielding an initial sample size of 520,989 residential housing units out of 994,022 total residential housing units within Harris County.

Based on conditions encountered in the field while conducting inspections, the initial sample size was refined to consider potential spatial disparities within common residential areas in each Key Map square. Rice University statisticians were consulted to establish definitive criteria for spatial sampling requirements based on residential density. More specifically, the overall sample within a common residential area had to be adjusted for residential density to ensure that an “evenly distributed” damage assessment was performed, rather than a damage assessment disproportionately skewed toward areas of dense inspections within the grid which would result in an erroneous conclusion.

After refining the sample size, inspection teams completed approximately 774,000 actual physical inspections, resulting in a 99 percent confidence level that the error rate was +/- 1 percent; thereby, exceeding the initial goal of 95 percent confidence that the error rate was +/- 1 percent.

1.3.1.3 Conducting Damage Assessment Inspections

Harris County was divided into eight quadrants with eight inspection teams, comprised of 200 inspectors who conducted door-to-door residential housing damage inspections. Using Harris County Office of Emergency Management (HCOEM) “Annex J” standards, each housing unit was assigned a numeric Overall Damage Level (ODL) from “Level 0” to “Level 4,” with “Level 0” meaning the unit suffered no damage in the storm and “Level 4” meaning the storm completely destroyed the unit and it could not be salvaged. Housing units that scored a “Level 3” or “Level 4” are considered uninhabitable; however, units that score a “Level 3” are considered repairable. “Annex J” standards define the procedures required for local government and citizens to recover from a major disaster, including meeting state and federal record-keeping requirements, in order to be reimbursed for damages and emergency expenditures.

During the first three weeks, inspectors initially used a standard inspection form containing OEM “Annex J” standards to manually record inspection data. Beginning in week four, Tablet PCs were used, programmed with electronic inspection forms, including attributes identical to those in the manual form, to record the results of each inspection, which enabled the inspectors to upload daily inspection results into a common database to facilitate data manipulation and analysis during the reporting process.

Team leads coordinated and monitored inspection teams daily within each quadrant, conducting regular, random quality assurance inspections to ensure compliance with training standards and that they met the sample size requirements for actual completed inspections within each Key Map square.

1.3.1.4 Developing Extrapolation Model to Estimate Residential Damage

The inspection teams completed approximately 774,000 physical inspections out of the approximately 994,000 residential units within Harris County which included the City of Houston. Accordingly, this extrapolation model was used to assign ODL values to the remaining 220,000 uninspected residential units, which enabled the inspection team to calculate projected damage values, identify affected households within Harris County and report estimated damage assessment values, based on municipal and other political boundaries.



1.3.1.5 Calculating Damage Percentage and Estimating Damage Cost

The physical inspection and extrapolation processes assigned ODL values to all of the approximately 994,000 residential units within Harris County. Accordingly, the percentage damage ranges by ODL were used as the basis for calculating damage percentages. The damage percentage ranges by ODL are listed below:

Overall Damage Level (ODL)	Description	Damage Percentage Range
Level 0	No Damage	0%
Level 1	Affected	0% – 25%
Level 2	Minor	26% – 50%
Level 3	Major	51% – 75%
Level 4	Destroyed	76% –100%

Source: Harris County Public Infrastructure Department (HCPID)

Table 1-1
Damage Percentage Ranges by ODL

HCAD Improvement Value x Damage Percentage = Estimated Cost of Damage

Harris County Total Damages by Jurisdiction	Harris County Governments	Incorporated	Unincorporated	Authority	Total
Housing Assistance		\$1,207,218,838	\$2,372,883,040		\$3,580,101,878
Infrastructure					
Critical Infrastructure	\$61,740,434	\$159,860,446	\$76,809	\$93,969,135	\$315,646,824
Transportation	\$3,390,625	\$533,359	\$0	\$99,869,750	\$103,793,734
Navigation and Waterways	\$0	\$8,351,832	\$0	\$63,660,113	\$72,011,945
Utility Infrastructure	\$130,000	\$20,205	\$0	\$25,090,151	\$25,240,356
Educational Facilities	\$65,799,255				\$65,799,255
Subtotal	\$131,060,314	\$168,765,842	\$76,809	\$282,589,149	\$582,492,114
Economic Development					\$61,005,230
Public Services					
Social Services					\$260,228,469
Health Care and Mental Health Services					\$159,203,593
Subtotal					\$419,432,062
TOTAL DAMAGE	\$131,060,314	\$1,375,984,680	\$2,372,959,849	\$282,589,149	\$4,643,031,284
Hazard Mitigation Infrastructure	\$818,301,674	\$387,956,545	\$140,384,693	\$174,816,935	\$1,521,459,847

Table 1-2
Harris County Total Damages by Jurisdiction



Harris County Total Damages by Jurisdiction	Harris County Governments	Incorporated	Unincorporated	Authority	Total
Hazard Mitigation Economic Development					\$21,824,500
Hazard Mitigation Social Services					\$36,430,402
Hazard Mitigation Mental Health					\$81,801,538
Special Needs Housing					\$81,750,000
TOTAL HAZARD MITIGATION	\$818,301,674	\$387,956,545	\$140,384,693	\$174,816,935	\$1,743,266,287
GRAND TOTAL DAMAGES AND HAZARD MITIGATION	\$949,361,988	\$1,763,941,225	\$2,513,344,542	\$457,406,084	\$6,164,491,132

Table 1-2
Harris County Total Damages by Jurisdiction - Continued

1.3.1.6 Identifying Displaced Households

The methodology incorporated identifying uninhabitable units classified as level 3, major damage, or level 4, destroyed, to determine the number of replacement residential housing units needed in Harris County, because of damage sustained from Hurricane Ike.

A combination of 2008 Census Tract & Block data from the U.S. Department of Commerce, U.S. Census Bureau statistics and areas within Harris County defined as displaced by inspection, results were used to project the number of uninhabitable households. All demographic and household information resides in the Census based geography of a "block," the smallest geographic unit in which Census information is reported. Using GIS technology, the Census blocks were geographically mapped throughout Harris County, to access demographic information for each block, to facilitate isolating areas with high numbers of level 3 and level 4 inspection results. Demographic information available at the Census block level includes data, such as, population, number of households, median age and income levels. Areas within level 3 and level 4 damage inspection results correlated to Census block data and HCAD residential units to estimate uninhabitable units, within a given geographic boundary.

1.3.1.7 Reporting

It is important to note, differences may exist in the manner in which Harris County and individual cities, included in this report, categorized ODLs because of dissimilar methodologies. These differences exist because some cities may use different "units of measure" to describe residential property, or may classify residential property differently than Harris County. For example, Harris County defined a residential unit as a "single taxable property" independent of its categorization as a multifamily property, while an individual city may have included all residences in a multi-family property as individual residential. Moreover, Harris County's methodology included only residential properties, while an individual city may have counted mixed-use properties as residential properties.

1.3.2 Non Housing

On December 18, 2008, Harris County invited all municipalities, authorities, and other local agencies within Harris County to attend an informational workshop regarding damages caused by Hurricane Ike. The purpose of the meeting was to coordinate the collection of specific and accurate data on the



damages and subsequent unmet fiscal needs of each community. Specific areas of need include infrastructure, economic development, and public services

1.3.2.1 Infrastructure

After providing background information to the various Harris County communities regarding resources for funding recovery projects, Harris County provided a standardized spreadsheet to each entity to complete. The spreadsheet organized the data into various categories, indicated damage, type of damage, source of damage (flood, wind, surge), as well as estimated repair cost, among others. Specific infrastructure categories include Critical Infrastructure, Transportation, Navigation and Waterways, Utility Infrastructure, and educational facilities. The County diligently followed up with each community and offered assistance to complete this form by contacting each entity that attended the public meeting. The goal was to further educate these communities about FEMA and CDBG funding mechanisms and how to assess damages caused by Hurricane Ike, as well as providing answers to specific questions each community had regarding this process. Harris County provided the opportunity to support each community with additional assistance in order to determine more accurate damage estimates.

Several of the local communities and entities stepped forward and assembled teams to survey and collect field data. This data was used to estimate the needs caused by Hurricane Ike. Most of the communities and entities visited highly valued the information and knowledge presented at each meeting. Through these processes, the County confirmed that many communities were not familiar with the FEMA or CDBG processes. Understanding the funding processes is critical for the recovery of all local jurisdictions within Harris County. Individual teams were dispatched at the request of each community to further explain the FEMA and CDBG processes that will be applicable to each community. Handouts were provided and round table discussions with City Managers, EOC coordinators and department heads proved to be extremely helpful in collecting damage and post Ike needs. The goal of gathering this data is to expedite recovery and diminish the burden on local communities.

1.3.2.2 Economic Development

As of January 14, 2009, SBA has approved more than \$40 million for economic injury loans to businesses and/or nonprofits in Harris County. According to the SBA, substantial economic injury is defined as "the inability of a business to meet its obligations as they mature and pay its ordinary and necessary operating expenses." The loans are meant to help meet necessary financial obligations that normally could have been met, had Hurricane Ike not occurred.

Ike has impacted numerous industries in Harris County. According to the "Hurricane Ike Impact Report" published in December 2008, "the 29 counties originally designated as disaster areas by FEMA are home to more than 26 percent of the total business establishments in Texas. Two-thirds of these establishments were located in Harris County (97,500 worksites)." Flooding from Ike's surge has caused tremendous damage to these businesses. The losses of revenue from downtime as well as the costs to replace inventory, machinery and equipment place a significant burden upon these businesses. Financial resources are needed quickly in order to get these businesses back up and running. These businesses may never come back if programs are not set up quickly to provide immediate assistance. Loss of even a small number of these businesses would further exacerbate the problems many local jurisdictions are currently experiencing. Local governments depend on small businesses for revenues that are critical to continuing essential services to their residents.



To assess the impact of the storm on countywide businesses, Harris County enlisted the assistance of the Greater Houston Partnership. The Partnership conducted a countywide survey of chambers of commerce, economic development organizations, and business association members. These agencies contacted their area's businesses and reported on damages to buildings and inventory and loss of business. Surveyors put significant efforts in obtaining data from surge area communities, such as Seabrook, Pasadena, La Porte, Deer Park, Nassau Bay, and Baytown.

1.3.2.3 Non-Housing Public Services

Social Services Method

With the assistance of the Houston United Way, a countywide survey was conducted of 584 social services agencies with 132 responding, a 22% response rate. These agencies reported on damage to buildings, client demand, and short- and long-term impact of the hurricane on their organization.

Health Method

Harris County is a national hub of hospitals, medical research facilities, and clinics and is home to 59 acute care hospitals with approximately 15,000 licensed beds and 11,000-staffed beds. With the assistance of the Harris County Healthcare Alliance, a survey was conducted of 30 health/mental health agencies representing 50 facilities countywide. These agencies reported on damage to buildings and equipment, loss of supplies, increase in uncompensated client services, and short- and long-term impact of the hurricane on their organization.



2 Unmet Needs

2.1 Approach

Based on past disaster recovery experiences, history has demonstrated that significant funding gaps exist between actual damage costs and the costs private insurance and FEMA are willing to reimburse. The difference is herein referred to as unmet needs. Definitions of unmet needs are unique for each of the four categories below:

2.1.1 Housing – Single and Multi-Family

Determining the unmet needs for single family units:

In the Louisiana administered, Hurricane Katrina, Road Home Program, a total of \$7,042,418,711 was disbursed to 121,066 homeowners. These homeowners received an average compensation award of \$58,170. In the Mississippi Phase I program, \$1,400,000,000 was disbursed to 18,379 homeowners with an average compensation award of \$76,174. Phase II of the Mississippi program disbursed \$410,000,000 to 5,930 homeowners who received an average award of \$69,140. In the Texas rehabilitation program, a total of \$29,468,965 has been disbursed to 476 homeowners. The average rehabilitation grant for Texas residents was \$60,897. These programs took into account the estimated costs of restoring modest homes to pre-disaster condition. Each program was required to look at the amount of FEMA and insurance proceeds paid to the homeowner and determine the unmet need which would be funded with Community Development Block Grants Funds. Each program was mindful of the federal law prohibiting duplication of benefits. When all the programs are looked at as a whole, a total of \$8,881,887,776 was disbursed to 145,851 homeowners. The average “unmet need” then equates to \$60,897 for each eligible homeowner.

Determining the unmet needs for multi-family units:

The Office of Housing and Urban Development’s HOME program is one of the largest affordable housing rehabilitation and construction program in the country. In the State of Texas, the average total development costs for a rental unit averages \$51,000. For this report, a conservative estimate for an average unmet need of \$40,000 per unit was chosen.

FEMA data was used to estimate the unmet needs for single family and multi-family housing in Harris County. The data is dated November 3, 2008 and is comprised of residents who applied for FEMA and had their home inspected. This number is conservative since there are many individuals who have applied for FEMA and as of the time of the report have not had their homes inspected and additional individuals who have applied for FEMA after this data became available. It is highly probable that there still remains individuals who have not yet applied for FEMA assistance due in part to the extension of FEMA’s deadline for applications. The new deadline is February 20, 2009.

Only residences that were classified by FEMA as receiving major or severe damage were used to determine the unmet needs of Harris County. It is assumed that those units with less damage will be fully covered by FEMA and insurance. Historical knowledge from similar disaster housing programs shows that approximately six percent (6%) of eligible homeowners and renters who meet the FEMA criteria will not apply for FEMA assistance.



Work force housing is crucial for a community's revitalization. There is a large need for work force housing after a devastating disaster due to the influx of outside labor sources. Housing is desperately needed to create a place where the new work force and displaced residents can live while rebuilding the community. In the aftermath of Hurricane Katrina work force housing was largely unavailable thus slowing recovery considerably.

The Table below illustrates the estimated "unmet" housing needs in Harris County.

Type of Assistance	Total Units	Average Unmet Needs per unit	Total Unmet Needs
Single Family Units	4,034	\$60,897	\$245,658,498
Multi Family Units	2,214	\$40,000	\$88,560,000
Work Force Housing	1,000	\$60,000	\$60,000,000
TOTALS	7,248	\$54,390	\$394,218,498

Table 2-1
Type of Assistance

2.1.2 Non-Housing

Unmet infrastructure needs are based on the estimated total infrastructure needs of Harris County and eligible political subdivisions (precincts, cities, authorities, school districts, etc.) less any FEMA or private insurance payments received or payments that are anticipated to be received to reimburse the eligible agency for infrastructure needs directly attributed to Hurricane Ike.

For the purposes of this report, various infrastructure projects have been submitted to Harris County from numerous agencies. Along with the project description, the agency included the anticipated cost for each project. In many cases, exact figures for each project were known and in others only planning level estimates were completed. In addition, the known or anticipated FEMA and private insurance reimbursements for each listed project were provided. The difference between the anticipated costs and the anticipated FEMA (and private insurance) reimbursement defines the unmet needs. Some important items to note are:

- ▼ Actual dollar values for known FEMA reimbursements were obtained and referenced from the FEMA Project Worksheets.
- ▼ Many projects listed by each agency may not be eligible for FEMA funding, but are fully eligible for CDBG funding. For these instances, zero dollars are listed for the anticipated reimbursement.
- ▼ Recent historical information from Hurricane Katrina suggests that approximately 15% of requested FEMA reimbursements will be denied, further increasing the value of the unmet needs. This has not been taken into account in this report.
- ▼ Under current CDBG legislation, the required 25% local match for FEMA eligible projects (categories C-G) are not eligible to be paid with CDBG funds. This gap represents an unmet need of the community. There were several projects received from the communities listed as zero (0) dollars



anticipated to be received from insurance or FEMA. In these cases, the entire project was considered as an unmet need.

- While FEMA has an avenue to fund eligible hazardous mitigation projects (HMGP) through the FEMA 404 HMGP Program, the available funds will be limited to approximately 15% of the total state FEMA funding (Individual Assistance + Public Assistance + Direct Federal Projects). This funding will be distributed competitively statewide based on needs and FEMA criteria. It is unlikely to be proportional to the FEMA funding value in each local community. Currently, there are no public estimates from FEMA to determine the amount available for HMGP funding. As such, no FEMA funding for HMGP projects was estimated for this report.

2.2 Summary

The breakdown by jurisdiction for expected FEMA and other sources to fund damage needs are shown in the Table 2-2 below:

Harris County Expected FEMA and Other Funding by Jurisdiction	Harris County Governments	Incorporated	Unincorporated	Authority	Total
Housing Assistance		\$1,074,287,426	\$2,111,595,954		\$3,185,883,380
Infrastructure					
Critical Infrastructure	\$45,035,814	\$9,664,570	\$0	\$0	\$54,700,383
Transportation	\$87,127	\$14,339	\$0	\$0	\$101,466
Navigation and Waterways	\$0	\$245,977	\$0	\$0	\$245,977
Utility Infrastructure	\$0	\$15,154	\$0	\$0	\$15,154
Educational Facilities	\$27,741,925				\$27,741,925
Subtotal	\$72,864,865	\$9,940,040	\$0	\$0	\$82,804,905
Economic Development					\$15,534,130
Public Services					
Social Services					\$3,024,000
Health Care and Mental Health Services					\$69,714,386
Subtotal					\$72,738,386
TOTAL DAMAGE	\$72,864,865	\$1,084,227,466	\$2,111,595,954	\$0	\$3,356,960,801
Hazard Mitigation Infrastructure	\$0	\$0	\$0	\$0	\$0
Hazard Mitigation Economic Development					\$0
Hazard Mitigation Social Services					\$0
Hazard Mitigation Mental Health					\$0
Special Needs Housing					\$0
TOTAL HAZARD MITIGATION	\$0	\$0	\$0	\$0	\$0
GRAND TOTAL DAMAGES AND HAZARD MITIGATION	\$72,864,865	\$1,084,227,466	\$2,111,595,954	\$0	\$3,356,960,801

**Table 2-2
Harris County Expected FEMA and Other Funding by Jurisdiction**



The breakdown by jurisdiction for unmet needs is shown in the Table 2-3 below:

Harris County Unmet Needs by Jurisdiction	Harris County	Incorporated Harris County	Unincorporated Harris County	Authorities	Total
Housing Assistance	\$0	\$132,931,412	\$261,287,086	\$0	\$394,218,498
Infrastructure					
Critical Infrastructure	\$16,704,621	\$150,195,876	\$76,809	\$93,969,135	\$260,946,441
Transportation	\$3,303,498	\$519,020	\$0	\$99,869,750	\$103,692,268
Navigation and Waterways	\$0	\$8,105,855	\$0	\$63,660,113	\$71,765,968
Utility Infrastructure	\$130,000	\$5,051	\$0	\$25,090,151	\$25,225,202
Educational Facilities	\$38,057,330	\$0	\$0	\$0	\$38,057,330
Subtotal	\$58,195,449	\$158,825,803	\$76,809	\$282,589,149	\$499,687,210
Economic Development					\$45,471,100
Public Services					
Social Services					\$257,204,469
Health Care and Mental Health Services					\$89,489,207
Subtotal					\$346,693,676
TOTAL DAMAGE	\$58,195,449	\$291,757,215	\$261,363,895	\$282,589,149	\$1,286,070,484
Hazard Mitigation Infrastructure	\$818,301,674	\$387,956,545	\$140,384,693	\$174,816,935	\$1,521,459,847
Hazard Mitigation Economic Development					\$21,824,500
Hazard Mitigation Social Services					\$36,430,402
Hazard Mitigation Mental Health					\$81,801,538
Special Needs Housing					\$81,750,000
TOTAL HAZARD MITIGATION	\$818,301,674	\$387,956,545	\$140,384,693	\$174,816,935	\$1,743,266,287
GRAND TOTAL DAMAGES AND HAZARD MITIGATION	\$876,497,123	\$679,713,760	\$401,748,588	\$457,406,084	\$3,029,336,771

Table 2-3
Harris County Unmet Needs by Jurisdiction



3 Housing

3.1 Summary

As of 2008, Harris County, the most populous county within the state of Texas, has a projected total population of 4,072,009 residents, which includes the City of Houston. The county encompasses 1,778 square miles.

Harris County's close proximity to the Gulf Coast leaves its southernmost areas vulnerable to the region's tropical storms and hurricanes. Hurricane Ike, which made landfall along the Texas Gulf coast September 13, 2008, was originally rated a massive Category 2 hurricane, but peaked to Category 4 strength. It left a path of destruction throughout Southeast Harris County. Though not as devastated, the northernmost reaches of the county were also affected by this powerful storm.

As discussed in Section 1, the purpose of this document is to demonstrate the damages and unmet needs as a result of Hurricane Ike in Harris County and all incorporated areas within Harris County with the exception of the City of Houston. As such, the housing data presented in this section are **exclusive** of the City of Houston.

A need for housing for special needs was identified during the data collection for this report. A project is being explored to combine multiple severely damaged Veterans services buildings into one location.

Of Harris County's 532,374 recorded housing units, a projected 43.3 percent were affected by Hurricane Ike. The 210,456 residential units that were affected at Level 1, suffered primarily cosmetic damages such as missing shingles or broken windows and possible flooding with less than six inches of water. A projected 16,281 of the county's residential units (3.1 percent), suffered minor damage which means that a substantial number of the county's residents may be dealing with not only missing shingles, or broken windows, but also damaged doors and loose or missing siding, minor shifting or settling of foundations and possible flooding with six inches to two feet of water. A projected 3,421 residential units, (0.6 percent of Harris County's total housing units), suffered major damage and were left uninhabitable; a projected 344 homes, (0.1 percent), were destroyed. Harris County has a projected total of \$3.58 billion in residential property damage. Roughly 3,765 residential units in Harris County are projected to be completely uninhabitable and 7,491 households are presumed to be displaced. These figures are summarized in **Table 3-1** below.

KEY DAMAGE PROJECTIONS:

Total Housing Units	532,374
Total Projected Residential Housing Damage	\$3.58 billion
Projected Single Family Units Uninhabitable (Major Damage or Destroyed)	3,765
Projected Single Family Units (Affected or Minor Damage)	222,577
Projected Multi-Family Units Affected or Minor Damage	4,160
Projected Displaced Households	7,491



3.1.1 Total Harris County

Total Harris County Housing Unit Type	Number of Housing Units	Type of Damage					Total Improvement Value	Total Damage Value
		Level 0	Level 1	Level 2	Level 3	Level 4		
Single Family	524,527	298,769	206,568	15,655	3,220	315	\$64,471,672,408	\$3,068,154,979
Mobile Home	549	185	299	55	9	1	\$24,132,465	\$2,974,844
Multi-Family	7,298	2,918	3,589	571	192	28	\$4,481,752,610	\$508,972,055
TOTAL	532,374	301,872	210,456	16,281	3,421	344	\$68,977,557,483	\$3,580,101,878
% of Total		56.7%	39.5%	3.1%	0.6%	0.1%		5.2%
3 & 4 Totals (Uninhabitable)					0.7%			\$283,408,293

Table 3-1
Total Harris County Housing Unit Type

Outlined below are some quick facts regarding residential damage sustained from Hurricane Ike.

3.1.2 Quick Facts

- ▼ Hurricane Ike was one of the costliest storms in recent years with a projected \$3.58 billion in residential damage in Harris County alone.
- ▼ There were 84 reported deaths region-wide (Galveston, Chambers and Harris Counties).
- ▼ Harris County has a total of more than 532,374 residential units (single family, multi-family, and mobile home). Of the total units, about 230,502 or 43.3 percent, experienced damage, ranging from affected to destroyed.
- ▼ Approximately 3,765 residential units in Harris County are estimated to be completely uninhabitable and 7,491 households are presumed to be displaced.
- ▼ Nearly all Harris County residents lost power during the storm and it took 18 days for power to be restored to 95 percent of CenterPoint Energy's 2.3 million customers.
- ▼ As a result of Hurricane Ike, over 16 million units of meals ready-to-eat (MREs), ice and water were distributed for an eight-day period through a total of 35 Points of Distribution (POD) in Harris County.

3.2 Cities with Significant Housing Damage

Of the 34 cities in Harris County, 26 suffered damage from Ike, which rendered some residential units uninhabitable. Houston, the seat of Harris County and the fourth largest city in the United States, experienced flooding, high winds, fallen trees, massive debris from damaged residential housing and businesses, and loss of power to more than 95 percent of its residents. Many smaller and lower profile communities in Southeast Harris County experienced more damage on a per capita basis. Shoreacres, El Lago, Seabrook, Nassau Bay, La Porte, Morgan's Point and Galena Park suffered the most severe housing damage of all the cities within Harris County, having the highest percentage of residential units declared as uninhabitable. An overview of damage assessments for these cities is shown in Table 3-2 below. Figure 3-1 for locations of cities with significant housing damage.



Summary of Harris County Cities Sustaining the Most Significant Damage to Residential/Housing Units	Number of Residential/Housing Units	Percentage Incurring No Damage (Level 0)	Percentage Incurring Minor Damage (Levels 1-2)	Percentage Incurring Major Damage (Levels 3-4)
Shoreacres	677	15.2%	26.2%	58.6%
El Lago	1,236	28.0%	59.4%	12.6%
Seabrook	3,696	24.0%	64.6%	11.4%
Nassua Bay	1,457	26.5%	63.4%	10.1%
La Porte	10,150	28.9%	66.4%	4.7%
Morgan’s Point	59	67.8%	28.8%	3.4%
Galena Park	2,894	42.3%	54.7%	3.0%

Source: Harris County Public Infrastructure Department (HCPID)

Table 3-2
Summary of Harris County Cities Sustaining the Most Significant Damage to Residential/Housing Units

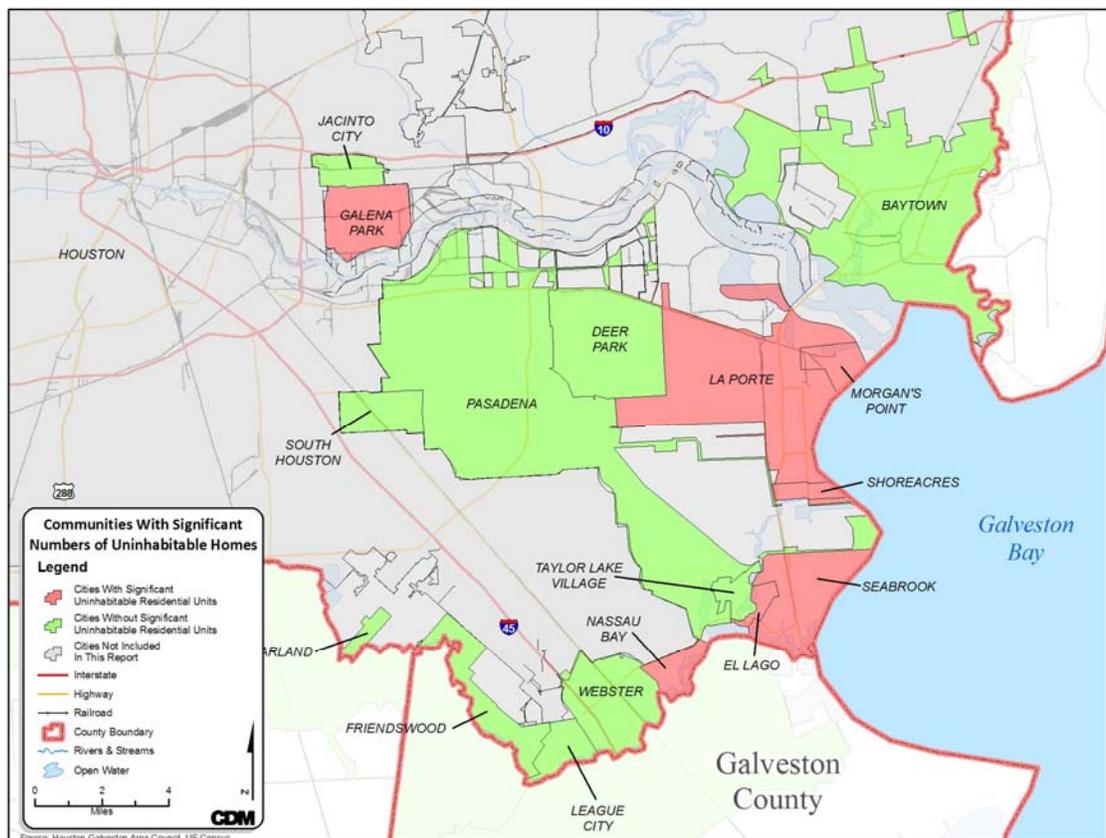


Figure 3-1
Communities with Significant Numbers of Uninhabitable Homes

3.2.1 Shoreacres

Shoreacres is a Bay Area city of approximately 1,552 people that lies on Galveston Bay south of La Porte. Its location makes it a prime target of Gulf Coast storm activity and Hurricane Ike was no exception. Ike rolled over the 677 single family units in Shoreacres, leaving an estimated \$33.2 million in damage in its wake. About 85 percent of the residential units in Shoreacres sustained some damage, which includes 397 units rendered uninhabitable. The damage value of residential units made uninhabitable by the storm is estimated at \$27 million.

3.2.2 El Lago

The city of El Lago has a population of approximately 4,123 and is located in Southeast Harris County in the area between Houston and Galveston. It sits across Taylor Lake from Clear Lake City. The area grew significantly between 1967 and 1975, as workers came to nearby Lyndon B. Johnson Space Center. The city's location on the Gulf Coast made it susceptible to the ravages of Hurricane Ike, which damaged 890 of El Lago's 1,236 residential units. Of this total, 156 units were damaged severely, making them uninhabitable. The majority of the uninhabitable units were multi-family. The damage value of residential units made uninhabitable by Hurricane Ike is estimated at \$6 million, with the projected total damage amount for the city of El Lago at \$22.4 million.

3.2.3 Seabrook

Seabrook, a Clear Lake, Bay Area city of approximately 11,455 people, sits halfway between the cities of Houston and Galveston. Fishermen were the first residents of this community, which still boasts its fresh fish store, stocked by fisherman and shrimpers who deliver their catch to market each day. Seabrook has a total of 3,696 residential units, of which 2,810 units sustained damage. Approximately 422 units were rendered uninhabitable. Seabrook's location on the Gulf Coast put it directly in the path of Hurricane Ike. The projected total residential damage amount for the city of Seabrook is \$111.8 million.

3.2.4 Nassau Bay

Nassau Bay is a city surrounded on three sides by water, including Clear Lake, Clear Creek and Cow Bayou and has approximately 4,466 people. The 1.33 square mile city began as a real estate development along the shores of Clear Lake in 1962, coinciding with the development of the National Aeronautics and Space Administration (NASA). It sits halfway between Houston and Galveston and next door to NASA's Johnson Space Center. Nassau Bay was not spared from Hurricane Ike's rage. Of the 1,457 residential units, 147 were rendered uninhabitable. The storm damaged 1,071 of Nassau Bay's 1,457 residential units. The projected total residential damage amount for the city of Nassau Bay is \$50.6 million.

3.2.5 La Porte

La Porte is the fourth largest incorporated city in Harris County, with a population of approximately 35,755 people. It is located in eastern Harris County where the Houston Ship Channel enters Galveston Bay and sits across the bay from Baytown. In addition to being home to several large petrochemical plants, La Porte boasts the Barbours Cut Terminal and the San Jacinto Battleground site where Texas gained independence from Mexico. La Porte's location placed it directly in Hurricane Ike's path, as it



spiraled up the Gulf Coast. Out of La Porte's 10,150 residential units, 7,219 suffered damage ranging from affected to total destruction. Of this total, 474 La Porte residential units incurred major damage, or were destroyed. The projected total residential damage value amount for the city of La Porte is \$142.8 million.

3.2.6 Morgan's Point

Morgan's Point has a population of approximately 365 residents and sits between Baytown and La Porte on Galveston Bay. The community was settled in 1822, when Texas was still part of Mexico. In the early 20th century, it was the site of a ferry landing at the San Jacinto River. Its location at the mouth of the river and the Houston Ship Channel makes it a prime location for containerized shipping terminals. Morgan's Point's location also set it in the path of Hurricane Ike, which damaged 19 of the city's 59 housing units. The projected total residential damage value amount for the city of Morgan's Point is \$403,218.

3.2.7 Galena Park

Galena Park has a population of approximately 11,053 residents and is located northwest of Pasadena and east of Houston. Galena Park began in 1835 as a farming and ranching community, but in the 1880's it became a railroad center serving the Port of Houston. With the advent of the petrochemical industry in the early 1900's, this community transformed itself into a refinery center. Galena Park has 2,894 housing units and Hurricane Ike left its imprint on this community, impacting 1,670 units with some level of storm damage. Of this total, 88 residential units were left uninhabitable. The majority of units that sustained damage were single family units. The projected total residential damage value amount for the city of Galena Park is \$19.2 million.



4 Non-Housing - Infrastructure

The infrastructure damage information presented in this report has been divided into five broad categories to enhance understanding of the different types of infrastructure that were affected and to better understand the impacts of Hurricane Ike and what may be necessary for a full recovery by Harris County. The five major categories of infrastructure are critical infrastructure, transportation, navigation and waterways, utility infrastructure, and educational facilities. The following sections further describe the five categories and include examples of some of the projects that can be found in each category.

Table 4-1 includes the total value of repair and mitigation projects identified, and the sum of these projects presented in the total needs column. The table also includes funds expected to be received from FEMA or other funding sources such as insurance that may be used towards project execution. The last column in the table represents unmet needs which is the difference between the total needs and funding expected from FEMA and other funding sources. Additional infrastructure may be found in Section 6 – Non Housing – Public Services in Table 6-1 and Table 6-2.

As shown in the Table 4-1 unmet infrastructure needs exceed \$2 billion, including \$1.4 billion in Critical Infrastructure needs. Table 4-2 indicates the damage by damage type.

All Infrastructure Unmet Needs	Repair and New Projects	Hazard Mitigation Needs	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$18,724,265	\$40,141,800	\$58,866,065	\$523,140	\$58,342,926
Sewer	\$84,123,934	\$154,294,890	\$238,418,824	\$742,545	\$237,676,279
Drainage	\$37,186,158	\$438,256,190	\$475,442,348	\$92,284	\$475,350,064
Buildings	\$89,314,747	\$116,534,416	\$205,849,163	\$3,972,752	\$201,876,411
Equipment	\$6,156,335	\$3,307,300	\$9,463,635	\$26,343	\$9,437,292
Generators	\$306,673	\$351,277,718	\$351,584,392	\$56,248	\$351,528,144
Other Infrastructure	\$39,147,837	\$29,240,000	\$68,387,837	\$12,671,356	\$55,716,480
Debris Removal	\$34,895,343	\$0	\$34,895,343	\$34,809,513	\$85,830
Parks, Recreational Facilities	\$5,791,532	\$11,613,400	\$17,404,932	\$1,806,203	\$15,598,730
Subtotal	\$315,646,824	\$1,144,665,714	\$1,460,312,538	\$54,700,383	\$1,405,612,155
Navigation and Waterways	\$72,011,945	\$73,952,500	\$145,964,445	\$245,977	\$145,718,468
Transportation	\$103,793,734	\$273,066,400	\$376,860,134	\$101,466	\$376,758,668
Utility Infrastructure	\$25,240,356	\$16,877,000	\$42,117,356	\$15,154	\$42,102,202
Educational Facilities	\$65,799,255	\$12,898,233	\$78,697,488	\$27,741,925	\$50,955,563
TOTALS	\$582,492,114	\$1,521,459,847	\$2,103,951,962	\$82,804,905	\$2,021,147,057

Table 4-1
All Infrastructure Unmet Needs



All Infrastructure Projects by Damage Type	Repair and New Projects	Hazard Mitigation Needs	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$107,111,752	\$40,311,733	\$147,423,485	\$40,958,670	\$106,464,815
Flood	\$46,420,264	\$124,566,455	\$170,986,719	\$6,996,300	\$163,990,419
Surge	\$140,351,288	\$235,801,330	\$376,152,618	\$2,503,447	\$373,649,172
Other	\$288,608,810	\$1,120,780,329	\$1,409,389,140	\$32,346,489	\$1,377,042,651
TOTAL	\$582,492,114	\$1,521,459,847	\$2,103,951,962	\$82,804,905	\$2,021,147,057

Table 4-2
All Infrastructure Projects by Damage Type

4.1 Critical Infrastructure

4.1.1 Summary

The information obtained by Harris County from local cities and other entities indicates that Ike severely affected such things as publicly owned buildings, water and wastewater treatment plants, emergency equipment and facilities, communications equipment and facilities, and parks and recreational facilities. All of these items are included as part of the Critical Infrastructure category of damages. The project information collected indicates a need of over \$315 million for Critical Infrastructure projects. When the projects identified for hazard mitigation are added to the repair projects, the total exceeds \$1.1 billion.

4.1.2 Sub-Category Definitions and Findings

Critical Infrastructure needs were classified into several categories as described below:

- ▼ **Water:** includes all infrastructure dealing with water production, treatment, and delivery, including but not limited to: pipelines, treatment plants, wells, and pump stations.
- ▼ **Sewer:** includes all infrastructure dealing with wastewater collection and treatment including but not limited to: gravity lines, force mains, treatment plants, and lift stations.
- ▼ **Drainage:** includes all infrastructure dealing with stormwater management, such as drainage canals, ditches, culverts, stormwater pipeline systems, etc.
- ▼ **Buildings:** includes publicly owned buildings such as City Departments, Fire Stations, Police Stations, Call Centers, Emergency Operations Centers, Community Centers, etc.
- ▼ **Equipment:** includes communication equipment, emergency response equipment, publicly owned vehicles, etc.
- ▼ **Generators:** Includes the repair, replacement, or acquisition of generators to power critical infrastructure such as lift stations, fire and police stations, sewer and water plants, and other facilities necessary during an emergency,

TOTAL CRITICAL INFRASTRUCTURE NEEDS:

Repairs Needs\$315 million

Hazard Mitigation Needs\$1.1 billion



- ▼ **Other infrastructure:** Includes items such as exterior features of public facilities, public alert systems, environmental samplers, development of certain emergency focused education programs and any other element not covered by the other Critical Infrastructure subcategories.
- ▼ **Debris removal:** Includes removal of debris that occurred immediately following the storm.
- ▼ **Park and Recreational Facilities:** includes all ancillary subsets of parks, including fencing, tables, pavilions, playgrounds, etc.

Below are some of the critical infrastructure projects identified in Harris County.:

Water

- ▼ Nassau Bay Swan Lagoon water well repairs
- ▼ Adair Park water well
- ▼ Seabrook water line repairs
- ▼ Pasadena water tank repair
- ▼ Shoreacres Water Plant No. 1

Sewer

- ▼ Nassau Bay Surf Court force main and sanitary sewer repair/replace
- ▼ Baytown's East District and Central District Wastewater Treatment Plants
- ▼ Pasadena's treatment plant and lift stations repairs
- ▼ Bellaire's Wastewater Treatment Plants

Generators

- ▼ HCFCD North Service Center Building
- ▼ Seabrook 1400 Cook Street Complex
- ▼ Harris County Information Technology Center

Drainage

- ▼ Nassau Bay's Detention Pond Facility and Upper Bay Stormwater Pump Station
- ▼ Jersey Village's Drainage Channel

Buildings

- ▼ Pasadena's Public Works, Permits, Planning, Engineering, Housing, and Call Center Buildings
- ▼ South Houston's Police Station, Fire House, and City Hall
- ▼ Webster's Fire Station
- ▼ Jacinto City's Police Station
- ▼ Seabrook's City Building
- ▼ Friendswood Brookside Building
- ▼ Baytown's Recycle Center
- ▼ Pasadena Police Station

Critical Infrastructure allows the County and cities to properly function. Prioritized attention towards Critical Infrastructure will enable restoration of the basic services local governments offer provide to ensure the public health, safety and welfare.



4.1.3 Storm Damage Causes and Findings

For each repair project identified, the County asked the cities and local communities to indicate the cause of the damage. There were four categories provided for this—flood, surge, wind, and other. These categories are defined for the purposes of this report as follows:

- ▼ **Flood:** Indicates damage originated by rising water. This type of damage generally does not provide a hard impact force on a structure but rather submerges it gradually and leaves the structure exposed to the water. Cables, electrical equipment, motors, computers are extremely sensitive to this.
- ▼ **Surge:** Generates a high impact shock wave that generally destroys or severely damages structures.
- ▼ **Wind:** High velocity winds put additional stress on structural members, antennas, and other equipment causing them to fail or break away.
- ▼ **Other:** This category was used when the cause of the damage was not specifically known, or when one of the other three types of damage was not selected.

The list of Critical Infrastructure damages and their causes is compiled in **Table 4-3** below.

Critical Infrastructure by Damage Type	Repair and New Projects	Hazard Mitigation Needs	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$63,828,185	\$24,883,500	\$88,711,685	\$27,338,330	\$61,373,355
Flood	\$32,584,067	\$94,566,455	\$127,150,522	\$3,043,296	\$124,107,227
Surge	\$107,104,821	\$229,505,330	\$336,610,151	\$2,180,264	\$334,429,888
Other	\$112,129,751	\$795,710,429	\$907,840,180	\$22,138,494	\$885,701,686
TOTAL	\$315,646,824	\$1,144,665,714	\$1,460,312,538	\$54,700,383	\$1,405,612,155

Table 4-3
Critical Infrastructure by Damage Type

4.2 Transportation

4.2.1 Summary

The total reported damage for the transportation category and the cost of new projects due to Hurricane Ike is estimated to be \$103.8 million. Most projects are located in a handful of cities including Baytown, Bellaire, Hilshire Village, LaPorte, Seabrook, Webster, and Port of Houston Authority. The largest numbers of projects include road and sidewalk repairs as well as other paving or repaving efforts. Hazard mitigation projects were also identified and total approximately \$273 million as shown on **Table 4-4**.

The largest hazard mitigation project is to provide passenger rail service between Galveston and Houston which would reactivate an existing 45 mile rail line that is currently not in use and incorporate new light rail car technology. One of the main benefits would be a fast and efficient evacuation method for the City of Galveston and Galveston County residents. In addition, a study sponsored by Galveston County indicates that this line will be a cost effective solution to the already congested I-45 and will highly improve the value of property and tax revenue near proposed stations. The commuter line could also



serve for tourism purposes, making Galveston and its cruise terminal more accessible spurring economic development.

Other major hazard mitigation projects include repairing and protecting the Washburn Tunnel and countywide thoroughfare improvements.

4.2.2 Transportation Infrastructure Damage Causes

Out of the four categories defined in the previous section (flood, surge, wind, and not yet classified) the reported breakdown of transportation infrastructure damage by category is shown in Table 4-4 below.

Transportation by Damage Type	Repair and New Projects	Hazard Mitigation Needs	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$143,766	\$0	\$143,766	\$21,256	\$122,510
Flood	\$3,240,696	\$26,000,000	\$29,240,696	\$3,004	\$29,237,692
Surge	\$558,522	\$3,345,000	\$3,903,522	\$77,206	\$3,826,316
Other	\$99,850,750	\$243,721,400	\$343,572,150	\$0	\$343,572,150
TOTAL	\$103,793,734	\$273,066,400	\$376,860,134	\$101,466	\$376,758,668

Table 4-4
Transportation by Damage Type

4.3 Navigation and Waterways

4.3.1 Summary

The Navigation and Waterways category encompasses riprap repairs, re-opening of sediment laden navigable waterways, waterways debris removal, and over-the-water facilities, among others.

The total reported damages to Navigation and Waterways Infrastructure and the cost of new projects due to Hurricane Ike are estimated to be \$72 million. Hazard mitigation needs are estimated to be \$74 million. Total needs for Navigation and Waterways projects are almost \$146 million.

The Port of Houston suffered the most damage (\$64 million) mostly to debris removal needs. The Port of Houston Authority is discussed in detail in section 7.4.3.

The City of Baytown reported \$7.5 million of hurricane damage on its waterways. The main repairs are needed on the Bayland floating docks, dredging of the marina and navigable waterways, lost riprap at the nature center and Britton Park shorelines, and debris removal in multiple waterway locations.

The City of El Lago reported \$45,000 of estimated waterway debris removal cost from sunken vessels damaged by Hurricane Ike. These sunken vessels are obstructing navigation to their marina and therefore obstructing economic recovery of the city. The bulkhead along the marina was also damaged, but no cost estimate has been provided to date.

The City of La Porte, in conjunction with Harris County, reported over 75 percent damage to the Sylvan Beach Pier, with an estimated replacement cost of \$560,000.



The City of Seabrook reported three facilities that were damaged over 75 percent—the city boat ramp at the waterfront, riprap repair at Pine Gulley, and replacement of their fishing pier at Piney Gulley. The estimate for the three projects is less than \$300,000.

4.3.2 Navigation and Waterways Damage Causes

Out of the four categories defined in the previous section (flood, surge, wind, and not yet classified) the reported breakdown of Navigation and Waterway damage by category is shown in the table below.

Navigation and Waterways by Damage Type	Repair and New Projects	Hazard Mitigation Needs	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$100,000	\$0	\$100,000	\$0	\$100,000
Flood	\$1,500,000	\$0	\$1,500,000	\$0	\$1,500,000
Surge	\$32,686,945	\$2,951,000	\$35,637,945	\$245,977	\$35,391,968
Other	\$37,725,000	\$71,001,500	\$108,726,500	\$0	\$108,726,500
TOTAL	\$72,011,945	\$73,952,500	\$145,964,445	\$245,977	\$145,718,468

Table 4-5
Navigation and Waterways by Damage Type

4.4 Utility Infrastructure

4.4.1 Summary

The total reported Utility Infrastructure damages and the cost of new projects due to Hurricane Ike is estimated to be \$25.2 million. The additional hazard mitigation funding required in this category is estimated to be \$16.9 million. A general list of the projects from the surveyed communities is:

- ▶ Communication Towers & Antennas
- ▶ Fiber Optic Infrastructure
- ▶ Electrical Power Distribution Systems

4.4.2 Utility Infrastructure Damage Causes

Out of the four categories defined in the previous section (flood, surge, wind, and not yet classified) the reported breakdown of Utility Infrastructure damage by category is shown in Table 4-6 below.

Utility Infrastructure by Damage Type	Repair and New Projects	Hazard Mitigation Needs	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$239,356	\$7,000,000	\$7,239,356	\$15,154	\$7,224,202
Flood	\$0	\$0	\$0	\$0	\$0
Surge	\$1,000	\$0	\$1,000	\$0	\$1,000
Other	\$25,000,000	\$9,877,000	\$34,877,000	\$0	\$34,877,000
TOTAL	\$25,240,356	\$16,877,000	\$42,117,356	\$15,154	\$42,102,202

Table 4-6
Utility Infrastructure by Damage Type



4.5 Educational Facilities

Several Independent School Districts reported severe to light damage as a result of Hurricane Ike. Districts that reported damages and submitted them to Harris County are shown on **Figure 4-1** below. Pasadena ISD, Houston ISD, and Goose Creek ISD account for approximately 70% of the reported damages and hazard mitigation needs.

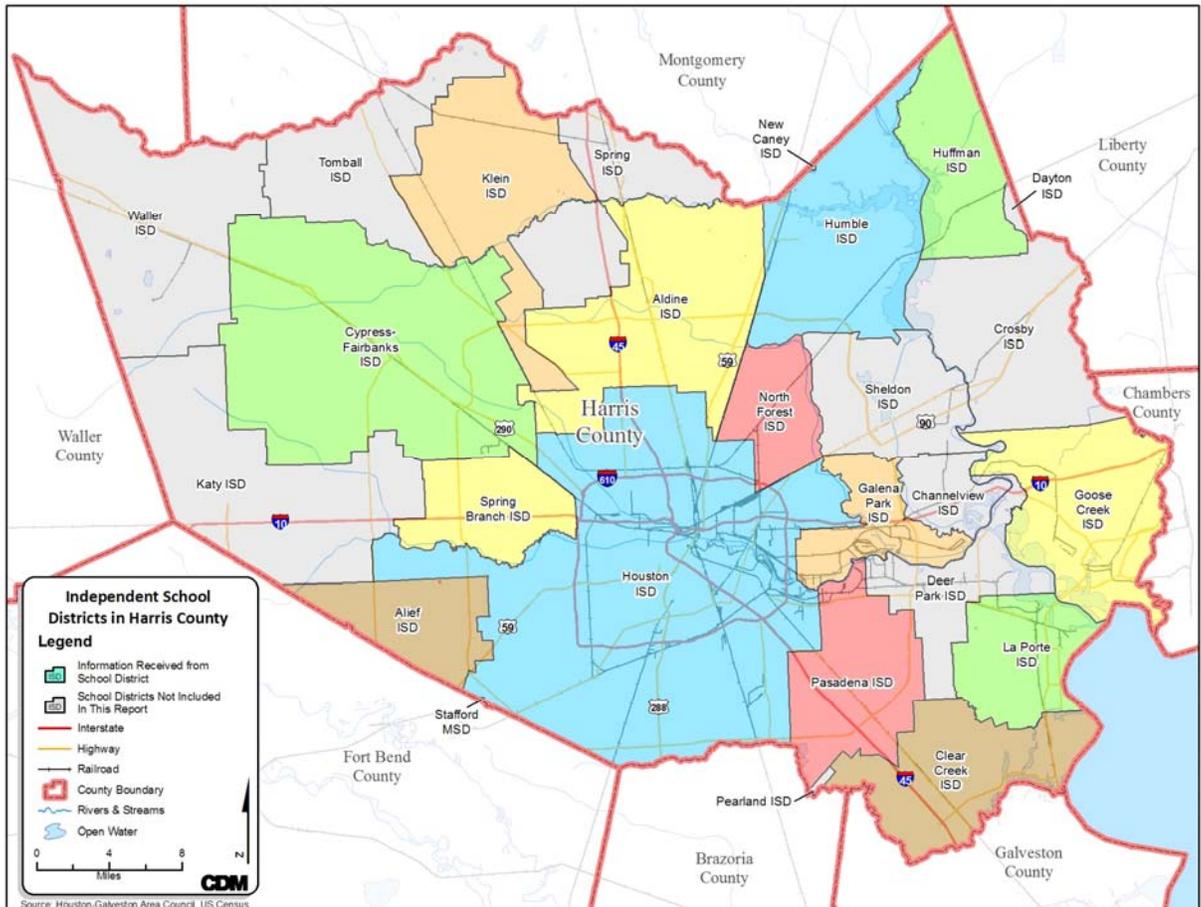


Figure 4-1
Independent School Districts in Harris County

Out of the four categories defined in the previous section (flood, surge, wind, and not yet classified) the reported breakdown of Educational Facilities damage by category is shown in Table 4-7 below.

Educational Facilities by Damage Type	Repair and New Projects	Hazard Mitigation Needs	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$42,800,445	\$8,428,233	\$51,228,678	\$13,583,930	\$37,644,749
Flood	\$9,095,500	\$4,000,000	\$13,095,500	\$3,950,000	\$9,145,500
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$13,903,310	\$470,000	\$14,373,310	\$10,207,995	\$4,165,315
TOTAL	\$65,799,255	\$12,898,233	\$78,697,488	\$27,741,925	\$50,955,563

Table 4-7
Educational Facilities by Damage Type

Out of the ISDs that submitted damages, the reported breakdown by ISD is shown in Table 4-8 below.

School District Damage Summary	Repair and New Projects	Hazard Mitigation Needs	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Aldine ISD	\$1,368,500	\$70,000	\$1,438,500	\$871,875	\$566,625
Alief ISD	\$6,142,218	\$0	\$6,142,218	\$5,488,221	\$653,997
Clear Creek ISD	\$7,947,973	\$0	\$7,947,973	\$5,960,980	\$1,986,993
Cypress Fairbanks ISD	\$3,647,219	\$0	\$3,647,219	\$2,760,188	\$887,031
Galena Park ISD	\$621,926	\$0	\$621,926	\$466,444	\$155,481
Goose Creek ISD	\$625,000	\$8,300,000	\$8,925,000	\$0	\$8,925,000
HCDE	\$283,118	\$0	\$283,118	\$212,337	\$70,781
Houston ISD	\$13,040,000	\$4,070,000	\$17,110,000	\$5,785,000	\$11,325,000
Huffman ISD	\$198,672	\$0	\$198,672	\$0	\$198,672
Humble ISD	\$662,692	\$458,233	\$1,120,925	\$417,031	\$703,894
Klein ISD	\$3,833,864	\$0	\$3,833,864	\$45,578	\$3,788,286
La Porte ISD	\$4,142,780	\$0	\$4,142,780	\$847,280	\$3,295,500
North Forest ISD	\$5,511,390	\$0	\$5,511,390	\$4,886,991	\$624,400
Pasadena ISD	\$16,132,704	\$0	\$16,132,704	\$0	\$16,132,704
Spring Branch ISD	\$1,641,200	\$0	\$1,641,200	\$0	\$1,641,200
TOTAL	\$65,799,255	\$12,898,233	\$78,697,488	\$27,741,925	\$50,955,563

Table 4-8
School District Damage Summary



5 Non-Housing - Economic Development

5.1 Introduction

The 10-county Houston metropolitan area ranked as the number one place to live in the country, according to Kiplinger Personal Finance in July 2008. Kiplinger reviewed places with strong economies and abundant jobs, reasonable living costs and plentiful entertainment amenities. The Houston MSA recorded 2.6 million payroll jobs in March 2008, more than the job counts of 29 other U.S. states, including Colorado, Alabama and South Carolina. The Houston MSA's gross product in 2007 was \$416.6 billion, according to The Perryman Group. If Houston MSA were a country, its economy would be larger than that of Belgium, Malaysia, Venezuela or Sweden, according to the CIA's World Factbook. Only 28 foreign nations' gross product exceeds Houston MSA's. And then came Hurricane Ike and its affect on this robust economy.

The Houston MSA recorded 2.6 million payroll jobs in March 2008, more than the job counts of 29 other U.S. states, including Colorado, Alabama and South Carolina.

As Hurricane Ike faded and rain clouds moved out of the region, business owners in Harris County began to assess the storm's damage to buildings and inventory. This process was hampered by widespread power outages that effected 2.15 of 2.26 million customers in the CenterPoint Energy network. For more than two-thirds this number, the outage would last for more than a week, with many going as long as two to three weeks without power. The storm and aftermath brought business in the county to a near stand still.

As of January 14, 2009, SBA has approved more than \$40 million for economic injury loans to businesses and/or nonprofits in Harris County. According to the SBA, substantial economic injury is defined as "the inability of a business to meet its obligations as they mature and pay its ordinary and necessary operating expenses." The loans are meant to help meet necessary financial obligations that normally could have been met, had Hurricane Ike not occurred.

Ike has impacted numerous industries in Harris County. According to the "Hurricane Ike Impact Report" published in December 2008, "the 29 counties originally designated as disaster areas by FEMA are home to more than 26 percent of the total business establishments in Texas. Two-thirds of these establishments were located in Harris County (97,500 worksites)." Flooding from Ike's surge has caused tremendous damage to these businesses. The losses of revenue from downtime as well as the costs to replace inventory, machinery and equipment place a significant burden upon these businesses. Financial resources are needed quickly in order to get these businesses back up and running. These businesses may never come back if programs are not set up quickly to provide immediate assistance. Loss of even a small number of these businesses would further exacerbate the problems many local jurisdictions are currently experiencing. Local governments depend on small businesses for revenues that are critical to continuing essential services to their residents.

To assess the impact of the storm on countywide businesses, Harris County enlisted the assistance of the Greater Houston Partnership. The Partnership conducted a countywide survey of chambers of commerce, economic development organizations, and business association members. These agencies



contacted their area’s businesses and reported on damages to buildings and inventory and loss of business. Surveyors put significant efforts into obtaining data from surge area communities, such as Seabrook, Pasadena, La Porte, Deer Park, Nassau Bay, and Baytown.

5.2 Structural Damage

During the survey, responders were asked about damages to their facilities due to the Hurricane. The total estimated cost was \$46 million with approximately \$15 million reimbursable by FEMA or insurance, leaving over \$31 million in unmet needs. In addition, there were over \$21 million reported for hazard mitigation needs of the damaged facilities. These figures are summarized in Table 5-1 below. Of those surveyed, 32.3% had damages of more than 50% of the value of their facility. It is important to note that these figures represent only 65 of the approximate 29,400 business establishments in Harris County and incorporated areas (these figures do not include business establishments located in the City of Houston).

Type of Damage	Cost	Percentage
Physical Damage	\$45,870,167	19.4%
Business Lost	\$11,825,776	1.1%
Other Costs	\$2,617,087	4.43%
Inventory Lost	\$692,200	75.2%
Subtotal ED Loss	\$46,168,167	100%
Mitigation	\$21,824,500	
*Total ED Needs	\$67,992,667	
Reimbursed	\$15,534,130	22.85%
Unmet Needs	\$52,458,537	77.15%

*Based on surveys returned

Table 5-1
Harris County Economic Development Loss Summary

5.3 Damages to Inventory and Loss of Business

Hurricane Ike caused a significant disruption to businesses not only by damaging the structures housing the business, but also the loss of inventory and business during and after the storm.

Many of these businesses will not be fully reimbursed by insurance for loss of inventory or revenue due to this type of event and closures for such an extended period of time. In the survey, responders were asked about loss of inventory and business during and after the storm. For the 65 businesses surveyed, the total estimated value of inventory loss was \$692,200 and the estimated loss of business was \$11.8 million.

5.4 Additional Needs

Due to the small sample size of respondents, the magnitude of the true value of unmet economical development needs cannot be fully determined. Harris County will continue to work with local associations and encourage outreach programs in order to better assess the full impact and needs to prevent any further erosion in a once vibrant and healthy local economy.



6 Non-Housing - Public Services

6.1 Social Service Network

Harris County's social services network assisted in the preparation for, and the recovery from, Hurricane Ike. Many agencies in the network continued to provide care even after significant loss to their organization's buildings.

With the assistance of the Houston United Way, a countywide survey was conducted of 584 agencies with 132 responding, a 22% response rate. These agencies reported damages to buildings, increased client demand, and short- and long-term impact of the hurricane on their organization.

Projected unmet needs for structural damage to social services facilities are estimated at \$257 million.

Projected increased client service needs for social services in 2009 are projected to exceed \$200 million.

6.1.1 Structural Damage

During the survey, responders were asked about damages to their facilities due to the Hurricane. Of the 132 responders, 94 organizations or 71% reported structural damage to their agency's facility. Of those buildings damaged, 11% had damages to more than 50% of the facility. The total estimated cost of repairs identified to date is \$18.6 million with approximately \$3 million identified to date as reimbursable by FEMA or insurance which leaves \$15.6 million in unmet needs. In addition, there were over \$36 million reported for hazard mitigation needs of the damaged facilities. These figures are summarized in Table 6-1 below.

Harris County Social Services Network Structural Unmet Needs	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$5,845,110	\$401,200	\$6,246,310	\$2,263,000	\$3,983,310
Flood	\$2,229,000	\$35,507,502	\$37,736,502	\$378,000	\$37,358,502
Surge	\$1,120,000	\$300,700	\$1,420,700	\$378,000	\$1,042,700
Not yet classified	\$9,434,359	\$221,000	\$9,655,359	\$5,000	\$9,650,359
2008 Service Needs	\$41,600,000		\$41,600,000		\$41,600,000
2009 Needs	\$200,000,000		\$200,000,000		\$200,000,000
TOTAL	\$260,228,469	\$36,430,402	\$296,658,871	\$3,024,000	\$293,634,871

Table 6-1
Harris County Social Services Network Structural Unmet Needs



These figures represent roughly a quarter (22%) of the Harris County Social Services network. Assuming that those surveyed reflect the population of service providers and their damages, a conservative figure for unmet needs to recover from damage to social services buildings is \$84 million plus an additional \$36 million for hazard mitigation needs totaling \$120 million.

6.1.2 Increased Client Services

Hurricane Ike caused a significant disruption in the lives of over 4 million people in Harris County. Over 1 million of Centerpoint Energy's clients were without power for several days and over half for more than one week. This disruption increased distress in people's lives which led to a greater demand for social services. Over half of the agencies surveyed saw an immediate increase in number of clients served in the four months following the hurricane (489,863 new clients reported). Responders reported client need for temporary housing, home repair and debris removal, perishable food items, clothing and household goods, childcare services, and deposits on services as a result of a forced move, as well as mental health and substance abuse services. Survey responders reported that \$41.6 million in unreimbursed expenses were incurred providing services to Hurricane Ike victims. Over the long-term, these social service agencies project over 350,000 additional clients in 2009 as a result of Hurricane Ike, resulting in a total cost over the next year of over \$200 million (assuming surveyed average cost per client of \$624).

6.2 Health Care and Mental Health Network

With the damage and closure of healthcare facilities within Galveston County, Harris County's healthcare network was called upon to serve thousands of patients displaced by Hurricane Ike. Many of these facilities provided care after significant damage to their own buildings. Harris County is a national hub of hospitals, medical research facilities, and clinics and is home to 59 acute care hospitals with approximately 15,000 licensed beds and 11,000-staffed beds. The county is also home to the Texas Medical Center, whose combined facilities and clinics account for over 6,000 beds. The major hospital systems in the region are Hermann-Memorial Healthcare System, Methodist Hospital and Texas Children's Hospital. Each of these and other hospitals and clinics saw dramatic increases in demand for patient services in the months following the hurricane.

Projected unmet needs for structural damage, critical hazard mitigation, and ruined medical equipment are estimated to exceed \$171 million.

Increased services as a result of Hurricane Ike resulted in over \$29 million in uncompensated services. That figure is estimated to exceed \$40 million in 2009 for a total unmet need of \$69 million.

With the assistance of the Harris County Healthcare Alliance, a survey was conducted of 30 agencies representing 50 locations countywide. These agencies reported damages to buildings and equipment, loss of supplies, and an increase in uncompensated client demand which is creating both short- and long-term negative impacts to their organization as a direct result of Hurricane Ike.

6.2.1 Damage to Structures, Equipment and Supplies

During the survey, responders were asked about damages to their facilities due to the Hurricane. The total estimated cost was \$103.1 million with approximately \$59.7 million reimbursable by FEMA or insurance, leaving \$43.3 million in possible unmet needs. Of those uncompensated damages, 75% were reported as emergency or high/critical need. The survey also asked facilities to evaluate possible hazard



mitigation projects for their facilities. Responders identified \$81.8 million in hazard mitigation projects for such activities as upgrading roofs and windows, elevating central electrical equipment, installing auxiliary power sources and pumps, and installing backup potable water and sewage backup prevention systems. These figures are summarized in Table 6-2 below.

Harris County Cause of Damage Summary	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$64,973,089	\$20,506,538	\$85,479,627	\$46,470,649	\$39,008,978
Flood	\$21,833,669	\$61,285,000	\$83,118,669	\$0	\$83,118,669
Surge	\$0		\$0	\$0	\$0
Not yet classified	\$16,246,835	\$10,000	\$16,256,835	\$12,743,737	\$3,513,098
Special needs housing & equipment	\$56,150,000	0	\$56,150,000	\$10,500,000	\$45,650,000
TOTAL	\$159,203,593	\$81,801,538	\$241,005,131	\$69,714,386	\$171,290,745

Table 6-2
Harris County Cause of Damage Summary

Responders also reported on the loss of equipment and supplies due to the Hurricane. Harris County facilities lost over \$17.8 million in medical equipment with only \$3.1 million reimbursed by FEMA and insurance, leaving \$14.7 million in unmet needs. Facilities reported losses of \$11.1 in supplies with \$7.4 million reimbursed from FEMA and insurance, leaving \$3.7 million in unmet need.

6.2.2 Increased Client Services

Hurricane Ike caused a significant disruption in the lives of over 4 million residents of Harris County, especially those in the surge zone who were asked to evacuate. Add to this, evacuees from other coastal counties and communities such as Galveston where over 50,000 residents were placed under evacuation orders. Patients of evacuated coastal medical centers made their way to inland facilities in Harris County.

During the survey, facilities were asked to report on increased services, particularly uncompensated health and mental health services. Responders reported serving 14,233 additional patients without healthcare coverage which resulted in a cost of over \$29 million in uncompensated services. With the closure of several regional medical centers in Galveston County post storm it is expected that Harris County facilities will continue to see a rise in the number of uncompensated cases in 2009, especially in light of new facility closures along the gulf coast due to hurricane damage coupled with a slow-down in the economy. Responders were asked to project the effect of this increase on their network. They projected 23,322 displaced patients will seek medical care in Harris County facilities resulting in \$40 million in uncompensated services.



7 Area Profiles

7.1 Harris County Precincts

Various administrative divisions of Harris County, Texas are distributed amongst the County's four Precincts. Precincts 1 through 4 are headed by County Commissioners, elected to serve four-year terms. The County Commissioners sit on the Harris County Commissioners Court, the administrative head of County Government.

All County Precincts and Commissioners have the primary charge of maintaining the administration and operation of parks, roads, and bridge projects. Part of the Precincts' additional responsibilities in providing quality and accessible county services, includes assessing and addressing the needs of their communities in times of natural disasters. **Figure 7-1** shows the geographical boundaries of each precinct. This section describes the total infrastructure damages and needs of each precinct. The collected housing data is not distinguishable between Harris County and the City of Houston by Precinct. Therefore housing is not presented in this section.

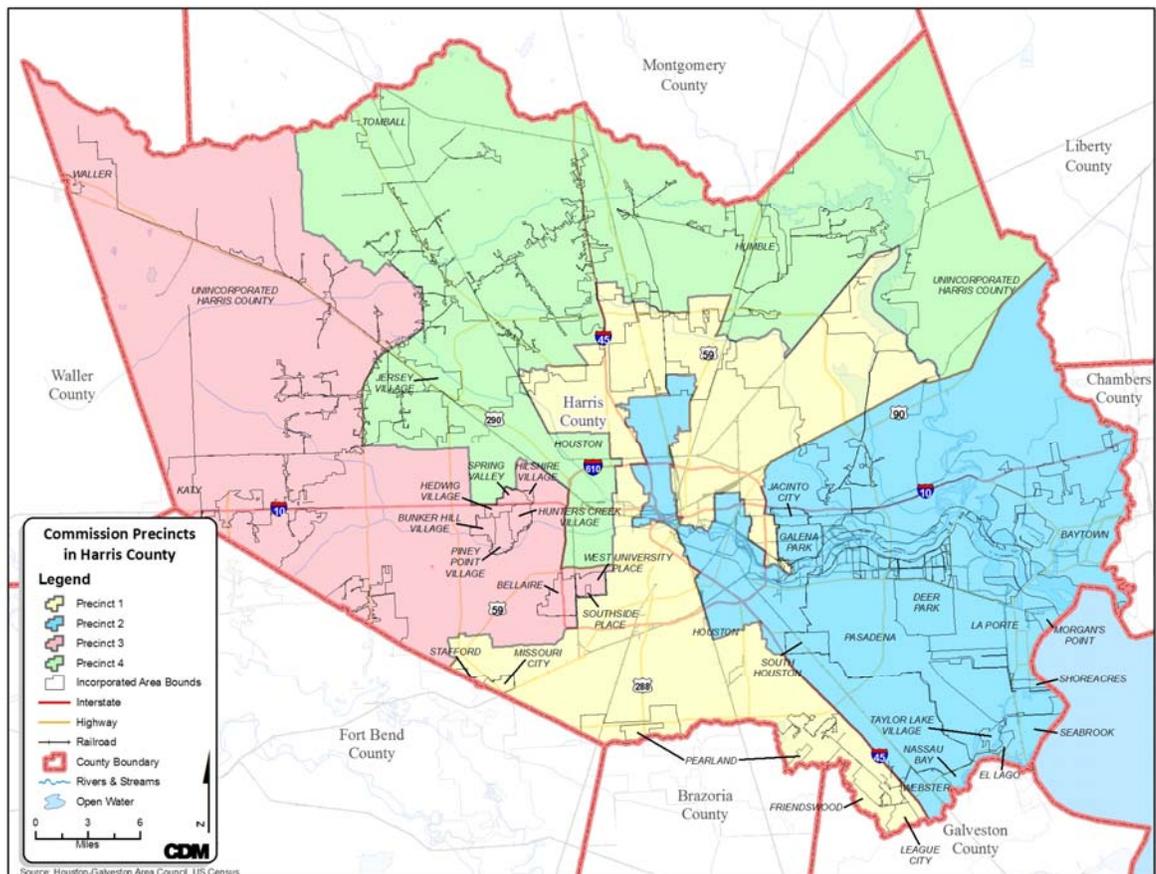
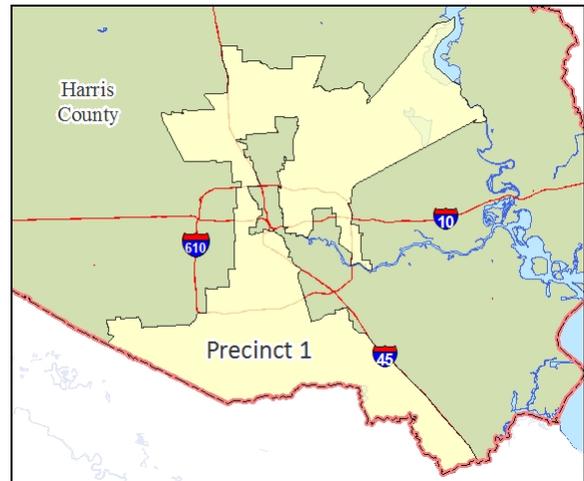


Figure 7-1
Commission Precincts in Harris County



7.1.1 Precinct 1

Harris County Precinct 1 covers more than 323 square miles throughout southwest Harris County and has a population of more than 827,000 people. It is home to 26 parks, including Finnigan Park, and seven hike and bike trails. Precinct 1 has eight community centers, with two more under construction, and three libraries. The Street Olympics Corporation is an umbrella program that incorporates health, education and recreation programs for more than 5,000 youngsters since its debut in 1986. Senior programs sponsored by Precinct 1 include exercise classes, arts and crafts, music and theater classes, field trips and an annual Health and Fitness Day. Precinct 1 community centers serve a vital role in the precinct for hosting various business, economic and social events.



Hurricane Ike resulted in approximately \$32.8 million in infrastructure damage and identification of \$21.9 million in needed hazard mitigation projects. Projects primarily consist of repairs to damaged parks and buildings, although a major new project in Friendswood is the construction of a new Fire Station, at a cost of approximately \$4.5 million.

Itemized damage by category is shown in the table below:

Harris County Precinct 1 Infrastructure Category	Repair and New Projects	Hazard Mitigation Needs	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$325,000	\$0	\$325,000	\$0	\$325,000
Sewer	\$23,000	\$800,000	\$823,000	\$0	\$823,000
Drainage	\$0	\$5,370,000	\$5,370,000	\$0	\$5,370,000
Buildings	\$8,012,034	\$1,275,000	\$9,287,034	\$315,544	\$8,971,490
Equipment	\$1,429	\$0	\$1,429	\$1,072	\$357
Generators	\$0	\$14,360,055	\$14,360,055	\$0	\$14,360,055
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$2,271,824	\$36,000	\$2,307,824	\$561,745	\$1,746,079
Subtotal	\$10,633,287	\$21,841,055	\$32,474,342	\$878,360	\$31,595,981
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Educational Facilities	\$22,189,364	\$70,000	\$22,259,364	\$8,533,428	\$13,725,936
TOTAL	\$32,822,650	\$21,911,055	\$54,733,705	\$9,411,788	\$45,321,917

Table 7-1
Harris County Precinct 1 Infrastructure Damage Summary



The breakdown by damage type is shown in the table below:

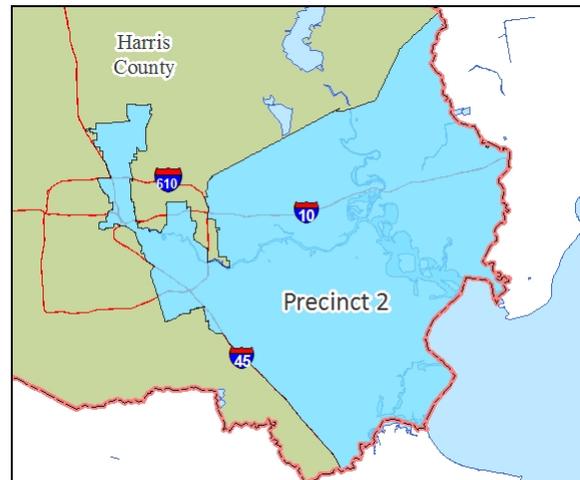
Precinct 1 Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$16,732,763	\$1,415,000	\$18,147,763	\$2,522,675	\$15,625,088
Flood	\$3,000,000	\$0	\$3,000,000	\$3,000,000	\$0
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$13,089,887	\$20,496,055	\$33,585,942	\$3,889,113	\$29,696,829
TOTAL	\$32,822,650	\$21,911,055	\$54,733,705	\$9,411,788	\$45,321,917

Table 7-2
Harris County Precinct 1 Cause of Damage Summary



7.1.2 Precinct 2

Harris County Precinct 2 encompasses approximately 416 square miles throughout southeast Harris County and has a population of more than 800,000 people. It is home to 39 parks located covering 4,000 acres, which include 14 miles of walking trails. Community Centers have become the heart of many communities in Precinct 2. The eight community centers located throughout provide accommodations for wedding receptions, luncheons, aerobics, and senior citizens' events. The East Harris County Activity Center and the Bay Area Community Center originated from a dedicated joint effort between the County and the Community. One of our most popular activities is the Senior Citizen Olympics held annually throughout the Precinct. These fun-filled events provide both social and physical interaction among senior citizens. The Nursing Home Program is designed to improve the quality of life for the residents in long-term care facilities by bringing the community into the nursing home.



Precinct 2 is also proud to be the home of several historical pieces of infrastructure. The Washburn Tunnel opened in 1950 as convenient pathway under the Houston Ship Channel. It is the South's largest and first toll-free vehicular tunnel. Six major operations were required to successfully construct the Tunnel. First, a trench 90 x 40 feet had to be dug. Second, large cement sections had to be locked into position 85 feet under water. Finally, the last touches, such as tiling the inside, were completed.

Another vital and historical piece of infrastructure located in Precinct 2 is the Lynchburg Ferry. Service started in 1888 and continues through today. There is no charge for the ferries' 16 hours, 7 days a week service. This vital service provides reliable transportation across the Houston Ship Channel.

Precinct 2 sustained the most damage of the Harris County Precincts. This includes \$472.1 million in repair and new projects and \$646.1 million hazard mitigation projects. Although not all damage was categorized, a significant amount seems to have been caused by flood and surge. Notable projects include significant water and wastewater infrastructure repairs and improvements in many of the cities located in Precinct 2.

All reported damage, HMGP, and new projects for Navigation and Waterways Infrastructure and for Utility Infrastructure was reported in Precinct 2.

Itemized damage by category is shown in the table below:

Precinct 2 Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$18,321,659	\$39,565,800	\$57,887,459	\$488,920	\$57,398,539
Sewer	\$83,893,569	\$151,289,750	\$235,183,319	\$630,236	\$234,553,083
Drainage	\$28,784,398	\$123,026,190	\$151,810,588	\$92,284	\$151,718,304
Buildings	\$79,190,723	\$85,121,000	\$164,311,723	\$3,198,297	\$161,113,426
Equipment	\$6,116,068	\$3,025,000	\$9,141,068	\$6,611	\$9,134,457
Generators	\$244,284	\$41,938,930	\$42,183,214	\$0	\$42,183,214
Other Infrastructure	\$26,840,619	\$24,775,000	\$51,615,619	\$546,139	\$51,069,480
Debris Removal	\$4,158,408	\$0	\$4,158,408	\$4,119,340	\$39,068
Parks, Recreational Facilities	\$2,567,897	\$11,577,400	\$14,145,297	\$529,041	\$13,616,255
Subtotal	\$250,117,624	\$480,319,070	\$730,436,695	\$9,610,868	\$720,825,826
Navigation and Waterways	\$72,011,945	\$73,952,500	\$145,964,445	\$245,977	\$145,718,468
Transportation	\$100,482,442	\$67,066,400	\$167,548,842	\$95,333	\$167,453,509
Utility Infrastructure	\$25,240,356	\$12,377,000	\$37,617,356	\$15,154	\$37,602,202
Educational Facilities	\$24,280,910	\$12,350,000	\$36,630,910	\$8,526,892	\$28,104,018
TOTAL	\$472,133,277	\$646,064,970	\$1,118,198,248	\$18,494,224	\$1,099,704,024

Table 7-3
Harris County Precinct 2 Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

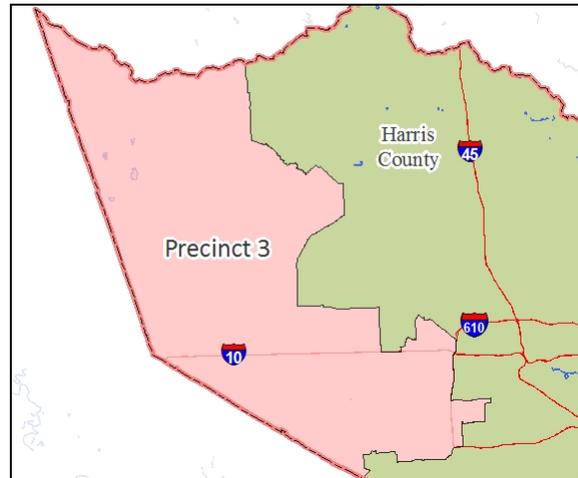
Precinct 2 Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$49,449,760	\$34,874,300	\$84,324,060	\$5,912,571	\$78,411,488
Flood	\$40,161,181	\$112,731,455	\$152,892,636	\$3,990,607	\$148,902,029
Surge	\$140,351,288	\$235,801,330	\$376,152,618	\$2,503,447	\$373,649,172
Other	\$242,171,049	\$262,657,885	\$504,828,934	\$6,087,599	\$498,741,335
TOTAL	\$472,133,277	\$646,064,970	\$1,118,198,248	\$18,494,224	\$1,099,704,024

Table 7-4
Harris County Precinct 2 Cause of Damage Summary



7.1.3 Precinct 3

Harris County Precinct 3 encompasses 464 square miles and has more than 1,000,000 residents. It is one of the fastest growing and most diverse areas in the region, containing both large segments of rural agricultural land and densely populated pockets of urban growth. Approximately 319 square miles are comprised of unincorporated areas of Harris County while the balance of 145 square miles are located in incorporated areas. There are 56 parks and 6 hike and bike trails covering approximately 12,918 acres of land that are operated and maintained by the Precinct's Parks Division. There are 6 community centers receiving over 300,000 visitors annually.



Seven independent school districts provide elementary and secondary education services in Precinct 3. Two community college systems have campuses in the Precinct. Residents have easy access to numerous private and state universities, law schools, and medical schools. In addition, the Precinct operates an award winning education center for senior citizens in cooperation with area non-profit organizations and universities.

Hurricane Ike resulted in the identification of \$8.6 million in repair and new projects and \$106.0 million in potential hazard mitigation projects in Precinct 3. Several large drainage projects including those for the cities of West University, Hilshire Village, and Southside Place total over \$12 million. Damage in Precinct 3 was primarily attributed to wind.

Itemized damage by category is shown in the table below:

Harris County Precinct 3 Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$0	\$401,000	\$401,000	\$0	\$401,000
Sewer	\$0	\$1,447,640	\$1,447,640	\$0	\$1,447,640
Drainage	\$0	\$41,500,000	\$41,500,000	\$0	\$41,500,000
Buildings	\$61,345	\$20,973,416	\$21,034,761	\$44,392	\$20,990,368
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$41,649,110	\$41,649,110	\$0	\$41,649,110
Other Infrastructure	\$0	\$0	\$0	\$0	\$0

Table 7-5
Harris County Precinct 3 Infrastructure Damage Summary



Harris County Precinct 3 Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Debris Removal	\$97,250	\$0	\$97,250	\$50,738	\$46,512
Parks, Recreational Facilities	\$38,517	\$0	\$38,517	\$30,445	\$8,072
Subtotal	\$197,112	\$105,971,166	\$106,168,278	\$125,576	\$106,042,702
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$2,925	\$0	\$2,925	\$0	\$2,925
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Educational Facilities	\$8,420,148	\$20,000	\$8,440,148	\$6,175,818	\$2,264,330
TOTAL	\$8,620,184	\$105,991,166	\$114,611,350	\$6,301,394	\$108,309,957

Table 7-5
Harris County Precinct 3 Infrastructure Damage Summary - Continued

The breakdown by damage type is shown in the table below:

Harris County Precinct 3 Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$8,514,322	\$3,061,900	\$11,576,222	\$6,221,998	\$5,354,225
Flood	\$0	\$6,250,000	\$6,250,000	\$0	\$6,250,000
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$105,862	\$96,679,266	\$96,785,128	\$79,396	\$96,705,732
TOTAL	\$8,620,184	\$105,991,166	\$114,611,350	\$6,301,394	\$108,309,957

Table 7-6
Harris County Precinct 3 Cause of Damage Summary



7.1.4 Precinct 4

Harris County Precinct 4 includes nearly 600 square mile which represent nearly a third of the overall county by area and has over 900,000 residents. Maintenance and construction of nearly 3,000 miles of roads representing over 45 percent of the total Harris County road miles is one of the many vital services Precinct 4 successfully manages. Precinct 4 also has 9.7 miles of bridges, which represents 41 percent of all bridge miles in Harris County. Precinct 4 is also home to eight full service libraries and 23 outstanding parks encompassing over 3,000 acres.



Hurricane Ike resulted in \$16.0 million in repair and new projects and identification of \$146.6 million in hazard mitigation projects in Precinct 4. The Jersey Village channel drainage project accounts for \$8.4 million of the repair and new project costs. Other hazard mitigation drainage projects in Jersey Village, Tomball, and Humble account for over \$18 million. Damage in Precinct 4 was primarily due to wind.

Itemized damage by category is shown in the table below:

Harris County Precinct 4 Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$77,607	\$175,000	\$252,607	\$34,220	\$218,387
Sewer	\$207,365	\$757,500	\$964,865	\$112,309	\$852,556
Drainage	\$8,401,760	\$56,110,000	\$64,511,760	\$0	\$64,511,760
Buildings	\$391,814	\$0	\$391,814	\$295,395	\$96,418
Equipment	\$13,640	\$35,300	\$48,940	\$10,230	\$38,710
Generators	\$62,389	\$89,043,623	\$89,106,012	\$56,248	\$89,049,765
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$250	\$0	\$250	\$0	\$250
Parks, Recreational Facilities	\$908,773	\$0	\$908,773	\$681,580	\$227,193
Subtotal	\$10,063,597	\$146,121,423	\$156,185,020	\$1,189,981	\$154,995,039
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$68,910	\$0	\$68,910	\$4,058	\$64,852
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Educational Facilities	\$5,862,128	\$458,233	\$6,320,361	\$880,109	\$5,440,252
Total	\$15,994,635	\$146,579,656	\$162,574,291	\$2,074,149	\$160,500,143

Table 7-7
Harris County Precinct 4 Infrastructure Damage Summary



The breakdown by damage type is shown in the table below:

Harris County Precinct 4 Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$6,686,054	\$960,533	\$7,646,587	\$1,674,613	\$5,971,974
Flood	\$22,392	\$5,585,000	\$5,607,392	\$5,693	\$5,601,700
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$9,286,189	\$140,034,123	\$149,320,312	\$393,844	\$148,926,469
TOTAL	\$15,994,635	\$146,579,656	\$162,574,291	\$2,074,149	\$160,500,143

Table 7-8
Harris County Precinct 4 Cause of Damage Summary



7.1.5 Combined Harris County Projects

A large number of projects cannot be categorized into one particular precinct due to the project's common benefit for all precincts. The summary of these projects can be seen in the tables below. These damage and new projects totals \$52.9 million. The hazard mitigation projects total \$600.9 million. These mutually beneficial projects include:

- ▼ Medical Special Needs Last Resort Facility
- ▼ Flood Mitigation for North Channel Bypass
- ▼ New Drainage Projects
- ▼ Bridge Replacement
- ▼ Traffic Signal Backup Power

Itemized damage by category is shown in the table below:

Harris County Precinct All Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$0	\$0	\$0	\$0	\$0
Sewer	\$0	\$0	\$0	\$0	\$0
Drainage	\$0	\$212,250,000	\$212,250,000	\$0	\$212,250,000
Buildings	\$1,658,831	\$9,165,000	\$10,823,831	\$119,123	\$10,704,708
Equipment	\$25,199	\$247,000	\$272,199	\$8,431	\$263,768
Generators	\$0	\$164,286,000	\$164,286,000	\$0	\$164,286,000
Other Infrastructure	\$12,307,217	\$4,465,000	\$16,772,217	\$12,125,217	\$4,647,000
Debris Removal	\$30,639,435	\$0	\$30,639,435	\$30,639,435	\$0
Parks, Recreational Facilities	\$4,522	\$0	\$4,522	\$3,392	\$1,131
Subtotal	\$44,635,204	\$390,413,000	\$435,048,204	\$42,895,598	\$392,152,606
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$3,239,457	\$206,000,000	\$209,239,457	\$2,075	\$209,237,383
Utility Infrastructure	\$0	\$4,500,000	\$4,500,000	\$0	\$4,500,000
Educational Facilities	\$5,046,706	\$0	\$5,046,706	\$3,625,678	\$1,421,028
Total	\$52,921,367	\$600,913,000	\$653,834,367	\$46,523,350	\$607,311,017

Table 7-9
Harris County Precinct All Infrastructure Damage Summary



The breakdown by damage type is shown in the table below:

Harris County Precinct All Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$25,728,853	\$0	\$25,728,853	\$24,626,813	\$1,102,040
Flood	\$3,236,691	\$0	\$3,236,691	\$0	\$3,236,691
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$23,955,823	\$600,913,000	\$624,868,823	\$21,896,537	\$602,972,286
TOTAL	\$52,921,367	\$600,913,000	\$653,834,367	\$46,523,350	\$607,311,017

Table 7-10
Harris County Precinct All Cause of Damage Summary



7.2 Harris County Governments

There are numerous projects throughout the county for which different levels, divisions, and departments of the Harris County Government are responsible. All County Precincts and Commissioners have the primary responsibility of maintaining the administration and operation of parks, roads, and bridge projects. The County is also responsible for providing certain public services and disaster response. There is \$65.3 million in new or repair projects that are under the County's control. There are also \$805.4 million in proposed hazard mitigation projects for which they are responsible. Some examples of these types of projects include:

- ▼ Jersey Village Channel Project
- ▼ Clear Lake Park Pier
- ▼ Various Building Repair or Other Improvements at County Park Facilities

Itemized damage by category is shown in the table below:

Harris County Governments Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$345,426	\$500,000	\$845,426	\$1,070	\$844,357
Sewer	\$37,802	\$800,000	\$837,802	\$0	\$837,802
Drainage	\$8,642,298	\$365,695,000	\$374,337,298	\$40,534	\$374,296,764
Buildings	\$5,420,216	\$31,473,416	\$36,893,632	\$1,015,794	\$35,877,838
Equipment	\$40,268	\$397,000	\$437,268	\$19,732	\$417,535
Generators	\$62,389	\$180,109,625	\$180,172,014	\$56,248	\$180,115,767
Other Infrastructure	\$12,310,122	\$4,465,000	\$16,775,122	\$12,127,395	\$4,647,726
Debris Removal	\$30,642,358	\$0	\$30,642,358	\$30,641,627	\$731
Parks, Recreational Facilities	\$4,239,556	\$11,463,400	\$15,702,956	\$1,133,413	\$14,569,543
Subtotal	\$61,740,434	\$594,903,441	\$656,643,875	\$45,035,814	\$611,608,062
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$3,390,625	\$206,000,000	\$209,390,625	\$87,127	\$209,303,498
Utility Infrastructure	\$130,000	\$4,500,000	\$4,630,000	\$0	\$4,630,000
Educational Facilities	\$65,261,059	\$805,403,441	\$870,664,500	\$45,122,941	\$825,541,560
Total	\$61,740,434	\$594,903,441	\$656,643,875	\$45,035,814	\$611,608,062

Table 7-11
Harris County Governments Infrastructure Damage Summary



The breakdown by damage type is shown in the table below:

Harris County Governments Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$24,433,334	\$1,415,000	\$25,848,334	\$22,915,146	\$2,933,188
Flood	\$4,286,896	\$250,000	\$4,536,896	\$251,107	\$4,285,789
Surge	\$1,036,048	\$8,325,000	\$9,361,048	\$297,477	\$9,063,572
Other	\$35,504,781	\$795,413,441	\$830,918,222	\$21,659,211	\$809,259,011
TOTAL	\$65,261,059	\$805,403,441	\$870,664,500	\$45,122,941	\$825,541,560

Table 7-12

Harris County Governments Cause of Damage Summary



7.3 Incorporated Harris County

This section provides a brief overview of the compiled data from local Governments and communities within Harris County. Statistical background information for each community was obtained from the U.S. Census Bureau's Fact Sheets for the years 2000 and 2007, using the most recent that was available for each community. All housing data presented in this section was obtained from the Residential Damage Assessment Report published by the Harris County Housing Authority (HCHA), dated December 2008.

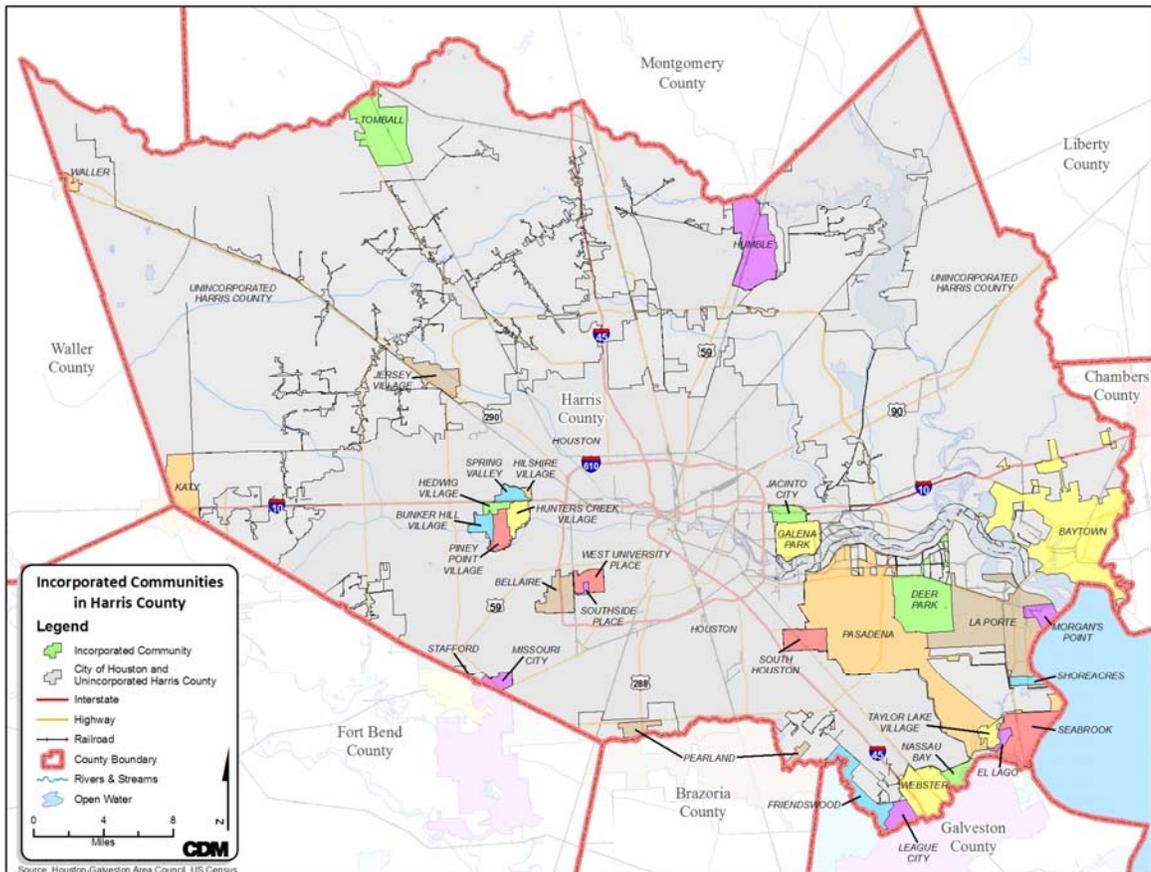
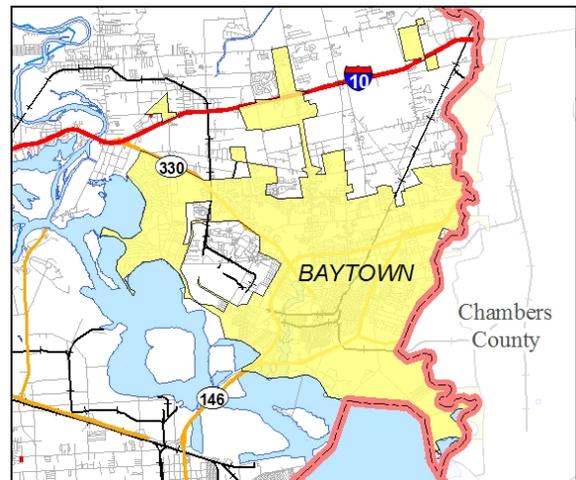


Figure 7-2
Incorporated Communities in Harris County

7.3.1 City of Baytown

The City of Baytown has an estimated population of 69,888 people. Approximately 65.9 percent of the population is classified as being in the labor force. The median household income is \$42,548 per year. A total of 15.1 percent of the residents of Baytown are below the poverty level. The population breaks down into the following major race categories: white (60.3 percent), black or African American (17.6 percent), and Other (19.4 percent). There are a total of 16,656 occupied housing units in the city, with 40.2 percent being rented rather than owned.



7.3.1.1 Housing

The City of Baytown has a total of 16,656 recorded housing units, which include single family, multi-family, and mobile home units, of which 132 housing units were damaged enough to be categorized at Levels 4 and 3, uninhabitable. The projected, total residential damage amount for the City of Baytown stands at \$147 million. In addition, data from the damage assessment projects the temporary housing need for those displaced in Baytown at 132 households.

The Overall Damage Levels presented in the table below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Baytown. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$1,283,363,454	16,382	5,591	10,116	543	124	8	\$127,192,483
Multi-Family	\$150,532,515	251	44	80	127	0	0	\$19,422,605
Mobile Homes	\$1,211,990	23	6	15	2	0	0	\$226,300
City Total	\$1,435,107,959	16,656	5,641	10,211	672	124	8	\$146,841,388

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-13
City of Baytown Summary of Damage by Housing Unit Type

The City of Baytown also performed inspections that resulted in damage assessments. Some of the city's damage assessment figures differ from Harris County's. Per the city's assessment there were 123 Level 3, major damage, and 60 Level 4, destroyed, single-family units as opposed to 124 and 8 respectively per the County. Also, the city identified 893 multi-family units as Level 3, major damage, where the County has none. These discrepancies may be caused by a difference in the methodology used by the city versus the County.



7.3.1.2 Non-Housing - Infrastructure

The City of Baytown has a total of \$26.2 million in damage or new projects in addition to \$206.9 million in hazard mitigation projects. The highest in damage and new project costs are in buildings and navigation and waterways. The biggest building projects are three related to several fire stations, including equipment for them, all at several million apiece. The majority of hazard mitigation projects are made up of transportation, buildings, and sewage infrastructure. The mitigation projects include \$26 million for preventative road repairs and \$22 and \$20 million for major water and sewer line rehabilitation respectively.

The City of Baytown reported critical infrastructure needs of \$176.7 million. A sample of these are:

- ▼ East District and the Central District Wastewater Treatment Plants
- ▼ Recycle Center
- ▼ Emergency Fuel Services Generator
- ▼ Emergency Satellite Telecommunications System

Itemized damage by category is shown in the table below:

City of Baytown Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$0	\$26,220,000	\$26,220,000	\$0	\$26,220,000
Sewer	\$1,516,000	\$76,100,000	\$77,616,000	\$0	\$77,616,000
Drainage	\$0	\$0	\$0	\$0	\$0
Buildings	\$12,955,956	\$35,736,000	\$48,691,956	\$0	\$48,691,956
Equipment	\$4,178,000	\$2,675,000	\$6,853,000	\$0	\$6,853,000
Generators	\$0	\$17,232,000	\$17,232,000	\$0	\$17,232,000
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$39,100	\$0	\$39,100	\$0	\$39,100
Sutbotal	\$18,689,056	\$157,963,000	\$176,652,056	\$0	\$176,652,056
Navigation and Waterways	\$7,527,500	\$807,500	\$8,335,000	\$0	\$8,335,000
Transportation	\$45,000	\$41,160,000	\$41,205,000	\$0	\$41,205,000
Utility Infrastructure	\$0	\$7,000,000	\$7,000,000	\$0	\$7,000,000
Total	\$26,261,556	\$206,930,500	\$233,192,056	\$0	\$233,192,056

Table 7-14
City of Baytown Infrastructure Damage Summary



The breakdown by damage type is shown in the table below:

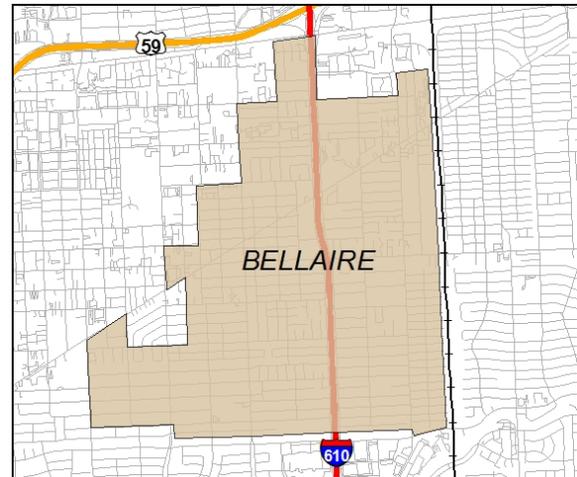
City of Baytown Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$2,072,100	\$7,400,000	\$9,472,100	\$0	\$9,472,100
Flood	\$3,528,000	\$26,000,000	\$29,528,000	\$0	\$29,528,000
Surge	\$20,411,456	\$158,369,000	\$178,780,456	\$0	\$178,780,456
Other	\$250,000	\$15,161,500	\$15,411,500	\$0	\$15,411,500
TOTAL	\$26,261,556	\$206,930,500	\$233,192,056	\$0	\$233,192,056

Table 7-15
City of Baytown Cause of Damage Summary



7.3.2 City of Bellaire

The City of Bellaire has an estimated population of 16,558 people. Approximately 70.5 percent of the population is classified as being in the labor force. The median household income is \$89,775 per year. Bellaire is the 27th wealthiest location in Texas per capita income. A total of 2.6 percent of the residents of Bellaire are below the poverty level. The population breaks down into the following major race categories: white (89.1 percent), black or African American (0.8 percent), and Asian (6.3 percent).



7.3.2.1 Housing

Bellaire has a total of 6,249 housing units, which include single family and multi-family units, of which none were damaged enough to be categorized as Level 4, destroyed, or Level 3, having major damage. Therefore, no Bellaire residential units were found to be uninhabitable. The projected total residential damage amount for the City of Bellaire stands at \$27 million.

The Overall Damage Levels presented in the table below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Bellaire. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$1,511,446,416	6,224	3,460	2,695	69	0	0	\$26,673,651
Multi-Family	\$5,490,991	25	23	2	0	0	0	\$7,995
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$1,516,937,407	6,249	3,483	2,697	69	0	0	\$26,681,646

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-16
City of Bellaire Summary of Damage by Housing Unit Type

7.3.2.2 Non-Housing - Infrastructure

The City of Bellaire has a total of \$900,000 in damage or new projects. The highest in damage and new project costs are in buildings, parks and recreational facilities, and sewage-related projects. The biggest of these projects are damage to a community center and damage to a wastewater treatment plant. Other projects include damage to various important public buildings and water and sewer infrastructure.

The City of Bellaire reported critical infrastructure needs of \$900,000. A sample of these are:

- ▼ Recreation Center
- ▼ Wastewater Treatment Plant
- ▼ Public Works Service Center Facility

Itemized damage by category is shown in the table below:

City of Bellaire Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$44,200	\$0	\$44,200	\$33,150	\$11,050
Sewer	\$149,744	\$0	\$149,744	\$112,309	\$37,435
Drainage	\$0	\$0	\$0	\$0	\$0
Buildings	\$99,171	\$0	\$99,171	\$74,378	\$24,793
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$0	\$0	\$0	\$0
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$605,000	\$0	\$605,000	\$453,750	\$151,250
Subtotal	\$898,115	\$0	\$898,115	\$673,587	\$224,528
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$5,410	\$0	\$5,410	\$4,058	\$1,352
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$903,525	\$0	\$903,525	\$677,645	\$225,880

Table 7-17
City of Bellaire Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

City of Bellaire Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$891,825	\$0	\$891,825	\$668,870	\$222,955
Flood	\$0	\$0	\$0	\$0	\$0
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$11,700	\$0	\$11,700	\$8,775	\$2,925
TOTAL	\$903,525	\$0	\$903,525	\$677,645	\$225,880

Table 7-18
City of Bellaire Cause of Damage Summary



7.3.3 City of Bunker Hill Village

The City of Bunker Hill Village has a population of 3,804. Approximately 50.5% of the population is classified as being in the labor force. The median household income is \$177,274 per year. A total of 3.0% of the residents of Bunker Hill Village are below the poverty level. The population breaks down into the following major race categories: white (91.5%), black or African American (0.2%), Asian (6.5%), and Other (0.5%). There are a total of 1,285 occupied housing units, with 1.8% being rented rather than owned.



7.3.3.1 Housing

The City of Bunker Hill Village is located 10 miles west of Houston. It is one of the Houston-area's top suburbs in which to reside. The community is very proud of its quiet, wooded environment and works hard to preserve its integrity and quality for all residents.

The city was founded in 1954 and through the years has adopted ordinances establishing zoning regulations that have very effectively preserved the characteristics that are so well known as "The Memorial Villages."

Bunker Hill Villages has a total of 1,285 housing units, which include single family units, of which none suffered Level 4 or Level 3 damage. The projected total residential damage amount for the City of Bunker Hill Village stands at \$12.9 million.

The Overall Damage Levels presented in the table below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Bunker Hill Village. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$501,181,924	1,285	616	651	18	0	0	\$12,852,851
Multi-Family	\$0	0	0	0	0	0	0	\$0
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$501,181,924	1,285	616	651	18	0	0	\$12,852,851

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-19
City of Bunker Hill Village Summary of Damage by Housing Unit Type

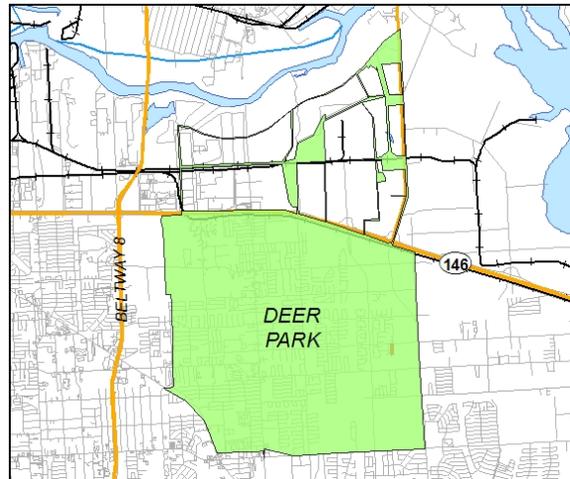
7.3.3.2 Non-Housing - Infrastructure

There were no reported damages to City of Bunker Hill Infrastructure at the time this report was published.



7.3.4 City of Deer Park

The City of Deer Park has an estimated population of 32,506 people. Approximately 72.4 percent of the population is classified as being in the labor force. The median household income is \$72,980 per year. A total of 6.5 percent of the residents of Deer Park are below the poverty level. The population breaks down into the following major race categories: white (89.4 percent), black or African American (2.6 percent), and Other (4.8 percent). There are a total of 9,322 occupied housing units in the city, with 19.5 percent being rented rather than owned.



7.3.4.1 Housing

Deer Park has a total of 9,322 housing units, which include single family, multi-family, and mobile home units, of which one suffered Level 4 damage and was destroyed and 72 units were damaged enough to be categorized as Level 3, uninhabitable. The projected total residential damage amount for the City of Deer Park stands at \$104 million. In addition, data from the damage assessment projects the temporary housing need for those displaced in Deer Park at 93 households.

The Overall Damage Levels presented in the table below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Deer Park. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$1,038,058,014	9,292	3,454	5,269	498	71	0	\$99,661,369
Multi-Family	\$55,000,554	25	13	7	3	1	1	\$4,142,352
Mobile Homes	\$0	5	1	4	0	0	0	\$0
City Total	\$1,093,058,568	9,322	3,458	5,280	501	72	1	\$103,803,721

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-20
City of Deer Park Summary of Damage by Housing Unit Type

7.3.4.2 Non-Housing - Infrastructure

The City of Deer Park has a total of \$4.3 million in damage or new projects in addition to \$12.6 million in hazard mitigation projects. The highest in damage and new project costs were in debris removal and other infrastructure. The majority of hazard mitigation projects are made up of drainage and emergency generator requests. The largest mitigation project is \$8.3 million for a stormwater detention basin for Patrick Bayou. The generators are being requested for various well sites and major public buildings.

The City of Deer Park reported critical infrastructure needs of \$4.3 million. A sample of these are:

- ▼ Additional Radio Repeater Site
- ▼ Public Works
- ▼ Roof/interior damage at transfer station

Itemized damage by category is shown in the table below:

City of Deer Park Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$0	\$0	\$0	\$0	\$0
Sewer	\$0	\$0	\$0	\$0	\$0
Drainage	\$0	\$9,000,000	\$9,000,000	\$0	\$9,000,000
Buildings	\$347,181	\$0	\$347,181	\$90,095	\$257,086
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$3,600,000	\$3,600,000	\$0	\$3,600,000
Other Infrastructure	\$1,567,511	\$0	\$1,567,511	\$474,017	\$1,093,494
Debris Removal	\$2,254,257	\$0	\$2,254,257	\$2,248,007	\$6,250
Parks, Recreational Facilities	\$81,937	\$0	\$81,937	\$61,988	\$19,949
Subtotal	\$4,250,886	\$12,600,000	\$16,850,886	\$2,874,107	\$13,976,779
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$4,250,886	\$12,600,000	\$16,850,886	\$2,874,107	\$13,976,779

Table 7-21
City of Deer Park Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

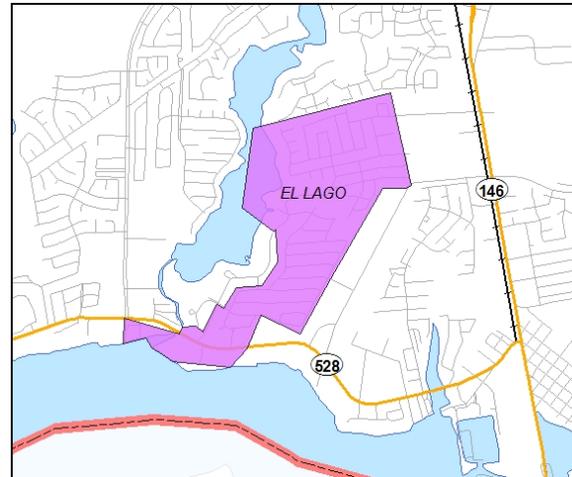
City of Deer Park Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$3,250,886	\$0	\$3,250,886	\$2,874,107	\$376,779
Flood	\$0	\$0	\$0	\$0	\$0
Surge	\$1,000,000	\$12,600,000	\$13,600,000	\$0	\$13,600,000
Other	\$0	\$0	\$0	\$0	\$0
TOTAL	\$4,250,886	\$12,600,000	\$16,850,886	\$2,874,107	\$13,976,779

Table 7-22
City of Deer Park Cause of Damage Summary



7.3.5 City of El Lago

The City of El Lago has an estimated population of 4,123 people. Approximately 64.7 percent of the population is classified as being in the labor force. The median household income is \$66,223 per year. A total of 3.0 percent of the residents of El Lago are below the poverty level. The population breaks down into the following major race categories: white (94.5 percent), black or African American (0.8 percent), and Other (1.4 percent). There are a total of 1,236 occupied housing units in the city, with 26.4 percent being rented rather than owned.



7.3.5.1 Housing

El Lago has a total of 1,236 housing units, which include single family and multi-family, of which two units were damaged enough to be categorized as Level 4, destroyed, with 154 units categorized as Level 3; all were rendered uninhabitable. The projected total residential damage amount for the city of El Lago stands at \$22 million. In addition, data from the damage assessment projects the temporary housing need for those displaced in El Lago at 256 households.

Overall Damage Levels presented in the table below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the city of El Lago. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$132,109,664	930	261	607	51	10	1	\$15,171,413
Multi-Family	\$23,495,679	306	85	36	40	144	1	\$7,259,734
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$155,605,343	1,236	346	643	91	154	2	\$22,431,147

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-23
City of El Lago Summary of Damage by Housing Unit Type

The City of El Lago also performed inspections which resulted in damage assessments. Some of the city's damage assessment figures differ from Harris County's. According to the city's assessment at least 75 multi-family units should be categorized as Level 4 instead of Level 3 since at least five buildings will need to be destroyed. In addition, the city estimates that there are approximately 880 single family housing units instead of the 930 units per the county. These discrepancies may be caused by a difference in the methodology used by the city versus the county.



7.3.5.2 Non-Housing - Infrastructure

The City of El Lago has a total of \$100,000 in damage or new projects in addition to \$2.7 million in hazard mitigation projects. The highest in damage and new project costs were in parks and recreation and utility infrastructure. The biggest of these projects is to replaster a pool. The majority of hazard mitigation projects are made up of buildings and drainage. The major mitigation project is \$2 million to build a community center that will be a shelter and an alternate command center for police and city personnel during a disaster.

Itemized damage by category is shown in the table below:

City of El Lago Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$0	\$0	\$0	\$0	\$0
Sewer	\$0	\$0	\$0	\$0	\$0
Drainage	\$0	\$500,000	\$500,000	\$0	\$500,000
Buildings	\$0	\$2,000,000	\$2,000,000	\$0	\$2,000,000
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$60,000	\$60,000	\$0	\$60,000
Other Infrastructure	\$0	\$50,000	\$50,000	\$0	\$50,000
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$100,000	\$0	\$100,000	\$6,702	\$93,298
Subtotal	\$100,000	\$2,610,000	\$2,710,000	\$6,702	\$2,703,298
Navigation and Waterways	\$0	\$45,000	\$45,000	\$0	\$45,000
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$100,000	\$2,655,000	\$2,755,000	\$6,702	\$2,748,298

Table 7-24
City of El Lago Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

City of El Lago Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$0	\$0	\$0	\$0	\$0
Flood	\$0	\$50,000	\$50,000	\$0	\$50,000
Surge	\$100,000	\$2,605,000	\$2,705,000	\$6,702	\$2,698,298
Other	\$0	\$0	\$0	\$0	\$0
TOTAL	\$100,000	\$2,655,000	\$2,755,000	\$6,702	\$2,748,298

Table 7-25
City of El Lago Cause of Damage Summary



7.3.6 City of Friendswood

The City of Friendswood has an estimated population of 10,334 people. Approximately 66.9 percent of the population is classified as being in the labor force. The median household income is \$86,432 per year. A total of 3.8 percent of the residents of Friendswood are below the poverty level. The population breaks down into the following major race categories: white (85.2 percent), black or African American (2.2 percent), Asian (4.9 percent), and Other (4.9 percent). There are a total of 3,070 occupied housing units in the city, with 20.3 percent being rented rather than owned.



7.3.6.1 Housing

Friendswood has a total of 3,070 housing units, which include single family and multi-family, of which two units were damaged enough to be categorized as Level 4, destroyed and four as Level 3, all uninhabitable. The projected total residential damage amount for the city of Friendswood stands at \$32 million. In addition, data from the damage assessment projects the temporary housing need for those displaced in Friendswood at six households.

The Overall Damage Levels presented in the table below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Friendswood. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$396,087,227	3,062	1,100	1,900	56	4	2	\$29,374,974
Multi-Family	\$41,470,485	8	3	5	0	0	0	\$2,838,408
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$437,557,712	3,070	1,103	1,905	56	4	2	\$32,213,382

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-26
City of Friendswood Summary of Damage by Housing Unit Type

7.3.6.2 Non-Housing - Infrastructure

The City of Friendswood has a total of \$5.5 million in damage or new projects. All of the costs are for damage to buildings or in one case, a proposed new fire station. The new fire station is the largest project in terms of cost at \$4.5 million. The other major project is \$1 million for repairs to be made at Brookside Intermediate.



Itemized damage by category is shown in the table below:

City of Friendswood Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$0	\$0	\$0	\$0	\$0
Sewer	\$0	\$0	\$0	\$0	\$0
Drainage	\$0	\$0	\$0	\$0	\$0
Buildings	\$5,510,000	\$0	\$5,510,000	\$0	\$5,510,000
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$0	\$0	\$0	\$0
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$0	\$0	\$0	\$0	\$0
Subtotal	\$5,510,000	\$0	\$5,510,000	\$0	\$5,510,000
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$5,510,000	\$0	\$5,510,000	\$0	\$5,510,000

Table 7-27
City of Friendswood Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

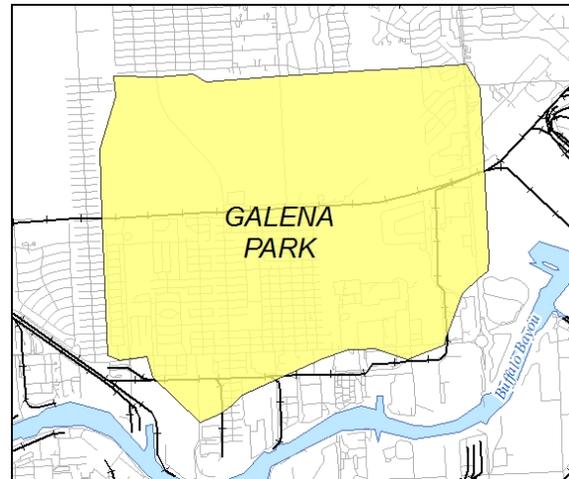
City of Friendswood Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$1,010,000	\$0	\$1,010,000	\$0	\$1,010,000
Flood	\$0	\$0	\$0	\$0	\$0
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$4,500,000	\$0	\$4,500,000	\$0	\$4,500,000
TOTAL	\$5,510,000	\$0	\$5,510,000	\$0	\$5,510,000

Table 7-28
City of Friendswood Cause of Damage Summary



7.3.7 City of Galena Park

The City of Galena Park has an estimated population of 11,053 people. Approximately 52.2 percent of the population is classified as being in the labor force. The median household income is \$31,660 per year. A total of 25.4 percent of the residents of Galena Park are below the poverty level. The population breaks down into the following major race categories: white (63.3 percent), black or African American (7.6 percent), and Other (24.3 percent). There are a total of 2,894 occupied housing units in the city, with 27.1 percent being rented rather than owned.



7.3.7.1 Housing

Galena Park has a total of 2,894 housing units, which include single family and multi-family, of which four units were destroyed and categorized as Level 4, and 84 units were categorized as Level 3, all uninhabitable. The projected total residential damage amount for the city of Galena Park stands at \$19 million. In addition, data from the damage assessment projects the temporary housing need for those displaced in Galena Park at 113 households.

The Overall Damage Levels presented in the table below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Galena Park. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$170,512,258	2,876	1,216	1,224	349	83	4	\$18,617,156
Multi-Family	\$2,795,601	18	8	5	4	1	0	\$572,915
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$173,307,859	2,894	1,224	1,229	353	84	4	\$19,190,071

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-29
City of Galena Park Summary of Damage by Housing Unit Type

7.3.7.2 Non-Housing - Infrastructure

The City of Galena Park has a total of \$140,000 in damage or new projects in addition to \$2.6 million in hazard mitigation projects. The only damage project is to repair a water treatment plant. The majority of hazard mitigation projects are emergency generators for community centers, but the most expensive project is \$2.3 million for sewer line rehabilitation.



Itemized damage by category is shown in the table below:

City of Galena Park Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$0	\$0	\$0	\$0	\$0
Sewer	\$135,000	\$2,300,000	\$2,435,000	\$0	\$2,435,000
Drainage	\$0	\$0	\$0	\$0	\$0
Buildings	\$0	\$0	\$0	\$0	\$0
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$320,000	\$320,000	\$0	\$320,000
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$0	\$0	\$0	\$0	\$0
Subtotal	\$135,000	\$2,620,000	\$2,755,000	\$0	\$2,755,000
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$135,000	\$2,620,000	\$2,755,000	\$0	\$2,755,000

Table 7-30
City of Galena Park Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

City of Galena Park Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$0	\$160,000	\$160,000	\$0	\$160,000
Flood	\$135,000	\$2,460,000	\$2,595,000	\$0	\$2,595,000
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$0	\$0	\$0	\$0	\$0
TOTAL	\$135,000	\$2,620,000	\$2,755,000	\$0	\$2,755,000

Table 7-31
City of Galena Park Cause of Damage Summary



7.3.8 City of Hedwig Village

The City of Hedwig Village has an estimated population of 2,372 people and is located west of Houston. Approximately 62.7 percent of the population is classified as being in the labor force. The median household income is \$66,250 per year. A total of 4.6 percent of the residents of Hedwig Village are below the poverty level. The population breaks down into the following major race categories: white (81.4 percent), black or African American (1.3 percent), Asian (12.4 percent), and Other (2.0 percent). There are a total of 807 occupied housing units in the city, with 33.7 percent being rented rather than owned.



7.3.8.1 Housing

Like all other communities in Harris County, Hedwig Village had its own experience with the impact of Hurricane Ike, which hit the Texas coast on September 13, 2008. This Hedwig Village individual city assessment provides important and helpful information regarding the damage and effect on residential properties, as well as, the current housing need for the Hedwig Village community, post-Hurricane Ike.

Hedwig Village has a total of 807 housing units, which include single family and multi-family, of which there were none damaged enough to be categorized as Level 4 or 3, either destroyed, or having major damage. The projected total residential damage amount for the City of Hedwig Village stands at \$6.6 million.

The Overall Damage Levels presented in the table below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on Hedwig Village. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$176,209,883	561	204	339	18	0	0	\$6,548,633
Multi-Family	\$14,772,367	246	245	1	0	0	0	\$13,693
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$190,982,250	807	449	340	18	0	0	\$6,562,326

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-32
City of Hedwig Village Summary of Damage by Housing Unit Type

7.3.8.2 Non-Housing - Infrastructure

There were no reported damages to City of Hedwig Village Infrastructure at the time this report was published.



7.3.9 City of Hilshire Village

The City of Hilshire Village has an estimated population of 748 people. Approximately 65.2 percent of the population is classified as being in the labor force. The median household income is \$117,252 per year. A total of 2.5 percent of the residents of Hilshire Village are below the poverty level. The population breaks down into the following major race categories: white (93.9 percent), black or African American (0.4 percent), and Asian (3.3 percent). There are a total of 299 occupied housing units in the city, with 2.1 percent being rented rather than owned.



7.3.9.1 Housing

Hilshire Village has a total of 299 housing units, which include single family units, of which there were none damaged enough to be categorized as Level 4; however, one did suffer Level 3, major damage, making it uninhabitable. The projected total residential damage amount for the City of Hilshire Village stands at \$2.8 million. In addition, data from the damage assessment projects the temporary housing need for those displaced in Hilshire Village at one household.

The Overall Damage Levels presented in the table below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Hilshire Village. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$64,365,816	299	43	243	12	1	0	\$2,795,433
Multi-Family	\$0	0	0	0	0	0	0	\$0
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$64,365,816	299	43	243	12	1	0	\$2,795,433

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-33
City of Hilshire Village Summary of Damage by Housing Unit Type

7.3.9.2 Non-Housing - Infrastructure

The City of Hilshire Village has a total of \$3,000 in damage or new projects in addition to \$2.6 million in hazard mitigation projects. The only damage project is to repair roads throughout the city. The hazard mitigation projects include emergency generators for a sewage lift station and the city office. The largest project at \$2.5 million is to improve drainage at Pine Chase and Glourie Loop.

Itemized damage by category is shown in the table below:

City of Hilshire Village Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$0	\$0	\$0	\$0	\$0
Sewer	\$0	\$20,000	\$20,000	\$0	\$20,000
Drainage	\$0	\$2,500,000	\$2,500,000	\$0	\$2,500,000
Buildings	\$0	\$0	\$0	\$0	\$0
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$35,000	\$35,000	\$0	\$35,000
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$0	\$0	\$0	\$0	\$0
Subtotal	\$0	\$2,555,000	\$2,555,000	\$0	\$2,555,000
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$2,925	\$0	\$2,925	\$0	\$2,925
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$2,925	\$2,555,000	\$2,557,925	\$0	\$2,557,925

Table 7-34
City of Hilshire Village Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

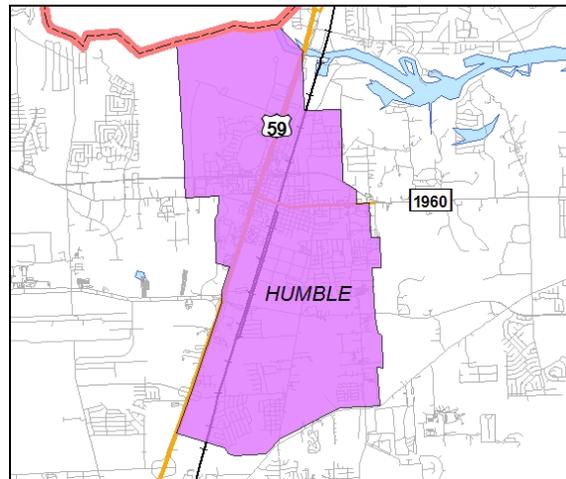
Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$2,925	\$0	\$2,925	\$0	\$2,925
Flood	\$0	\$2,500,000	\$2,500,000	\$0	\$2,500,000
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$0	\$55,000	\$55,000	\$0	\$55,000
TOTAL	\$2,925	\$2,555,000	\$2,557,925	\$0	\$2,557,925

Table 7-35
City of Hilshire Village Cause of Damage Summary



7.3.10 City of Humble

The City of Humble has an estimated population of 16,270 people. Approximately 71.3 percent of the population is classified as being in the labor force. The median household income is \$37,834 per year. A total of 15.5 percent of the residents of Humble are below the poverty level. The population breaks down into the following major race categories: white (69.2 percent), black or African American (14.5 percent), and Other (9.1 percent). There are a total of 2,759 occupied housing units in the city, with 55.0 percent being rented rather than owned.



7.3.10.1 Housing

Humble has a total of 2,759 residential housing units, which include single family, multi-family, and mobile home units, of which none were destroyed (Level 4), or sustained major damage (Level 3). The projected total residential damage amount for the City of Humble stands at more than \$15 million.

The Overall Damage Levels presented in the table below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Humble. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

Overall Damage Levels

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$238,421,536	2,666	1,634	1,025	7	0	0	\$8,883,772
Multi-Family	\$72,701,480	90	36	50	4	0	0	\$6,358,203
Mobile Homes	\$767,798	3	1	2	0	0	0	\$76,780
City Total	\$311,890,814	2,759	1,671	1,077	11	0	0	\$15,318,755

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-36
City of Humble Summary of Damage by Housing Unit Type

7.3.10.2 Non-Housing - Infrastructure

The City of Humble has a total of \$6.1 million in hazard mitigation projects. The majority of hazard mitigation projects are made up of drainage improvements and sewage infrastructure. The largest

mitigation project is to make drainage improvements at Jordan's Gully. There are numerous requests for auxiliary diesel pumps at sewage lift stations. A sample of other projects are:

- ▼ Civic Center Arena Detention Improvements
- ▼ 7th Street Ditch Improvements

Itemized damage by category is shown in the table below:

City of Humble Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$0	\$175,000	\$175,000	\$0	\$175,000
Sewer	\$0	\$757,500	\$757,500	\$0	\$757,500
Drainage	\$0	\$5,110,000	\$5,110,000	\$0	\$5,110,000
Buildings	\$0	\$0	\$0	\$0	\$0
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$65,000	\$65,000	\$0	\$65,000
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$0	\$0	\$0	\$0	\$0
Subtotal	\$0	\$6,107,500	\$6,107,500	\$0	\$6,107,500
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$6,107,500	\$6,107,500	\$0	\$6,107,500

Table 7-37
City of Humble Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

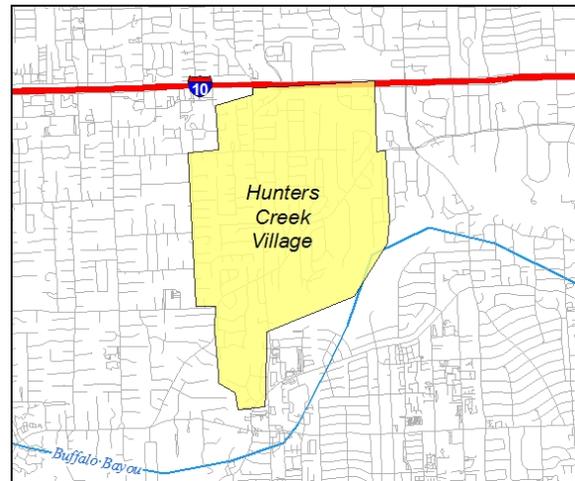
City of Humble Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$0	\$822,500	\$822,500	\$0	\$822,500
Flood	\$0	\$5,285,000	\$5,285,000	\$0	\$5,285,000
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$0	\$0	\$0	\$0	\$0
TOTAL	\$0	\$6,107,500	\$6,107,500	\$0	\$6,107,500

Table 7-38
City of Humble Cause of Damage Summary



7.3.11 City of Hunters Creek Village

The City of Hunters Creek Village has an estimated population of 4,545 people. Approximately 53.3 percent of the population is classified as being in the labor force. The median household income is \$171,294 per year. A total of 1.2 percent of the residents of Hunters Creek Village are below the poverty level. The population breaks down into the following major race categories: white (93.4 percent), black or African American (0.4 percent), Asian (4.8 percent), and Other (0.5 percent). There are a total of 1,509 occupied housing units in the city, with 2.4 percent being rented rather than owned.



7.3.11.1 Housing

Hunters Creek Village was founded in 1954 as a bedroom community for the booming post-war city of Houston. This city of 4,545 residents, which is located just west of Houston, is one of the wealthiest communities in Texas, per capita income.

Though the city is relatively far away from where Hurricane Ike made landfall on September 13, 2008, approximately 30 percent of its 1,509 residential housing units received some form of damage. That translates to 427 residential units. This Hunters Creek Village individual city assessment projects two residential units, as having received major damage and one destroyed and therefore uninhabitable. Like so much of Harris County, Hunters Creek Village experienced high winds, downed trees, and power outages. The city's total residential housing damage amounts to \$8.6 million. Three households were displaced as a result of Hurricane Ike.

The projected total residential damage amount for the city of Hunters Creek Village stands at more than \$8.6 million. In addition, data from the damage assessment projects the temporary housing need for those displaced in Hunters Creek Village at three households.

The Overall Damage Levels presented in the table below are based on the Residential Damage Assessment and provide a snapshot of Hurricane Ike's impact on the city of Hunters Creek Village. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$667,495,907	1,509	1,082	415	9	2	1	\$8,580,957
Multi-Family	\$0	0	0	0	0	0	0	\$0
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$667,495,907	1,509	1,082	415	9	2	1	\$8,580,957

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-39
City of Hunters Creek Village Summary of Damage by Housing Unit Type

The City of Hunters Creek Village also performed inspections which resulted in damage assessments. Per the city's inspection of just over 400 housing units, the number of units categorized as Level 2 should be 10 instead of 9 units and there should be 11 Level 1 instead of 415 per the County's assessment. These discrepancies may be caused by a difference in the methodology used by the city versus the County. In addition, one unit included as uninhabitable (Level 4-destroyed) per the County's assessment was later excluded by the city's assessment. The city cited that there was no habitable unit on the property prior to the storm.

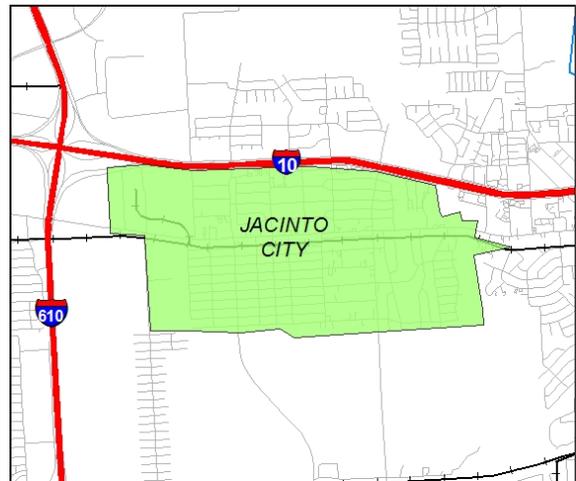
7.3.11.2 Non-Housing - Infrastructure

There were no reported damages to City of Hunters Creek Village Infrastructure at the time this report was published.



7.3.12 Jacinto City

The City of Jacinto City has an estimated population of 11,005 people. Approximately 54.0 percent of the population is classified as being in the labor force. The median household income is \$34,672 per year. A total of 15.8 percent of the residents of Jacinto City are below the poverty level. The population breaks down into the following major race categories: white (68.2 percent), black or African American (1.2 percent), and Other (25.7 percent). There are a total of 2,600 occupied housing units in the city, with 31.7 percent being rented rather than owned.



7.3.12.1 Housing

Jacinto City has a total of 2,600 residential housing units, of which a projected five units were destroyed (Level 4), 53 units sustained major damage (Level 3), and were considered uninhabitable. The projected total residential damage amount for the City of Jacinto City stands at more than \$11 million. In addition, data from the damage assessment projects the temporary housing need for those displaced in Jacinto City at 58 households.

The Overall Damage Levels presented in the table below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on Jacinto City. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$132,266,619	2,575	1,103	1,304	110	53	5	\$10,402,922
Multi-Family	\$7,295,585	20	7	12	1	0	0	\$719,209
Mobile Homes	\$153,950	5	3	2	0	0	0	\$9,816
City Total	\$139,716,154	2,600	1,113	1,318	111	53	5	\$11,131,947

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-40
City of Jacinto City Summary of Damage by Housing Unit Type

7.3.12.2 Non-Housing - Infrastructure

Jacinto City has a total of \$3.5 million in damage or new projects in addition to \$6.2 million in hazard mitigation projects. The highest in damage and new project costs are in buildings. The largest building project is \$2.75 million to build a new police station. The majority of hazard mitigation projects are made up of sewage infrastructure. The largest mitigation project is to construct a new wastewater treatment facility to prevent sewage backups into local homes.

Itemized damage by category is shown in the table below:

Jacinto City Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$0	\$0	\$0	\$0	\$0
Sewer	\$0	\$6,100,000	\$6,100,000	\$0	\$6,100,000
Drainage	\$0	\$0	\$0	\$0	\$0
Buildings	\$3,500,000	\$25,000	\$3,525,000	\$0	\$3,525,000
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$122,000	\$122,000	\$0	\$122,000
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$0	\$0	\$0	\$0	\$0
Subtotal	\$3,500,000	\$6,247,000	\$9,747,000	\$0	\$9,747,000
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$3,500,000	\$6,247,000	\$9,747,000	\$0	\$9,747,000

Table 7-41
Jacinto City Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

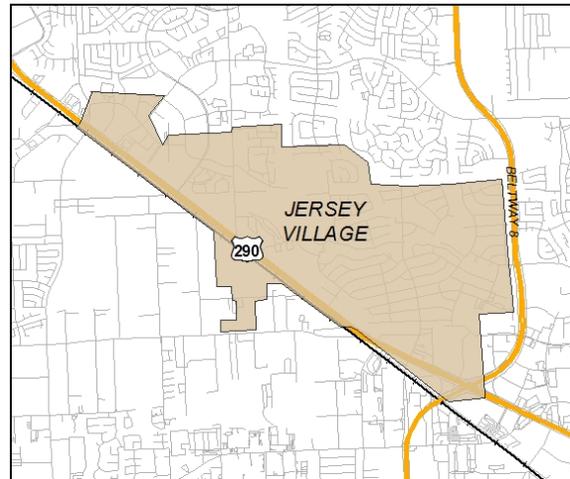
Jacinto City Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$750,000	\$67,000	\$817,000	\$0	\$817,000
Flood	\$2,750,000	\$6,180,000	\$8,930,000	\$0	\$8,930,000
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$0	\$0	\$0	\$0	\$0
TOTAL	\$3,500,000	\$6,247,000	\$9,747,000	\$0	\$9,747,000

Table 7-42
Jacinto City Cause of Damage Summary



7.3.13 City of Jersey Village

The City of Jersey Village has an estimated population of 7,505 people and is located in northwest Harris County. Approximately 77.5 percent of the population is classified as being in the labor force. The median household income is \$68,431 per year. A total of 4.5 percent of the residents of Jersey Village are below the poverty level. The population breaks down into the following major race categories: white (86.6 percent), black or African American (4.1 percent), Asian (5.1 percent), and Other (2.4 percent). There are a total of 2,011 occupied housing units in the city, with 41.0 percent being rented rather than owned.



7.3.13.1 Housing

Jersey Village has a total of 2,011 residential units, of which four sustained Level 2, minor damage and 224 at Level 1, affected damage. The projected, total residential damage amount for the City of Jersey Village stands at more than \$5.9 million.

The Overall Damage Levels presented in the table below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the city of Jersey Village. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$322,648,404	2,006	1,782	220	4	0	0	\$2,661,123
Multi-Family	\$59,439,387	5	1	4	0	0	0	\$3,257,846
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$382,087,791	2,011	1,783	224	4	0	0	\$5,918,969

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

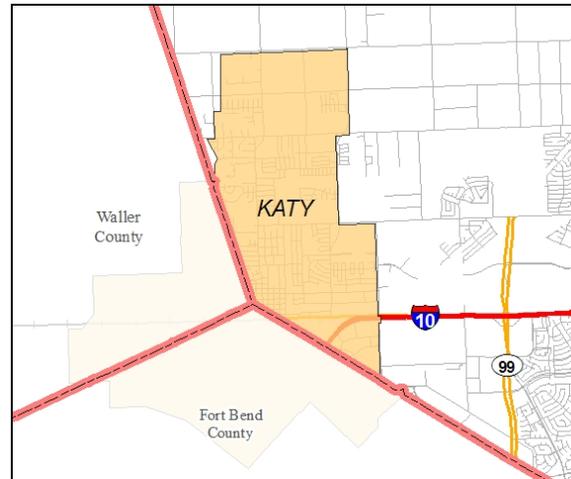
Table 7-43
City of Jersey Village Summary of Damage by Housing Unit Type

7.3.13.2 Non-Housing - Infrastructure

There were no reported damages to City of Jersey Village Infrastructure at the time this report was published.

7.3.14 City of Katy

The City of Katy has an estimated population of 57,777 people. Only 12,687 of those residents live in Harris County. Approximately 68.7 percent of the population is classified as being in the labor force. The median household income is \$51,111 per year. A total of 8.4 percent of the residents of Katy are below the poverty level. The population breaks down into the following major race categories: white (84.0 percent), black or African American (4.2 percent), and Other (8.6 percent). There are a total of 3,018 occupied housing units in Harris County, with 33.8 percent being rented rather than owned.



7.3.14.1 Housing

Katy sits in far Western Harris County where Harris, Waller, and Fort Bend Counties meet. As a result, portions of the city of Katy fall within each of the three counties. The estimated 57,777 residents of Katy are quick to acknowledge the city's farming past, as well as, the rapid urbanization and rising number of residential subdivisions in the area. Of the 57,000+ residents, 12,687 reside in Harris County. This has led to the adoption of the terms "Old Katy" to describe the city and "Katy Area" to describe the booming neighborhoods that lie between Katy and its large neighbor to the east, Houston.

Katy has a total of 3,018 residential units, which include single family, multi-family, and mobile home units, of which one unit suffered Level 4 damage, destroyed and one Level 3, major damage. There were 22 units that suffered Level 2, minor damage and 459 units Level 1, affected damage. The projected, total residential damage amount for the city of Katy stands at more than \$3 million. In addition, data from the damage assessment projects the temporary housing need for those displaced in Katy at two households.

The Overall Damage Levels presented in the table below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Katy. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$316,360,377	2,993	2,519	451	21	1	1	\$2,969,134
Multi-Family	\$7,002,775	13	9	4	0	0	0	\$121,881
Mobile Homes	\$204,522	12	7	4	1	0	0	\$7,103
City Total	\$323,567,674	3,018	2,535	459	22	1	1	\$3,098,118

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-44
City of Katy Summary of Damage by Housing Unit Type

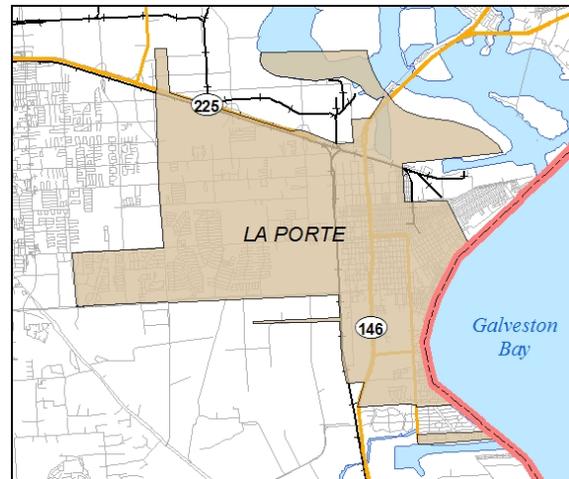
7.3.14.2 Non- Housing - Infrastructure

There were no reported damages to City of Katy Infrastructure at the time this report was published.



7.3.15 City of La Porte

The City of La Porte has an estimated population of 35,755 people. Approximately 68.2 percent of the population is classified as being in the labor force. The median household income is \$69,913 per year. A total of 9.5 percent of the residents of La Porte are below the poverty level. The population breaks down into the following major race categories: white (80.8 percent), black or African American (8.5 percent), and Other (6.2 percent). There are a total of 10,150 occupied housing units in the city, with 22.4 percent being rented rather than owned.



7.3.15.1 Housing

La Porte has a total of 10,150 housing units, which include single family, multi-family and mobile home units, of which 474 units were damaged enough to be categorized as Level 3 or Level 4, rendering them uninhabitable. The projected, total residential damage amount for the City of La Porte stands at approximately \$142.8 million. In addition, data from the damage assessment projects the temporary housing need for those displaced in La Porte at 573 households.

The Overall Damage Levels presented in the table below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of La Porte. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$977,223,300	10,009	2,854	6,179	521	453	2	\$138,183,259
Multi-Family	\$33,151,520	129	72	12	26	19	0	\$4,540,677
Mobile Homes	\$260,185	12	5	4	3	0	0	\$46,759
City Total	\$1,010,635,005	10,150	2,931	6,195	550	472	2	\$142,770,694

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-45
City of La Porte Summary of Damage by Housing Unit Type

The City of La Porte also performed inspections which resulted in damage assessments. Some of the city's damage assessment figures differ from Harris County. La Porte's assessment indicates 41 single family housing units cannot be rebuilt or inhabited until they meet the elevation requirement of 12 feet above base flood elevation. Therefore, a total of 41 housing units would be categorized as Level 4 destroyed instead of only two per the county.



7.3.15.2 Non-Housing - Infrastructure

The City of La Porte has a total of \$1.6 million in damage or new projects. The highest in damage and new project costs were buildings as well as navigation and waterways. The biggest building projects were related to several fire stations, including equipment for them.

The City of La Porte reported critical infrastructure needs of \$4.3 million. A sample of these are:

- ▼ Bay Forest Gold Course
- ▼ Charles Walker Annex
- ▼ Seabreeze Park Picnic Shelter #1
- ▼ Public Works Service Center
- ▼ City Hall

Itemized damage by category is shown in the table below:

City of La Porte Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$32,000	\$0	\$32,000	\$0	\$32,000
Sewer	\$32,400	\$0	\$32,400	\$0	\$32,400
Drainage	\$0	\$0	\$0	\$0	\$0
Buildings	\$349,700	\$0	\$349,700	\$96,648	\$253,052
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$0	\$0	\$0	\$0
Other Infrastructure	\$5,000	\$0	\$5,000	\$0	\$5,000
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$269,500	\$0	\$269,500	\$0	\$269,500
Subtotal	\$688,600	\$0	\$688,600	\$96,648	\$591,952
Navigation and Waterways	\$560,000	\$0	\$560,000	\$0	\$560,000
Transportation	\$350,000	\$0	\$350,000	\$0	\$350,000
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$1,598,600	\$0	\$1,598,600	\$96,648	\$1,501,952

Table 7-46
City of La Porte Infrastructure Damage Summary



The breakdown by damage type is shown in the table below:

City of La Porte Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$619,000	\$0	\$619,000	\$96,648	\$522,352
Flood	\$0	\$0	\$0	\$0	\$0
Surge	\$979,600	\$0	\$979,600	\$0	\$979,600
Other	\$0	\$0	\$0	\$0	\$0
TOTAL	\$1,598,600	\$0	\$1,598,600	\$96,648	\$1,501,952

Table 7-47

City of La Porte Cause of Damage Summary



7.3.16 City of League City

The City of League City has an estimated population of 68,000 people. Approximately 73.5 percent of the population is classified as being in the labor force. The median household income is \$67,838 per year. A total of 4.8 percent of the residents of League City are below the poverty level. The population breaks down into the following major race categories: white (84.0 percent), black or African American (5.1 percent), and Other (5.3 percent). There are a total of 17,280 occupied housing units in the city, with 23.0 percent being rented rather than owned.



7.3.16.1 Housing

League City, a Clear Lake, Bay Area city, sits halfway between the cities of Houston and Galveston, on the Harris/Galveston County line. Approximately 99 League City community members reside in Harris County boundaries. Only a small portion of League City, located west of Interstate 45 and north of Clear Creek, lies within Harris County. As a whole, it is the largest community in Galveston County and is home to several waterside resorts enjoyed by visitors from Houston and across the country.

League City has a total of 85 recorded housing units, within Harris County, of which one unit sustained Level 3, major damage, but there were none at Level 4, destroyed. At Level 2, minor damage, four units sustained damage and 37 units had Level 1, affected damage. The projected, total residential damage amount for this sector of League City stands at more than \$1.1 million. In addition, data from the damage assessment projects the temporary housing need for those displaced in League City at one household.

The Overall Damage Levels presented in the table below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of League City. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$14,995,985	85	43	37	4	1	0	\$1,149,205
Multi-Family	\$0	0	0	0	0	0	0	\$0
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$14,995,985	85	43	37	4	1	0	\$1,149,205

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-48
City of League City Summary of Damage by Housing Unit Type



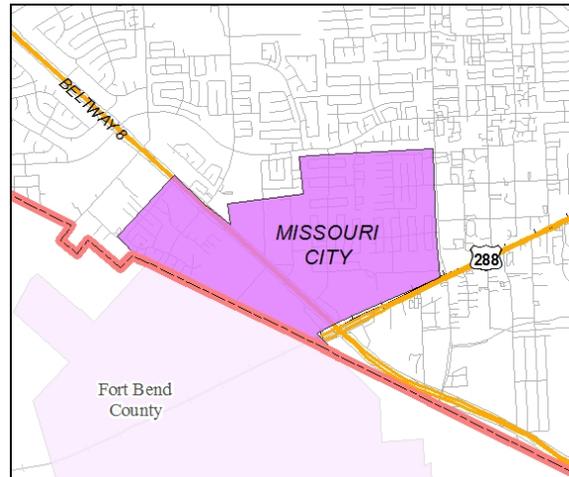
7.3.16.2 Non-Housing - Infrastructure

There were no reported damages to City of League City Infrastructure located in Harris County at the time this report was published.



7.3.17 City of Missouri City

The City of Missouri City has an estimated population of 74,000 people. Only 5,769 people reside in Harris County. Approximately 73.5 percent of the population is classified as being in the labor force. The median household income is \$72,434 per year. A total of 3.3 percent of the residents of Missouri City are below the poverty level. The population breaks down into the following major race categories: white (44.3 percent), black or African American (38.3 percent), Asian (10.6 percent), and Other (4.5 percent). There are a total of 1,788 occupied housing units that lie within Harris County, with 9.2 percent being rented rather than owned.



7.3.17.1 Housing

Missouri City, sits between Houston and Sugar Land in Southwestern Harris County, straddling the Fort Bend County line. Approximately 5,769 Missouri City community members reside in Harris County boundaries. A large portion of the city lies within Fort Bend County, where only a small section lies within Harris County. This damage assessment covers only the portion of Missouri City located within Harris County.

The city's founders envisioned the town as a destination for settlers from St. Louis, Missouri, hence the name, Missouri City; however, the first settlers came from Arlington, Texas.

Missouri City has a total of 1,788 housing units, all single family, of which 16 units sustained Level 3 major damage, rendering them uninhabitable. The projected, total residential damage amount for the portion of Missouri City that lies within Harris County stands at \$18,440,561. In addition, data from the damage assessment projects the temporary housing need for those displaced in Missouri city at 16 households.

The Overall Damage Levels presented in the table listed below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on Missouri City. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$180,518,173	1,788	679	993	100	16	0	\$18,440,561
Multi-Family	\$0	0	0	0	0	0	0	\$0
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$180,518,173	1,788	679	993	100	16	0	\$18,440,561

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-49
City of Missouri City Summary of Damage by Housing Unit Type

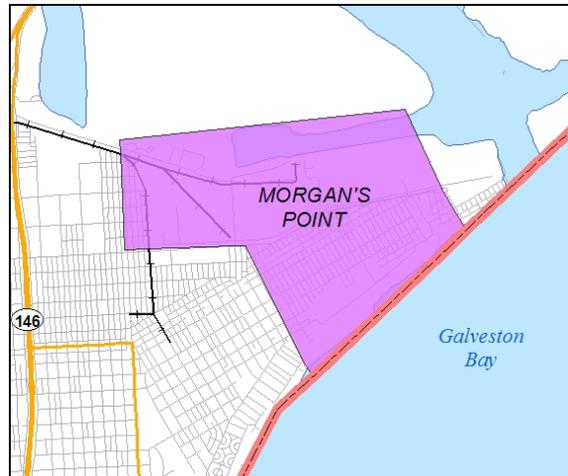
7.3.17.2 Non-Housing - Infrastructure

There were no reported damages to City of Missouri City Infrastructure located in Harris County at the time this report was published.



7.3.18 City of Morgan's Point

The City of Morgan's Point has an estimated population of 365 people. Approximately 51.7 percent of the population is classified as being in the labor force. The median household income is \$57,917 per year. A total of 2.2 percent of the residents of Morgan's Point are below the poverty level. The population breaks down into the following major race categories: white (88.7 percent), black or African American (4.5 percent), and Other (4.5 percent). There are a total of 59 occupied housing units in the city, with 17.1 percent being rented rather than owned.



7.2.18.1 Housing

Morgan's Point's has a total of 59 housing units, which include single family and multi-family, of which none were damaged enough to be categorized Level 4, destroyed, but two were categorized at Level 3, major damage and are uninhabitable. The projected, total residential damage amount for the City of Morgan's Point stands at \$403,218. In addition, data from the damage assessment projects the temporary housing need for those displaced in Morgan's Point at three households.

The Overall Damage Levels presented in the table listed below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Morgan's Point. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$12,891,079	58	40	16	1	1	0	\$371,277
Multi-Family	\$53,235	1	0	0	0	1	0	\$31,941
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$12,944,314	59	40	16	1	2	0	\$403,218

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-50
City of Morgan's Point Summary of Damage by Housing Unit Type

7.3.18.2 Non-Housing - Infrastructure

The City of Morgan's Point has a total of \$260,000 in damage or new projects. The only categories that have projects are water, and buildings. There was damage done to the city's water tower and also needed fence repair to the Morgan's Point Cemetery.

Itemized damage by category is shown in the table below:

City of Morgan's Point Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$6,000	\$0	\$6,000	\$6,000	\$0
Sewer	\$0	\$0	\$0	\$0	\$0
Drainage	\$0	\$0	\$0	\$0	\$0
Buildings	\$2,730	\$0	\$2,730	\$2,048	\$683
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$0	\$0	\$0	\$0
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$251,374	\$0	\$251,374	\$230,286	\$21,088
Parks, Recreational Facilities	\$0	\$0	\$0	\$0	\$0
Subtotal	\$260,104	\$0	\$260,104	\$238,334	\$21,770
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$260,104	\$0	\$260,104	\$238,334	\$21,770

Table 7-51
City of Morgan's Point Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

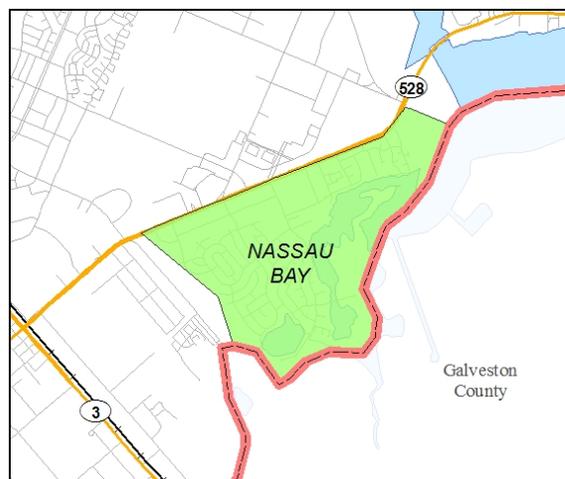
City of Morgan's Point Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$260,104	\$0	\$260,104	\$238,334	\$21,770
Flood	\$0	\$0	\$0	\$0	\$0
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$0	\$0	\$0	\$0	\$0
TOTAL	\$260,104	\$0	\$260,104	\$238,334	\$21,770

Table 7-52
City of Morgan's Point Cause of Damage Summary



7.3.19 City of Nassau Bay

The City of Nassau Bay has an estimated population of 4,466 people. Approximately 65.7 percent of the population is classified as being in the labor force. The median household income is \$57,353 per year. A total of 4.5 percent of the residents of Nassau Bay are below the poverty level. The population breaks down into the following major race categories: white (89.6 percent), black or African American (1.9 percent), and Asian (3.9 percent). There are a total of 1,457 occupied housing units in the city, with 39.8 percent being rented rather than owned.



7.3.19.1 Housing

Nassau Bay has a total of 1,457 housing units, which include single family and multi-family, of which 147 units were damaged enough to be categorized at Levels 4 and 3, or uninhabitable. The projected, total residential damage amount for the City of Nassau Bay stands at \$50,554,271. In addition, data from the damage assessment projects the temporary housing need for those displaced in Nassau Bay at 147 households.

The Overall Damage Levels presented in the table listed below are based on the Residential Damage Assessment and provide a snapshot of Hurricane Ike's impact on Nassau Bay. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$230,585,413	1,319	299	729	144	128	19	\$48,189,866
Multi-Family	\$31,339,174	138	87	50	1	0	0	\$2,364,405
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$261,924,587	1,457	386	779	145	128	19	\$50,554,271

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-53
City of Nassau Bay Summary of Damage by Housing Unit Type

7.3.19.2 Non-Housing - Infrastructure

The City of Nassau Bay has a total of \$2.4 million in damage or new projects in addition to \$7.9 million in hazard mitigation projects. The highest in damage and new project costs are in sewage, drainage, and water projects. The largest of these projects is a \$1 million total force main replacement at Surf Court. The majority of hazard mitigation projects are made up of buildings, water, and drainage. The largest mitigation project is \$4.5 million to improve public safety and emergency response at the Public Safety Center.



The City of Nassau Bay reported critical infrastructure needs of \$2.4 million. A sample of these are:

- ▼ Surf Court Force Main Replacement
- ▼ Swan Lagoon Water Well Repairs
- ▼ Silt Removal from Lake Nassau Detention Pond Facility
- ▼ Bal Harbor Lift Station Repairs

Itemized damage by category is shown in the table below:

City of Nassau Bay Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$326,000	\$1,125,800	\$1,451,800	\$216,750	\$1,235,050
Sewer	\$1,653,150	\$789,750	\$2,442,900	\$286,875	\$2,156,025
Drainage	\$397,100	\$1,472,455	\$1,869,555	\$51,750	\$1,817,805
Buildings	\$0	\$4,545,000	\$4,545,000	\$0	\$4,545,000
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$0	\$0	\$0	\$0
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$0	\$0	\$0	\$0	\$0
Subtotal	\$2,376,250	\$7,933,005	\$10,309,255	\$555,375	\$9,753,880
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$2,376,250	\$7,933,005	\$10,309,255	\$555,375	\$9,753,880

Table 7-54
City of Nassau Bay Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

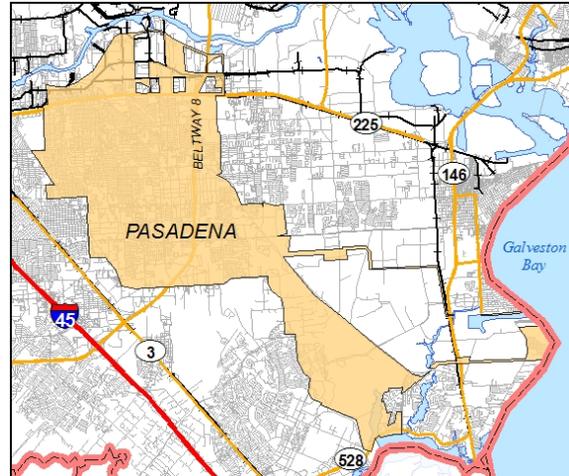
City of Nassau Bay Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$0	\$1,402,300	\$1,402,300	\$424,125	\$978,175
Flood	\$328,100	\$1,061,455	\$1,389,555	\$0	\$1,389,555
Surge	\$2,048,150	\$5,469,250	\$7,517,400	\$131,250	\$7,386,150
Other	\$0	\$0	\$0	\$0	\$0
TOTAL	\$2,376,250	\$7,933,005	\$10,309,255	\$555,375	\$9,753,880

Table 7-55
City of Nassau Bay Cause of Damage Summary



7.3.20 City of Pasadena

The City of Pasadena has an estimated population of 155,962 people. Approximately 67.1 percent of the population is classified as being in the labor force. The median household income is \$45,127 per year. A total of 17.2 percent of the residents of Pasadena are below the poverty level. The population breaks down into the following major race categories: white (66.2 percent), black or African American (1.7 percent), and Other (26.9 percent). There are a total of 32,668 occupied housing units in the city, with 42.8 percent being rented rather than owned.



7.3.20.1 Housing

Pasadena has a total of 32,668 housing units, which includes single family, multi-family and mobile home, of which 261 units were damaged enough to be categorized at Level 3 and 4, rendering them uninhabitable. The projected, total residential damage amount for the City of Pasadena stands at \$256 million. In addition, data from the damage assessment projects the temporary housing need for those displaced in Pasadena at 1,375 households.

The Overall Damage Levels presented in the table listed below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on Pasadena. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$2,948,184,310	32,023	15,851	14,627	1,294	242	9	\$206,587,267
Multi-Family	\$411,282,000	605	101	375	120	8	1	\$49,350,664
Mobile Homes	\$943,487	40	22	17	0	1	0	\$55,912
City Total	\$3,360,409,797	32,668	15,974	15,019	1,414	251	10	\$255,993,843

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-56
City of Pasadena Summary of Damage by Housing Unit Type

7.3.20.2 Non-Housing - Infrastructure

The City of Pasadena has a total of \$89.8 million in damage or new projects in addition to \$38.6 million in hazard mitigation projects. The highest in damage and new project costs are in buildings, utility infrastructure, water, and sewage projects. The largest utility infrastructure project is \$2.5 million to develop a master plan of the sanitary sewer system. The costliest project is \$60 million to rebuild the aging wastewater plant to help treat ammonia and nitrogen effectively. The majority of hazard mitigation projects are made up of buildings and drainage improvements. The mitigation projects include \$8 and \$10 million for drainage improvements and \$7 million for the rebuilding of the public works office building.



The City of Pasadena reported critical infrastructure needs of \$89.8 million. A sample of these are:

- ▼ Installation of Two New Water Wells
- ▼ Rehabilitation of Old Police Station Building
- ▼ Convention Center Building Repairs
- ▼ Lift Stations Repair
- ▼ Senior Citizen Center Building Repairs

Itemized damage by category is shown in the table below:

City of Pasadena Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$15,015,000	\$0	\$15,015,000	\$10,000	\$15,005,000
Sewer	\$66,600,000	\$0	\$66,600,000	\$14,000	\$66,586,000
Drainage	\$0	\$21,800,000	\$21,800,000	\$0	\$21,800,000
Buildings	\$5,200,000	\$7,000,000	\$12,200,000	\$2,585,000	\$9,615,000
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$850,000	\$850,000	\$0	\$850,000
Other Infrastructure	\$2,950,000	\$8,925,000	\$11,875,000	\$0	\$11,875,000
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$50,000	\$0	\$50,000	\$0	\$50,000
Subtotal	\$89,815,000	\$38,575,000	\$128,390,000	\$2,609,000	\$125,781,000
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$89,815,000	\$38,575,000	\$128,390,000	\$2,609,000	\$125,781,000

Table 7-57
City of Pasadena Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

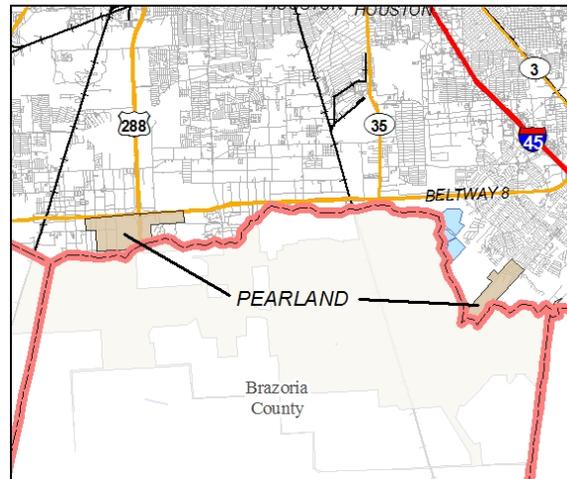
City of Pasadena Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$0	\$5,850,000	\$5,850,000	\$0	\$5,850,000
Flood	\$7,515,000	\$28,925,000	\$36,440,000	\$2,609,000	\$33,831,000
Surge	\$82,300,000	\$3,800,000	\$86,100,000	\$0	\$86,100,000
Other	\$0	\$0	\$0	\$0	\$0
TOTAL	\$89,815,000	\$38,575,000	\$128,390,000	\$2,609,000	\$125,781,000

Table 7-58
City of Pasadena Cause of Damage Summary



7.3.21 City of Pearland

The City of Pearland has an estimated population of 68,305 people, of which 8,410 reside in Harris County. Approximately 72.5 percent of the population is classified as being in the labor force. The median household income is \$64,156 per year. A total of 4.7 percent of the residents of Pearland are below the poverty level. The population breaks down into the following major race categories: white (82.6 percent), black or African American (5.3 percent), and Other (6.1 percent). There are a total of 1,476 occupied housing units that lie within Harris County, with 20.6 percent being rented rather than owned.



7.3.21.1 Housing

Pearland lies south of Houston and straddles the Harris-Brazoria County line. Of the 68,000+ residents, 8,410 reside in Harris County. The majority of Pearland falls within Brazoria County, with a small portion along the South Sam Houston Tollway, in Harris County. Despite its inland location, Pearland is still occasionally affected by Gulf Coast storms, which included Hurricane Ike.

Pearland has a total of 1,476 housing units, of which none suffered Level 4 damage, destroyed, or Level 3 damage, major damage. The projected, total residential damage amount for the Harris County portion of the City of Pearland stands at \$7.9 million.

The Overall Damage Levels presented in the table listed below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on Pearland. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$248,490,126	1,474	452	1,007	15	0	0	\$7,730,462
Multi-Family	\$4,288,941	1	0	1	0	0	0	\$171,558
Mobile Homes	\$163,196	1	1	0	0	0	0	\$0
City Total	\$252,942,263	1,476	453	1,008	15	0	0	\$7,902,020

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-59
City of Pearland Summary of Damage by Housing Unit Type

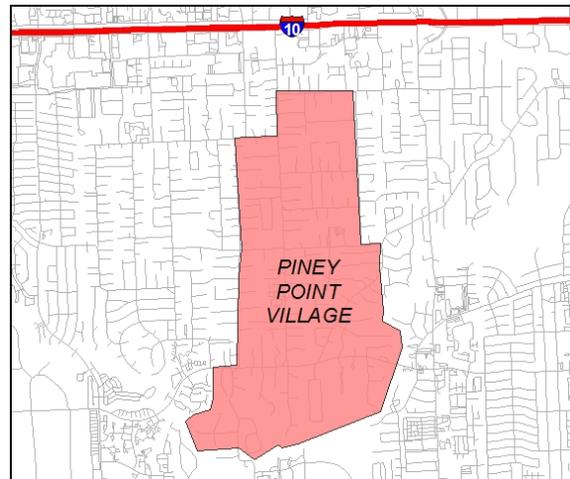
7.3.21.2 Non-Housing - Infrastructure

There were no reported damages to City of Pearland Infrastructure located in Harris County at the time this report was published.



7.3.22 City of Piney Point Village

The City of Piney Point Village has an estimated population of 3,500 people. Approximately 51.5 percent of the population is classified as being in the labor force. The median household income is \$184,991 per year. A total of 3.7 percent of the residents of Piney Point Village are below the poverty level. The population breaks down into the following major race categories: white (89.3 percent), black or African American (0.5 percent), and Asian (8.4 percent). There are a total of 1,141 occupied housing units in the city, with 4.4 percent being rented rather than owned.



7.3.22.1 Housing

Piney Point Village has a total of 1,141 housing units, of which six single family units were damaged enough to be categorized at Level 3, major damage. The projected total residential damage amount for the City of Piney Point Village stands at \$21 million. In addition, data from the damage assessment projects the temporary housing need for those displaced in Piney Point Village at six households.

The Overall Damage Levels presented in the table listed below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Piney Point Village. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$690,089,183	1,141	474	625	36	6	0	\$21,000,602
Multi-Family	\$0	0	0	0	0	0	0	\$0
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$690,089,183	1,141	474	625	36	6	0	\$21,000,602

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-60
City of Piney Point Village Summary of Damage by Housing Unit Type

The City of Piney Point Village also performed inspections which resulted in damage assessments. One of the city's damage assessment figures differed from Harris County. According to the city's assessment nine units should be categorized as Level 3 instead of six units per the county. These discrepancies may be caused by a difference in the methodology used by the city versus the county.

7.3.22.2 Non-Housing - Infrastructure

The City of Piney Point Village's only listed project is \$97,000 to remove debris from an open ditch drainage area.



Itemized damage by category is shown in the table below:

City of Piney Point Village Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$0	\$0	\$0	\$0	\$0
Sewer	\$0	\$0	\$0	\$0	\$0
Drainage	\$0	\$0	\$0	\$0	\$0
Buildings	\$0	\$0	\$0	\$0	\$0
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$0	\$0	\$0	\$0
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$97,250	\$0	\$97,250	\$50,738	\$46,512
Parks, Recreational Facilities	\$0	\$0	\$0	\$0	\$0
Subtotal	\$97,250	\$0	\$97,250	\$50,738	\$46,512
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$97,250	\$0	\$97,250	\$50,738	\$46,512

Table 7-61

City of Piney Point Village Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

City of Piney Point Village Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$97,250	\$0	\$97,250	\$50,738	\$46,512
Flood	\$0	\$0	\$0	\$0	\$0
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$0	\$0	\$0	\$0	\$0
TOTAL	\$97,250	\$0	\$97,250	\$50,738	\$46,512

Table 7-62

City of Piney Point Village Cause of Damage Summary



7.3.23 City of Seabrook

The City of Seabrook has an estimated population of 11,455 people. Approximately 75.9 percent of the population is classified as being in the labor force. The median household income is \$54,175 per year. A total of 5.5 percent of the residents of Seabrook are below the poverty level. The population breaks down into the following major race categories: white (88.9 percent), black or African American (2.1 percent), and Other (2.8 percent). There are a total of 3,696 occupied housing units in the city, with 48.1 percent being rented rather than owned.



7.3.23.1 Housing

Seabrook has a total of 3,696 housing units, which include single family, multi-family and mobile home units, of which 422 were damaged enough to be categorized as Level 3 and 4, uninhabitable. The projected, total residential damage amount for the City of Seabrook stands at \$111,838,399. In addition, data from the damage assessment projects the temporary housing need for the City of Seabrook at 445 households.

The Overall Damage Levels presented in the table below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Seabrook. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$557,294,608	3,321	885	1,434	609	315	78	\$84,535,249
Multi-Family	\$89,435,405	373	1	262	81	5	24	\$27,303,150
Mobile Homes	\$0	2	0	0	2	0	0	\$0
City Total	\$646,730,013	3,696	886	1,696	692	320	102	\$111,838,399

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-63
City of Seabrook Summary of Damage by Housing Unit Type

7.3.23.2 Non-Housing - Infrastructure

The City of Seabrook has a total of \$4.8 million in damage or new projects in addition to \$38.4 million in hazard mitigation projects. The highest in damage and new project costs are in transportation, water, and sewage. The largest transportation project is to spend \$3.1 million on street replacement at Seascape and Lakeside Drive. The majority of hazard mitigation projects are made up of sewage, buildings, and emergency generators. The major mitigation projects include \$25 million to make improvements to a wastewater treatment facility and \$6.8 million to relocate and elevate the police department and jail.



The City of Seabrook reported critical infrastructure needs of \$4.3 million. A sample of these are:

- ▼ Community House and Visitor Center
- ▼ Repair Baybrook and McHale Parks
- ▼ Repair Pine Gulley Park
- ▼ Water Supply Facility Repair

Itemized damage by category is shown in the table below:

City of Seabrook Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$216,648	\$0	\$216,648	\$162,486	\$54,162
Sewer	\$1,187,958	\$25,700,000	\$26,887,958	\$187,958	\$26,700,000
Drainage	\$0	\$0	\$0	\$0	\$0
Buildings	\$1,325,856	\$6,800,000	\$8,125,856	\$14,631	\$8,111,225
Equipment	\$0	\$200,000	\$200,000	\$0	\$200,000
Generators	\$230,000	\$2,201,000	\$2,431,000	\$0	\$2,431,000
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$1,375,282	\$0	\$1,375,282	\$1,375,282	\$0
Parks, Recreational Facilities	\$115,876	\$150,000	\$265,876	\$43,369	\$222,507
Subtotal	\$4,451,620	\$35,051,000	\$39,502,620	\$1,783,726	\$37,718,894
Navigation and Waterways	\$264,332	\$0	\$264,332	\$245,977	\$18,355
Transportation	\$116,316	\$3,345,000	\$3,461,316	\$0	\$3,461,316
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$4,832,268	\$38,396,000	\$43,228,268	\$2,029,703	\$41,198,565

Table 7-64
City of Seabrook Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

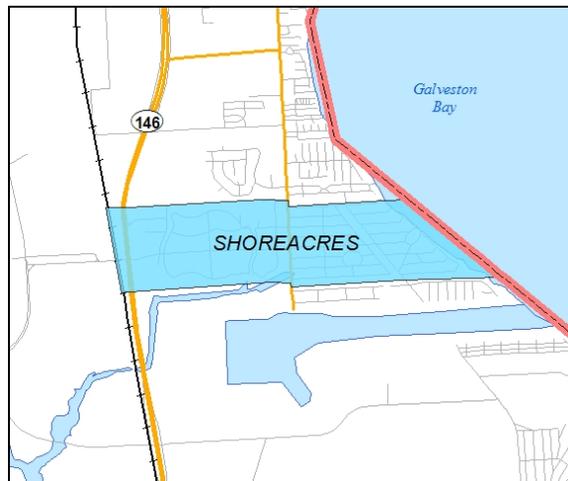
City of Seabrook Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$0	\$0	\$0	\$0	\$0
Flood	\$0	\$0	\$0	\$0	\$0
Surge	\$4,832,268	\$38,396,000	\$43,228,268	\$2,029,703	\$41,198,565
Other	\$0	\$0	\$0	\$0	\$0
TOTAL	\$4,832,268	\$38,396,000	\$43,228,268	\$2,029,703	\$41,198,565

Table 7-65
City of Seabrook Cause of Damage Summary



7.3.24 City of Shoreacres

The City of Shoreacres has an estimated population of 1,552 people. Approximately 66.7 percent of the population is classified as being in the labor force. The median household income is \$71,985 per year. A total of 1.8 percent of the residents of Shoreacres are below the poverty level. The population breaks down into the following major race categories: white (94.2 percent), black or African American (1.0 percent), and Other (3.0 percent). There are a total of 677 occupied housing units in the city, with 6.3 percent being rented rather than owned.



7.3.24.1 Housing

Shoreacres has a total of 677 single family housing units, of which 397 units were damaged enough to be categorized as Level 4 and 3, uninhabitable. The projected, total residential damage amount for the City of Shoreacres stands at \$33,243,508. In addition, data from the damage assessment projects the temporary housing need for the City of Seabrook at 397 households.

The Overall Damage Levels presented in the table listed below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Shoreacres. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$87,998,322	677	103	90	87	393	4	\$33,243,508
Multi-Family	\$0	0	0	0	0	0	0	\$0
Mobile Homes	\$0	2	0	0	2	0	0	\$0
City Total	\$87,998,322	677	103	90	87	393	4	\$33,243,508

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-66
City of Shoreacres Summary of Damage by Housing Unit Type

7.3.24.2 Non-Housing - Infrastructure

The City of Shoreacres has a total of \$500,000 in damage or new projects in addition to \$14.7 million in hazard mitigation projects. The highest in damage and new project costs are in parks and recreational facilities, buildings, and water. The largest park project is to replace the recreation pier on Miramar Drive. Water Treatment Plant #1 also suffered \$100,000 in damages. The majority of hazard mitigation projects are made up of water and other infrastructure. The largest mitigation project is \$10.1 million to replace city water mains, add fire hydrants, and include a SCADA system.



The City of Shoreacres reported critical infrastructure needs of \$500,000. A sample of these are:

- ▼ City Hall
- ▼ Public Works/Utility Storage Facility
- ▼ Wastewater Lift Stations No. 1, 2 and 3
- ▼ Heron and Circle Park

Itemized damage by category is shown in the table below:

City of Shoreacres Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$112,358	\$11,720,000	\$11,832,358	\$82,694	\$11,749,664
Sewer	\$32,500	\$275,000	\$307,500	\$21,357	\$286,143
Drainage	\$0	\$915,000	\$915,000	\$0	\$915,000
Buildings	\$107,728	\$240,000	\$347,728	\$67,867	\$279,861
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$0	\$0	\$0	\$0
Other Infrastructure	\$14,895	\$1,530,000	\$1,544,895	\$11,171	\$1,533,724
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$210,697	\$0	\$210,697	\$45,523	\$165,174
Subtotal	\$478,178	\$14,680,000	\$15,158,178	\$228,612	\$14,929,566
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$20,205	\$0	\$20,205	\$15,154	\$5,051
Total	\$498,383	\$14,680,000	\$15,178,383	\$243,766	\$14,934,617

Table 7-67
City of Shoreacres Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

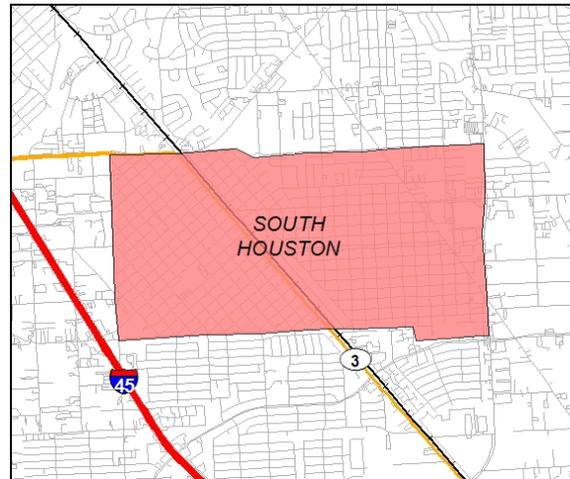
City of Shoreacres Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$25,677	\$10,265,000	\$10,290,677	\$19,258	\$10,271,419
Flood	\$271,620	\$3,025,000	\$3,296,620	\$186,193	\$3,110,427
Surge	\$201,086	\$1,390,000	\$1,591,086	\$38,315	\$1,552,771
Other	\$0	\$0	\$0	\$0	\$0
TOTAL	\$498,383	\$14,680,000	\$15,178,383	\$243,766	\$14,934,617

Table 7-68
City of Shoreacres Cause of Damage Summary



7.3.25 City of South Houston

The City of South Houston has an estimated population of 17,500 people. Approximately 57.7 percent of the population is classified as being in the labor force. The median household income is \$31,924 per year. A total of 20.9 percent of the residents of South Houston are below the poverty level. The population breaks down into the following major race categories: white (65.3 percent), black or African American (1.0 percent), and Other (27.7 percent). There are a total of 3,404 occupied housing units in the city, with 41.1 percent being rented rather than owned.



7.3.25.1 Housing

South Houston has a total of 3,404 housing units, which include single family, multi-family and mobile home, of which 18 units were damaged enough to be categorized Level 4 and 3, as uninhabitable. The projected, total residential damage amount for the City of South Houston stands at \$23,751,040. In addition, data from the damage assessment projects the temporary housing need for the City of South Houston, at 18 households.

The Overall Damage Levels presented in the table listed below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of South Houston. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$194,913,945	3,292	947	2,124	203	15	3	\$20,762,929
Multi-Family	\$19,098,243	84	11	69	4	0	0	\$2,985,844
Mobile Homes	\$34,403	28	7	17	4	0	0	\$2,267
City Total	\$214,046,591	3,404	965	2,210	211	15	3	\$23,751,040

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-69
City of South Houston Summary of Damage by Housing Unit Type

7.3.25.2 Non-Housing - Infrastructure

The City of South Houston has a total of \$22.4 million in damage or new projects in addition to \$41.2 million in hazard mitigation projects. The highest in damage and new project costs are in drainage and buildings. The biggest building project is \$4.5 million to build a new police station. The majority of hazard mitigation projects are made up of sewer infrastructure. The largest mitigation project is \$40 million to update all sewer lines from clay to modern pipes with larger capacity to reduce the amount of inflow and infiltration during storm events.



The City of South Houston reported critical infrastructure needs of \$22.4 million. A sample of these are:

- ▼ Mitigation Ponds on West Side of South Houston
- ▼ Water Tower Damage Repair
- ▼ Replace totaled ladder truck and related equipment
- ▼ Emergency alert/siren system

Itemized damage by category is shown in the table below:

City of South Houston Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$2,512,913	\$0	\$2,512,913	\$9,685	\$2,503,228
Sewer	\$2,052,165	\$40,000,000	\$42,052,165	\$39,124	\$42,013,041
Drainage	\$10,000,000	\$0	\$10,000,000	\$0	\$10,000,000
Buildings	\$6,152,500	\$350,000	\$6,502,500	\$1,875	\$6,500,625
Equipment	\$1,322,391	\$0	\$1,322,391	\$1,793	\$1,320,598
Generators	\$0	\$868,000	\$868,000	\$0	\$868,000
Other Infrastructure	\$78,363	\$0	\$78,363	\$58,773	\$19,591
Debris Removal	\$263,573	\$0	\$263,573	\$263,573	\$0
Parks, Recreational Facilities	\$37,114	\$0	\$37,114	\$27,836	\$9,279
Subtotal	\$22,419,019	\$41,218,000	\$63,637,019	\$402,658	\$63,234,361
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$22,419,019	\$41,218,000	\$63,637,019	\$402,658	\$63,234,361

Table 7-70
City of South Houston Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

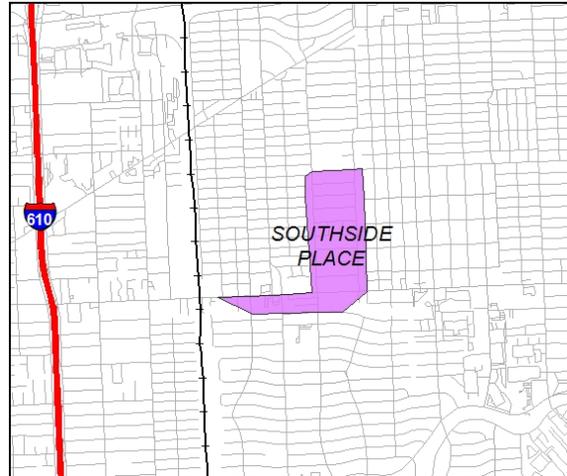
City of South Houston Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$3,215,930	\$350,000	\$3,565,930	\$11,948	\$3,553,982
Flood	\$18,170,000	\$40,780,000	\$58,950,000	\$0	\$58,950,000
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$1,033,089	\$88,000	\$1,121,089	\$390,710	\$730,379
TOTAL	\$22,419,019	\$41,218,000	\$63,637,019	\$402,658	\$63,234,361

Table 7-71
City of South Houston Cause of Damage Summary



7.3.26 City of Southside Place

The City of Southside Place has an estimated population of 1,629 people. Approximately 63.1 percent of the population is classified as being in the labor force. The median household income is \$81,267 per year. A total of 5.3 percent of the residents of Southside Place are below the poverty level. The population breaks down into the following major race categories: white (91.7 percent), black or African American (1.0 percent), and Asian (4.1 percent). There are a total of 425 occupied housing units in the city, with 39.6 percent being rented rather than owned.



7.3.26.1 Housing

Southside Place has a total of 425 housing units, which include single family and two multi-family units, of which one residential unit sustained enough damage to be categorized at Level 3, major damage. No residential units were designated as Level 4, destroyed, in Southside Place. The projected, total residential damage amount for the City of Southside Place stands at \$229,825. In addition, data from the damage assessment projects the temporary housing need for those displaced in Southside Place at one household.

The Overall Damage Levels presented in the table below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Southside Place. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$175,339,148	423	415	6	1	1	0	\$229,825
Multi-Family	\$442,720	2	2	0	0	0	0	\$0
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$175,781,868	425	417	6	1	1	0	\$229,825

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-72
City of Southside Place Summary of Damage by Housing Unit Type

7.3.26.2 Non-Housing - Infrastructure

The City of Southside Place has a total of \$4.4 million in hazard mitigation projects. The highest in damage and new project costs are in drainage and sewage. The most expensive hazard mitigation project is \$3 million to make drainage improvements along Harper Street. There are also requests for emergency generators at several locations including the water plant, the wastewater treatment plant, a sewage lift station, and the City Hall Emergency Management Office.



Itemized damage by category is shown in the table below:

City of Southside Place Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$0	\$0	\$0	\$0	\$0
Sewer	\$0	\$650,000	\$650,000	\$0	\$650,000
Drainage	\$0	\$3,000,000	\$3,000,000	\$0	\$3,000,000
Buildings	\$0	\$0	\$0	\$0	\$0
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$768,400	\$768,400	\$0	\$768,400
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$0	\$0	\$0	\$0	\$0
Subtotal	\$0	\$4,418,400	\$4,418,400	\$0	\$4,418,400
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$4,418,400	\$4,418,400	\$0	\$4,418,400

Table 7-73
City of Southside Place Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

City of Southside Place Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$0	\$1,093,400	\$1,093,400	\$0	\$1,093,400
Flood	\$0	\$3,325,000	\$3,325,000	\$0	\$3,325,000
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$0	\$0	\$0	\$0	\$0
TOTAL	\$0	\$4,418,400	\$4,418,400	\$0	\$4,418,400

Table 7-74
City of Southside Place Cause of Damage Summary



7.3.27 City of Spring Valley Village

The City of Spring Valley Village has an estimated population of 3,594 people. Approximately 62.4 percent of the population is classified as being in the labor force. The median household income is \$96,392 per year. A total of 2.7 percent of the residents of Spring Valley Village are below the poverty level. The population breaks down into the following major race categories: white (94.8 percent), black or African American (0.3 percent), and Asian (3.0 percent). There are a total of 1,390 occupied housing units in the city, with 5.5 percent being rented rather than owned.



7.3.27.1 Housing

Spring Valley Village has a total of 1,390 available housing units, which included single family and multi-family units, of which 30 units were damaged enough to be categorized (levels 3 and 4), as uninhabitable. The projected, total residential damage amount for the City of Spring Valley Village stands at over \$36 million. In addition, data from the damage assessment projects the temporary housing need for those displaced in Spring Valley Village at 30 households.

The Overall provide a snapshot of Hurricane Ike's impact on the City of Spring Valley Village. This information Damage Levels presented in the table listed below are based on the residential damage assessment and can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$259,648,486	1,389	346	741	272	29	1	\$36,934,720
Multi-Family	\$59,864	1	0	1	0	0	0	\$7,483
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$259,708,350	1,390	346	742	272	29	1	\$36,942,203

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-75
City of Spring Valley Village Summary of Damage by Housing Unit Type

7.3.27.1 Non-Housing - Infrastructure

The City of Spring Valley Village has a total of \$18,000 in damage or new projects in addition to \$820,000 in hazard mitigation projects. The highest in damage cost is to a gazebo at a local park. The majority of hazard mitigation projects are sewage infrastructure. The major mitigation project is to spend \$700,000 on sanitary sewer rehabilitation throughout the city.

Itemized damage by category is shown in the table below:

City of Spring Valley Village Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$0	\$0	\$0	\$0	\$0
Sewer	\$0	\$777,640	\$777,640	\$0	\$777,640
Drainage	\$0	\$0	\$0	\$0	\$0
Buildings	\$0	\$0	\$0	\$0	\$0
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$45,000	\$45,000	\$0	\$45,000
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$17,830	\$0	\$17,830	\$14,930	\$2,900
Subtotal	\$17,830	\$822,640	\$840,470	\$14,930	\$825,540
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$17,830	\$822,640	\$840,470	\$14,930	\$825,540

Table 7-76

City of Spring Valley Village Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

City of Spring Valley Village Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$17,830	\$0	\$17,830	\$14,930	\$2,900
Flood	\$0	\$75,000	\$75,000	\$0	\$75,000
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$0	\$747,640	\$747,640	\$0	\$747,640
TOTAL	\$17,830	\$822,640	\$840,470	\$14,930	\$825,540

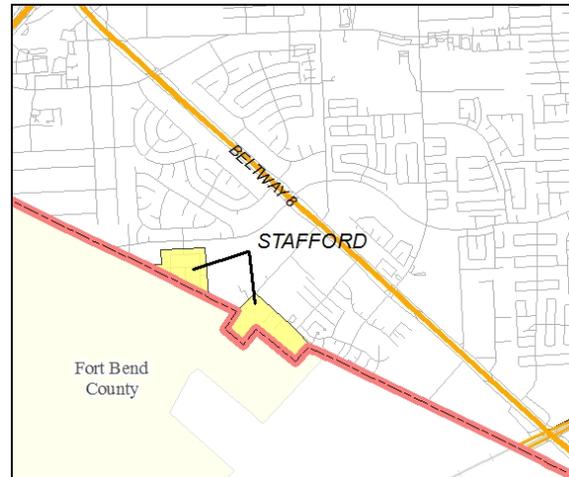
Table 7-77

City of Spring Valley Village Cause of Damage Summary



7.3.28 City of Stafford

The City of Stafford has an estimated population of 17,000 people, with only 350 residing in Harris County. Approximately 73.7 percent of the population is classified as being in the labor force. The median household income is \$50,323 per year. A total of 6.6 percent of the residents of Stafford are below the poverty level. The population breaks down into the following major race categories: white (46.9 percent), black or African American (18.9 percent), Asian (19.8 percent), and Other (10.5 percent). There are a total of 86 occupied housing units in the city, with 52.5 percent being rented rather than owned.



7.3.28.1 Housing

The City of Stafford, lies between Houston and Sugar Land along U.S. Highway 90A and Murphy Road, east of U.S. Highway 59. Of the 17,000+ residents, 350 reside in Harris County. Stafford straddles the Harris County and Fort Bend County lines, with the majority of the city within Fort Bend County. Stafford is bordered by Houston on the north, Missouri City on the east and Sugar Land on the west and south. Only two small sections of the city, containing about 350 people, fall within Harris County and these sections are the focus of this report.

Stafford has a total of 86 housing units within Harris County, which include single family units, of which no units were damaged enough to be categorized (Levels 3 and 4) as uninhabitable. There were 65 housing units damaged. The projected, total residential damage amount for the Harris County portion of the City of Stafford stands at \$705,983.

The Overall Damage Levels presented in the table listed below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Stafford. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$7,833,141	86	21	65	0	0	0	\$705,983
Multi-Family	\$0	0	0	0	0	0	0	\$0
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$7,833,141	86	21	65	0	0	0	\$705,983

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-78
City of Stafford Summary of Damage by Housing Unit Type



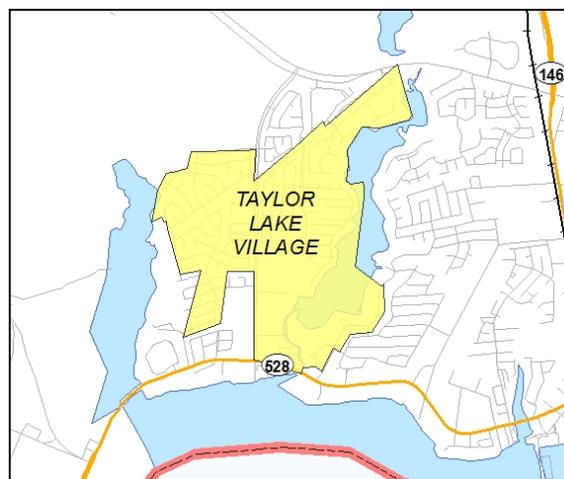
7.3.28.2 Non-Housing - Infrastructure

There were no reported damages to City of Stafford Infrastructure at the time this report was published.



7.3.29 City of Taylor Lake Village

The City of Taylor Lake Village has an estimated population of 3,695 people. Approximately 65.8 percent of the population is classified as being in the labor force. The median household income is \$99,535 per year. A total of 1.0 percent of the residents of Taylor Lake Village are below the poverty level. The population breaks down into the following major race categories: white (92.4 percent), black or African American (2.7 percent), and Other (1.0 percent). There are a total of 1,404 occupied housing units in the city, with 2.0 percent being rented rather than owned.



7.3.29.1 Housing

Taylor Lake Village has a total of 1,374 housing units, which are all single family, of which 38 residential units were damaged enough to be categorized (Levels 3 and 4) uninhabitable. The projected, total residential damage amount for the City of Taylor Lake Village stands at \$29 million. In addition, data from the damage assessment projects the temporary housing need for those displaced in Taylor Lake Village at 38 households.

The Overall Damage Levels presented in the table listed below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Taylor Lake Village. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$241,290,214	1,374	458	760	118	31	7	\$28,567,273
Multi-Family	\$0	0	0	0	0	0	0	\$0
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$241,290,214	1,374	458	760	118	31	7	\$28,567,273

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-79
City of Taylor Lake Village Summary of Damage by Housing Unit Type

The City of Taylor Lake Village also performed inspections which resulted in damage assessments. Some of the city's damage assessment figures differ from Harris County. The city's assessment indicated 754 level 1 and 13 level 4 single family units instead of the county's 760 and seven units respectively. These discrepancies may be caused by a difference in the methodology used by the city versus the county.

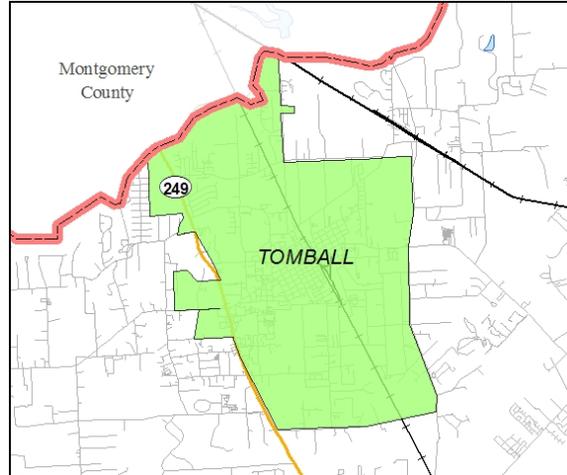
7.3.29.2 Non-Housing - Infrastructure

There were no reported damages to City of Taylor Lake Village Infrastructure at the time this report was published.



7.3.30 City of Tomball

The City of Tomball has an estimated population of 11,163 people. Approximately 66.9 percent of the population is classified as being in the labor force. The median household income is \$37,787 per year. A total of 7.3 percent of the residents of Tomball are below the poverty level. The population breaks down into the following major race categories: white (86.7 percent), black or African American (4.9 percent), and Other (5.6 percent). There are a total of 2,059 occupied housing units in the city, with 57.0 percent being rented rather than owned.



7.3.30.1 Housing

Tomball has a total of 2,059 available housing units, which include single family, multi-family and mobile home housing units, of which four were damaged enough to be categorized as Level 4, destroyed. There were no residential units that experienced Level 3, major damage. The projected total residential damage amount for the City of Tomball stands at \$20.2 million. In addition, data from the damage assessment projects the temporary housing need for those displaced in Tomball at four households.

The Overall Damage Levels presented in the table listed below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Tomball. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$248,854,003	2,011	810	1,170	27	0	4	\$13,213,798
Multi-Family	\$74,014,842	45	3	40	2	0	0	\$6,997,039
Mobile Homes	\$327,677	3	0	3	0	0	0	\$32,768
City Total	\$323,196,522	2,059	813	1,213	29	0	4	\$20,243,605

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-80
City of Tomball Summary of damage by Housing Unit Type

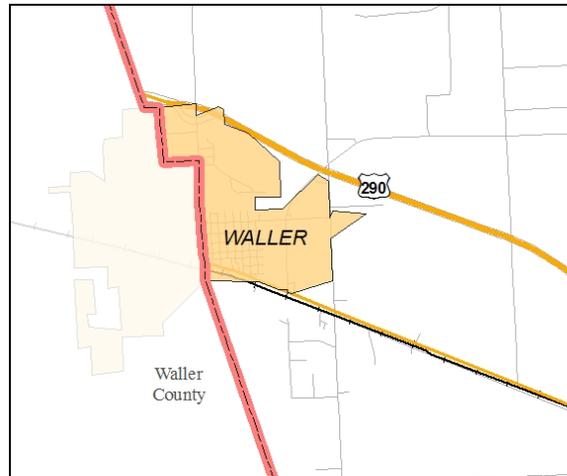
7.3.30.2 Non-Housing - Infrastructure

There were no reported damages to City of Tomball Infrastructure at the time this report was published.



7.3.31 City of Waller

The City of Waller has an estimated population of 1,500 people, with 612 of those residing in Harris County. Approximately 67.1 percent of the population is classified as being in the labor force. The median household income is \$33,162 per year. A total of 18.3 percent of the residents of Waller are below the poverty level. The population breaks down into the following major race categories: white (66.2 percent), black or African American (21.7 percent), and Other (9.9 percent). Waller has a total of 55 occupied housing units that lie within Harris County, with 45.3 percent being rented rather than owned.



7.3.31.2 Housing

Waller sits in far Northwest Harris County along U.S. 290 on the Harris County and Waller County lines. A little more than half of the city and most of the population rests in Waller County, with the remainder, including 612 people, within Harris County.

Waller has a total of 55 housing units within Harris County, which included single family, mobile homes and multi-family units, of which none were damaged enough to be categorized as Levels 3 or 4, uninhabitable. Nine were damaged in the affected and minor categories (Levels 1 and 2). The projected, total residential damage amount for the Harris County portion of the City of Waller stands at \$43,606.

The Overall Damage Levels presented in the table listed below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Waller. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$4,111,437	50	43	6	1	0	0	\$35,292
Multi-Family	\$319,379	2	2	0	0	0	0	\$0
Mobile Homes	\$207,847	3	1	2	0	0	0	\$8,314
City Total	\$4,638,663	55	46	8	1	0	0	\$43,606

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

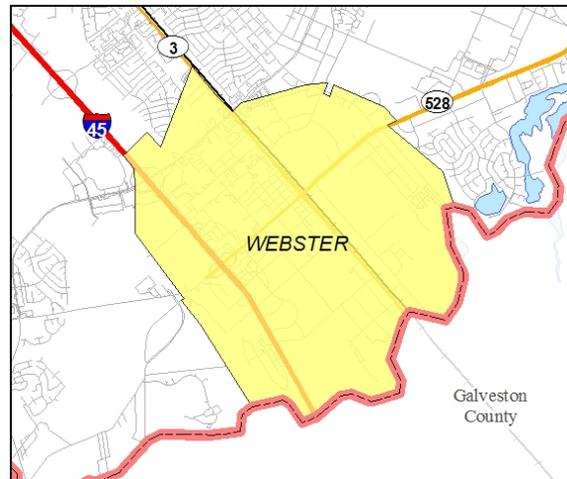
Table 7-81
City of Waller Summary of damage by Housing Unit Type

7.3.31.2 Non-Housing - Infrastructure

There were no reported damages to City of Waller Infrastructure at the time this report was published.

7.3.32 City of Webster

The City of Webster has an estimated population of 11,189 people. Approximately 77.6 percent of the population is classified as being in the labor force. The median household income is \$42,385 per year. A total of 13.2 percent of the residents of Webster are below the poverty level. The population breaks down into the following major race categories: white (64.8 percent), black or African American (9.0 percent), and Other (15.8 percent). There are a total of 1,170 occupied housing units in the city, with 86.4 percent being rented rather than owned.



7.3.32.1 Housing

Webster has a total of 1,170 housing units, which include single family and multi-family units, of which four units were damaged enough to be categorized Level 3, uninhabitable. No residential units were categorized as Level 4, destroyed. The majority of Webster's recorded housing units, 766, were classified as Level 1, affected damage. The projected total residential damage amount for the City of Webster stands at \$33.6 million. In addition, data from the damage assessment projects the temporary housing need for those displaced in Webster at 465 households.

The Overall Damage Levels presented in the table listed below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of Webster. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$56,277,135	527	146	322	57	2	0	\$3,891,448
Multi-Family	\$187,390,653	643	187	444	10	2	0	\$29,737,411
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$243,667,788	1,170	333	766	67	4	0	\$33,628,859

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-82
City of Webster Summary of damage by Housing Unit Type

7.3.32.2 Non-Housing - Infrastructure

The City of Webster has a total of \$6.2 million in damage or new projects in addition to \$250,000 in hazard mitigation projects. The highest of damage or new project cost is in buildings. The biggest building project is to replace the Central Fire Station for \$6 million. The majority of hazard mitigation projects are made up of emergency generators for lift stations.



The City of Webster reported critical infrastructure needs of \$6.2 million. A sample of these are:

- ▼ Lift Station No. 2, 3 and 5
- ▼ Texas Avenue Park
- ▼ Control Room Building Roof
- ▼ City Hall Lights

Itemized damage by category is shown in the table below:

City of Webster Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$1,740	\$0	\$1,740	\$1,305	\$435
Sewer	\$107,896	\$0	\$107,896	\$80,922	\$26,974
Drainage	\$0	\$0	\$0	\$0	\$0
Buildings	\$6,032,555	\$25,000	\$6,057,555	\$24,416	\$6,033,139
Equipment	\$6,425	\$0	\$6,425	\$4,818	\$1,607
Generators	\$0	\$225,000	\$225,000	\$0	\$225,000
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$24,922	\$0	\$24,922	\$18,692	\$6,230
Subtotal	\$6,173,538	\$250,000	\$6,423,538	\$130,153	\$6,293,385
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$13,708	\$0	\$13,708	\$10,281	\$3,427
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$6,187,246	\$250,000	\$6,437,246	\$140,434	\$6,296,812

Table 7-83
City of Webster Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

City of Webster Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$80,850	\$0	\$80,850	\$60,637	\$20,213
Flood	\$0	\$0	\$0	\$0	\$0
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$6,106,396	\$250,000	\$6,356,396	\$79,797	\$6,276,599
TOTAL	\$6,187,246	\$250,000	\$6,437,246	\$140,434	\$6,296,812

Table 7-84



7.3.33 City of West University Place

The City of West University Place has an estimated population of 14,828 people. Approximately 70.6 percent of the population is classified as being in the labor force. The median household income is \$130,721 per year. A total of 1.7 percent of the residents of West University Place are below the poverty level. The population breaks down into the following major race categories: white (60.3 percent), black or African American (17.6 percent), and Other (19.4 percent). There are a total of 5,444 occupied housing units in the city, with 9.4 percent being rented rather than owned.



7.3.33.1 Housing

West University Place has a total of 5,444 housing units, which included single family and multi-family units, of which four residential units were damaged enough to be categorized (Levels 3 and 4) as uninhabitable. The projected total residential damage amount for the City of West University Place stands at \$2.4 million. In addition, data from the damage assessment projects the temporary housing need for those displaced in West University Place at four households.

The Overall Damage Levels presented in the table listed below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the City of West University Place. This information can be used to determine the resulting housing needs and aid in the community's recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$1,632,568,531	5,414	5,144	250	16	3	1	\$2,389,411
Multi-Family	\$5,227,762	30	30	0	0	0	0	\$0
Mobile Homes	\$0	0	0	0	0	0	0	\$0
City Total	\$1,637,796,293	5,444	5,174	250	16	3	1	\$2,389,411

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-85
City of West University Place Summary of Damage by Housing Unit Type

7.3.33.2 Non-Housing - Infrastructure

The City of West University Place has a total of \$2.0 million in hazard mitigation projects. The mitigation projects requests are all for emergency generators at various locations, including the wastewater treatment plant, Wakeforest Water Plant, and other public works buildings.

Itemized damage by category is shown in the table below:

City of West University Place Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$0	\$401,000	\$401,000	\$0	\$401,000
Sewer	\$0	\$0	\$0	\$0	\$0
Drainage	\$0	\$0	\$0	\$0	\$0
Buildings	\$0	\$0	\$0	\$0	\$0
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$1,547,500	\$1,547,500	\$0	\$1,547,500
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$0	\$0	\$0	\$0	\$0
Subtotal	\$0	\$1,948,500	\$1,948,500	\$0	\$1,948,500
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$1,948,500	\$1,948,500	\$0	\$1,948,500

Table 7-86
City of West University Place Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

City of West University Place Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$0	\$1,948,500	\$1,948,500	\$0	\$1,948,500
Flood	\$0	\$0	\$0	\$0	\$0
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$0	\$0	\$0	\$0	\$0
TOTAL	\$0	\$1,948,500	\$1,948,500	\$0	\$1,948,500

Table 7-87
City of West University Place Cause of Damage Summary



7.4 Unincorporated Harris County

7.4.1 Housing

Approximately 41.3 percent of Harris County's residential units are located within unincorporated areas. A projected 163,282 or 39.8 percent of the 405,406 residential units incurred some level of damage. The damaged units include 160,712 single family, 281 mobile home and 2,289 multi-family, out of which 167 suffered Level 4 damage (destroyed), and 1,254 Level 3 damage (major), rendering them uninhabitable. Level 2, minor damage was incurred by 10,575 units, which may include missing shingles, broken windows and doors, and possibly 6 inches to 2 feet of water inside the dwelling. A projected 151,286 housing units had Level 1 damage, affected, which may include a few missing shingles, broken windows and less than 6 inches of water inside the unit. As a result of the 1,421 uninhabitable units a projected 3,304 households were displaced. The total projected damage value is \$2,372,883,040 with \$107,574,977 attributable to the uninhabitable units.

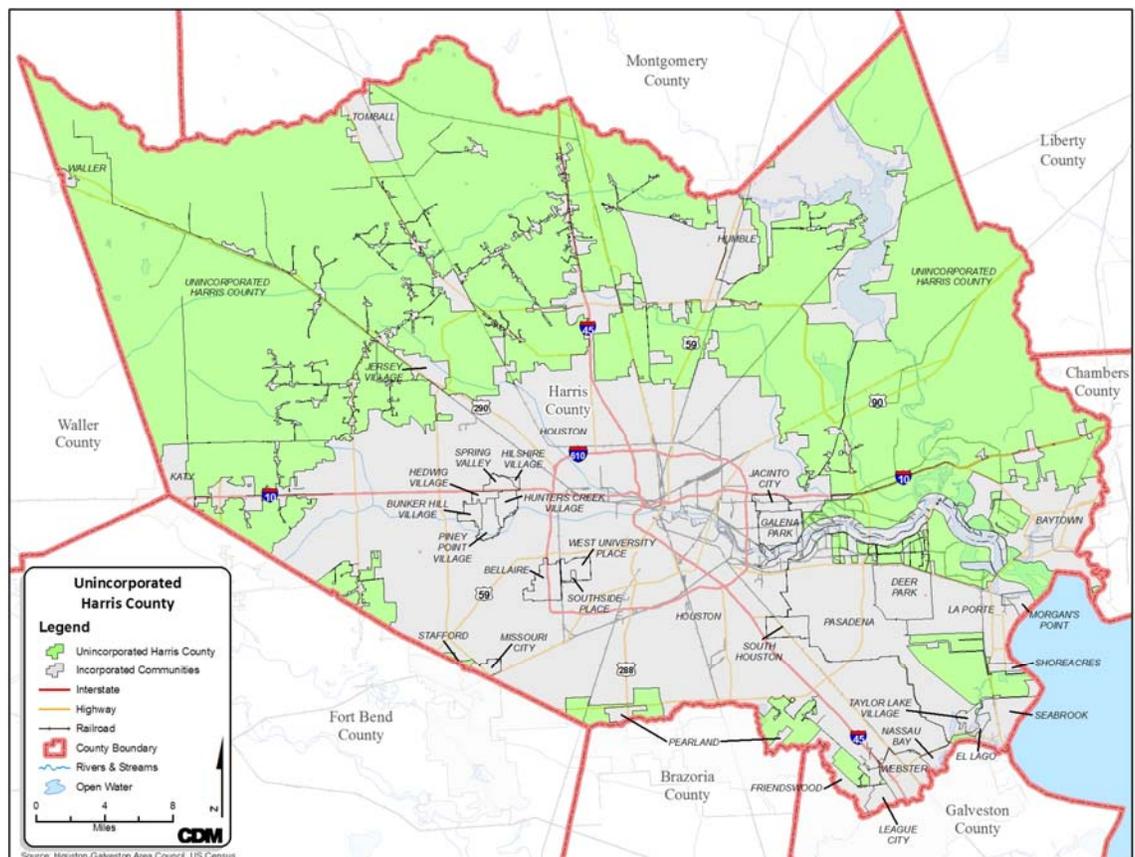


Figure 7-3
Unincorporated Harris County

The Overall Damage Levels presented in the table below are based on the residential damage assessment and provide a snapshot of Hurricane Ike's impact on the unincorporated areas of Harris County. This information can be used to determine the resulting housing needs and aid in the communities' recovery and redevelopment.

	Total Improved Value	Total Housing Units	Level 0	Level 1	Level 2	Level 3	Level 4	Total Damage Value
Single Family	\$48,752,038,370	405,406	244,694	149,928	10,384	1,235	165	\$2,029,607,173
Multi-Family	\$3,185,651,453	4,237	1,948	2,129	148	11	1	\$340,767,042
Mobile Homes	\$19,857,410	412	131	229	43	8	1	\$2,508,825
City Total	\$51,957,547,233	410,055	246,773	151,286	10,575	1,254	167	\$2,372,883,040

Source: Calculations by Harris County Public Infrastructure Department (HCPID) based on Harris County Appraisal District (HCAD) data

Table 7-88
Unincorporated Harris County Summary of Damage by Housing Unit Type

7.4.2 Non-Housing - Infrastructure

Infrastructure and associated services for unincorporated areas of Harris County are provided by several local governmental agencies. Typically, the following services are provided by these entities:

- ▼ Critical Infrastructure (water, wastewater, drainage, some buildings, equipment, generators, and some parks and recreational facilities) – Water Districts
- ▼ Navigation and Waterways – Harris County, Port of Houston, Army Corps of Engineers and others
- ▼ Transportation – Harris County, State of Texas
- ▼ Utility Infrastructure – Private Utilities such as CenterPoint, Comcast, Verizon, etc...
- ▼ Educational Facilities – Various Independent School Districts or Community College Systems

Navigation and Waterways, Transportation, Utility Infrastructure and Educational Facilities all have their own specific category and typically provide services well beyond the jurisdiction of any single water districts. As such, for the purposes of this report, unincorporated infrastructure needs are calculated and summarized assuming only critical infrastructure items typically provided by various water districts including municipal utility districts (MUD), water control & improvement districts (WC&ID), or special utility districts (SUD).

While several facilities incurred some storm related damage, a large majority of the projects include emergency standby generators for water delivery and wastewater conveyance and treatment systems. These systems are vital to maintain good public health, safety and welfare during times of extended power loss as experienced with Hurricane Ike.



Itemized damage by category is shown in the table below:

Unincorporated Harris County Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$31,981	\$0	\$31,981	\$0	\$31,981
Sewer	\$42,819	\$0	\$42,819	\$0	\$42,819
Drainage	\$1,760	\$0	\$1,760	\$0	\$1,760
Buildings	\$0	\$0	\$0	\$0	\$0
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$140,384,693	\$140,384,693	\$0	\$140,384,693
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$250	\$0	\$250	\$0	\$250
Parks, Recreational Facilities	\$0	\$0	\$0	\$0	\$0
Subtotal	\$76,809	\$140,384,693	\$140,461,502	\$0	\$140,461,502
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$76,809	\$140,384,693	\$140,461,502	\$0	\$140,461,502

Table 7-89
Unincorporated Harris County Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

Unincorporated Harris County Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$76,809	\$0	\$76,809	\$0	\$76,809
Flood	\$0	\$650,000	\$650,000	\$0	\$650,000
Surge	\$0	\$1,547,080	\$1,547,080	\$0	\$1,547,080
Other	\$0	\$138,187,613	\$138,187,613	\$0	\$138,187,613
TOTAL	\$76,809	\$140,384,693	\$140,461,502	\$0	\$140,461,502

Table 7-90
Unincorporated Harris County Cause of Damage Summary



7.5 Authorities

There are several entities within Harris County that are considered “special law” authorities. These entities own and operate infrastructure necessary to provide these services such as regional water or sewer service or navigation and waterway services. Because these authorities provide services across many local jurisdictional boundaries (serves several water districts, multiple Harris County precincts, across several incorporated cities, etc...), they are considered their own category. **Figure 7-4** shows the authorities included in this report.

There is one special project known as Patriots on the Lake. It does not fall under the jurisdiction of any of the previously mentioned entities so it is mentioned separately in this section. This facility would serve as a Veterans Administration hospital and is considered a new project.

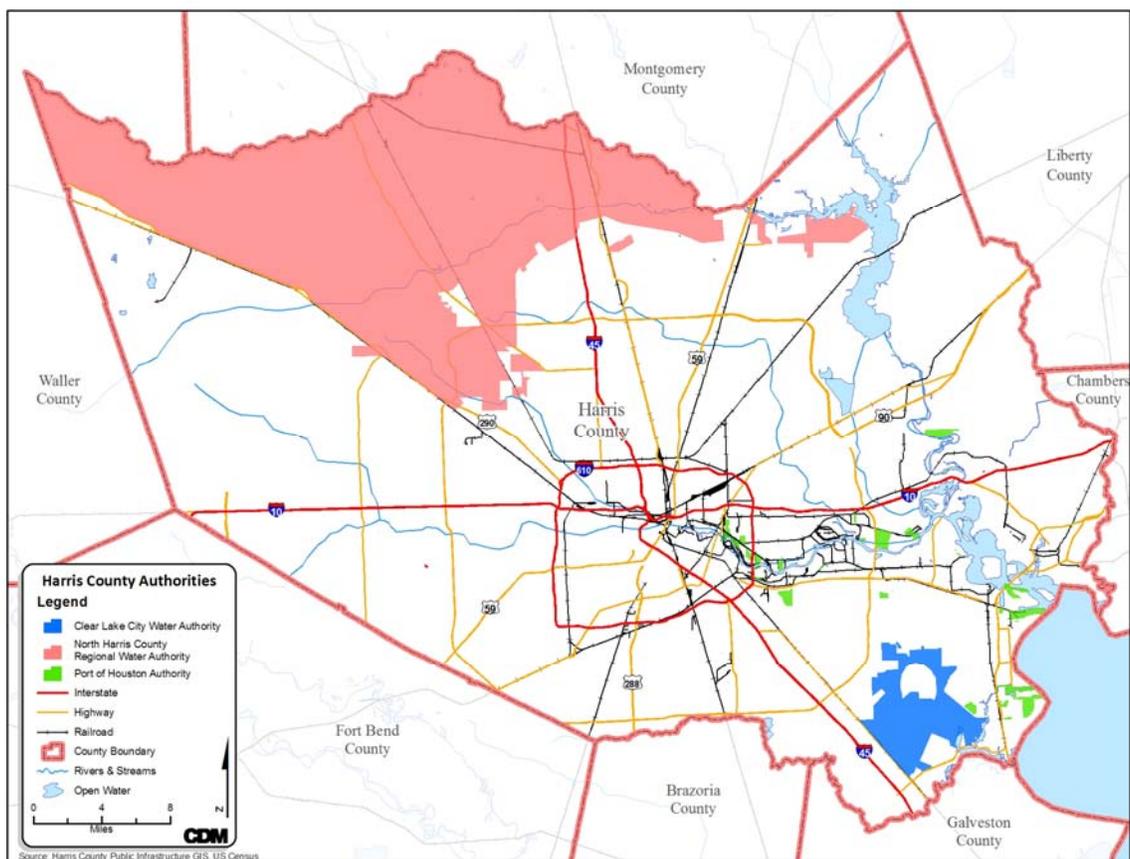


Figure 7-4
Harris County Authorities

7.5.1 Clear Lake City Water Authority

The Authority was created in 1963 to provide, operate, and maintain waterworks systems, sanitary sewer systems, storm sewer systems, and drainage facilities to serve land within its boundaries. The Authority is situated almost entirely in southeast Harris County in the Clear Lake area, about 20 miles southeast of downtown Houston. Its northwest to southeast boundary is State Highway 3. The Authority surrounds the Johnson Space Center on three sides. Ellington Field is located just outside the Authority's northwest boundary. At the time of its creation, the Authority consisted of 12,269 acres. Through various annexations, the current total land area is approximately 16,098 acres. Approximately 13,490 acres have been developed for commercial, residential, and public recreational use.

The Authority has \$1.75 million in hazard mitigation projects. The entire sum comes from 2 emergency generators for the wastewater treatment plant.

Itemized damage by category is shown in the table below:

Clear Lake City Water Authority Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$0	\$0	\$0	\$0	\$0
Sewer	\$0	\$0	\$0	\$0	\$0
Drainage	\$0	\$0	\$0	\$0	\$0
Buildings	\$0	\$0	\$0	\$0	\$0
Equipment	\$0	\$0	\$0	\$0	\$0
Generators	\$0	\$1,750,000	\$1,750,000	\$0	\$1,750,000
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$0	\$0	\$0	\$0	\$0
Subtotal	\$0	\$1,750,000	\$1,750,000	\$0	\$1,750,000
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$1,750,000	\$1,750,000	\$0	\$1,750,000

Table 7-91
Clear Lake City Water Authority Infrastructure Damage Summary



The breakdown by damage type is shown in the table below:

Clear Lake City Water Authority Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$0	\$0	\$0	\$0	\$0
Flood	\$0	\$0	\$0	\$0	\$0
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$0	\$1,750,000	\$1,750,000	\$0	\$1,750,000
TOTAL	\$0	\$1,750,000	\$1,750,000	\$0	\$1,750,000

Table 7-92

Clear Lake City Water Authority Cause of Damage Summary

7.5.2 North Harris County Regional Water Authority

The North Harris County Regional Water Authority (NHCRWA) was created in 1999 as the single entity empowered to negotiate for a secure, long-term, reliable, quality supply of wholesale drinking water for all the independent neighborhoods, municipal utility districts, small municipalities, and permitted well owners within its boundaries. These boundaries are essentially US 290 on the west, the Harris County line on the north (Spring Creek), FM 1960 and Bammel-North Houston on the south and the western shores of Lake Houston on the east. The Authority is comprised of 335 square miles and includes approximately 460,000 residents.

The NHCRWAs primary assignment is to develop and implement a strategy for complying with the Harris-Galveston Subsidence District's Regulatory Plan that requires a reduction in groundwater usage to no more than 20 percent of total water demand by the year 2030.

Since the Authority is not a taxing entity, funding for future water supply and the infrastructure through which to deliver it is being accomplished through the sale of revenue bonds, and paid for by groundwater pumpage fees.

The Authority has \$1.1 million in hazard mitigation projects. The most expensive projects are emergency generators. The largest project at \$1 million is a generator and backup fuel tank for the Spears Road Regional Pump Station.



Itemized damage by category is shown in the table below:

North Harris County Regional Water Authority Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$0	\$0	\$0	\$0	\$0
Sewer	\$0	\$0	\$0	\$0	\$0
Drainage	\$0	\$0	\$0	\$0	\$0
Buildings	\$0	\$0	\$0	\$0	\$0
Equipment	\$0	\$35,300	\$35,300	\$0	\$35,300
Generators	\$0	\$1,044,500	\$1,044,500	\$0	\$1,044,500
Other Infrastructure	\$0	\$0	\$0	\$0	\$0
Debris Removal	\$0	\$0	\$0	\$0	\$0
Parks, Recreational Facilities	\$0	\$0	\$0	\$0	\$0
Subtotal	\$0	\$1,079,800	\$1,079,800	\$0	\$1,079,800
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$0	\$0	\$0	\$0	\$0
Utility Infrastructure	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$1,079,800	\$1,079,800	\$0	\$1,079,800

Table 7-93
North Harris County Regional Water Authority Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

North Harris County Regional Water Authority Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$0	\$79,800	\$79,800	\$0	\$79,800
Flood	\$0	\$0	\$0	\$0	\$0
Surge	\$0	\$0	\$0	\$0	\$0
Other	\$0	\$1,000,000	\$1,000,000	\$0	\$1,000,000
TOTAL	\$0	\$1,079,800	\$1,079,800	\$0	\$1,079,800

Table 7-94
North Harris County Regional Water Authority Cause of Damage Summary

7.5.3 Port of Houston Authority

The Port of Houston (Port) is a 25-mile long complex that houses the Port of Houston Authority (PHA) and 150 plus private industries. Ranked No. 1 in the United States on foreign waterborne tonnage and No. 2 on total tonnage, the Port moves more than 7,500 vessels with over 200 million tons of cargo in a given year. The Port and the Ship Channel sustain approximately 800,000 jobs and create nearly \$118 billion of business for the State of Texas. In addition, the state and local tax revenue generated by business activities related to the Port surpass \$3.7 billion. The seriousness that the PHA takes on its business made them the first port to achieve the ISO14001 certification for environmental excellence and the first port in the world to receive the ISO 28000 certification for its security management system.



Ike's surge impacted several of the facilities of the PHA and eroded heavily the south and west shorelines of the Bayport Cruise Terminal, produced structural damage to the north side Turning Basin Transit Shed 11, destroyed the Fire Boat Dock at the Barbados Cut Terminal, and deposited a great amount of sediment on the waterway. The wind caused heavy damage to the Barbour's Cut Container Terminal, the Turning Basin Terminal, and the East Industrial Park Building 51, among others. In addition, it blew away several antennas, sensitive electronic equipment, and emergency communication equipment. The flood salt water inundated millions of dollars of electronic equipment and wiring, damaging computers, communication equipment, and controls.

The PHA was severely impacted by Hurricane Ike with estimated cost of repairs and replacement of sensitive equipment at over \$194 million. A detailed list of projects was provided to Harris County for review and is available upon the state's request. All of the electronic equipment that was flooded with salt water needs to be replaced, which generates a great toll on the PHA and is inhibiting them to provide the high level of service that is now standard to them. If the PHA fails to get all their facilities and equipment up and running, it may jeopardize their attractiveness to business use and port of preference and could negatively affect jobs and revenue for Texas.

The PHA also presented a proposal for projects that will allow them to minimize risk and exposure from upcoming storms and natural disasters and may help prevent this scale of damage in the future. This proposal involves 69 hazard mitigation projects that will protect several of their facilities and will cost \$172.0 million.

In total, the PHA requires \$454.6 million to continue operating at a peak level of efficiency. This amounts to less than 0.3 percent of the Port's contribution to the state's economy a year.

Itemized damage by category is shown in the table below:

Port of Houston Authority Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$80,000	\$0	\$80,000	\$0	\$80,000
Sewer	\$10,576,500	\$25,000	\$10,601,500	\$0	\$10,601,500
Drainage	\$18,145,000	\$28,263,735	\$46,408,735	\$0	\$46,408,735
Buildings	\$42,311,153	\$28,340,000	\$70,651,153	\$0	\$70,651,153
Equipment	\$609,252	\$0	\$609,252	\$0	\$609,252
Generators	\$14,284	\$50,000	\$64,284	\$0	\$64,284
Other Infrastructure	\$22,221,946	\$14,270,000	\$36,491,946	\$0	\$36,491,946
Debris Removal	\$11,000	\$0	\$11,000	\$0	\$11,000
Parks, Recreational Facilities	\$0	\$0	\$0	\$0	\$0

**Table 7-95
Port of Houston Authority Infrastructure Damage Summary**



Port of Houston Authority Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Subtotal	\$93,969,135	\$70,948,735	\$164,917,870	\$0	\$164,917,870
Navigation and Waterways	\$63,660,113	\$73,100,000	\$136,760,113	\$0	\$136,760,113
Transportation	\$99,869,750	\$22,561,400	\$122,431,150	\$0	\$122,431,150
Utility Infrastructure	\$25,090,151	\$5,377,000	\$30,467,151	\$0	\$30,467,151
Total	\$282,589,149	\$171,987,135	\$454,576,284	\$0	\$454,576,284

Table 7-95
Port of Houston Authority Infrastructure Damage Summary - Continued

The breakdown by damage type is shown in the table below:

Port of Houston Authority Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$27,506,787	\$1,030,000	\$28,536,787	\$0	\$28,536,787
Flood	\$340,148	\$0	\$340,148	\$0	\$340,148
Surge	\$27,442,680	\$3,300,000	\$30,742,680	\$0	\$30,742,680
Other	\$227,299,534	\$167,657,135	\$394,956,669	\$0	\$394,956,669
TOTAL	\$282,589,149	\$171,987,135	\$454,576,284	\$0	\$454,576,284

Table 7-96
Port of Houston Authority Cause of Damage Summary



7.6 Surge Zone/Flood Control

The following information outlines the Harris County Flood Control District's (HCFCD) most current data summarizing rainfall and storm surge flooding from Hurricane Ike. **Figure 7-5** shows the surge inundation caused by Hurricane Ike.

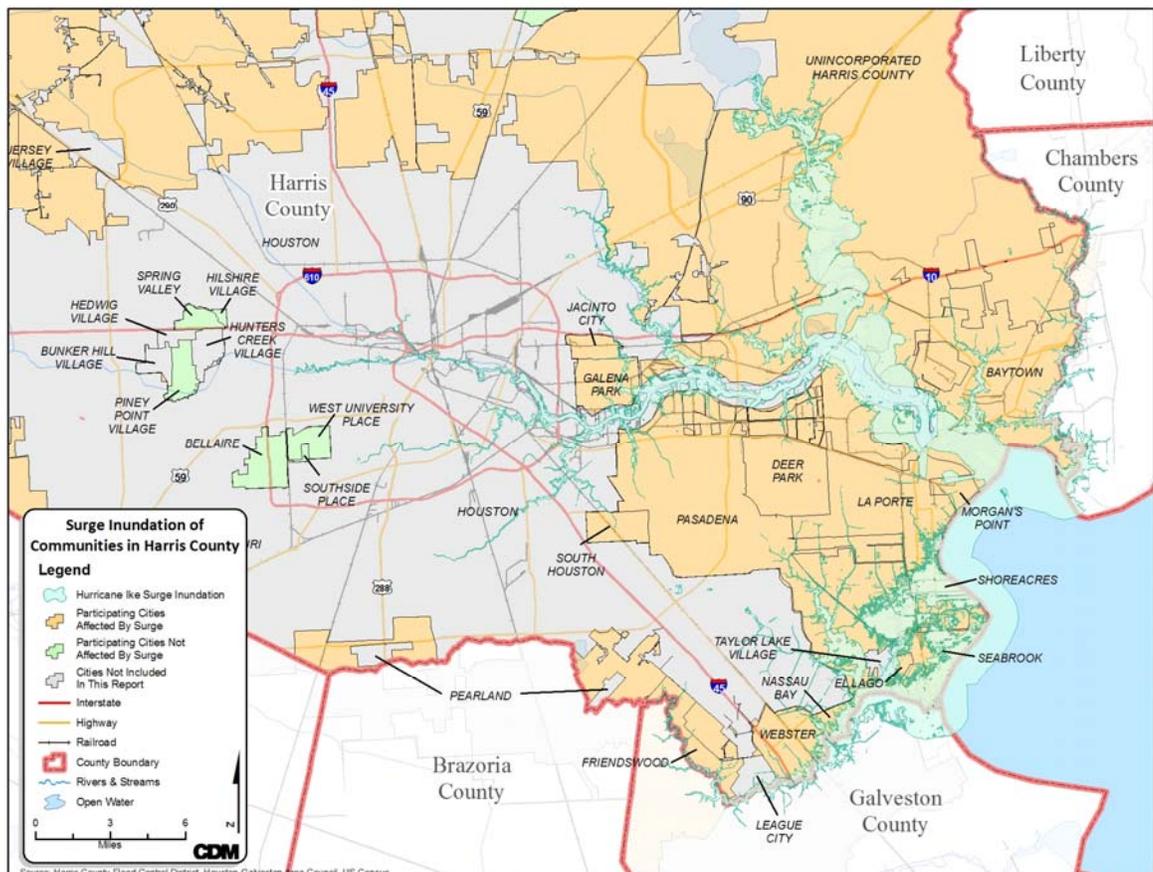


Figure 7-5
Surge Inundation of Communities in Harris County

7.6.1 General Flooding Statement

Hurricane Ike made landfall at Galveston Island, Texas at 2:10 a.m., on September 13, 2008, as a 100 mph Category 2 Hurricane and tracked north-northwest through Eastern Harris County, along and east of I-45. The hurricane produced a devastating storm surge and two separate flooding events across Harris County, along with sustained winds of 60-70 mph and wind gusts of 80-90 mph. The first flood event occurred during the actual landfall of the hurricane, as the western and southern eyewall moved across the county. Rainfall started around 9:00 p.m., on September 12th and continued into the early afternoon of the 13th. The second heavy rainfall and flood event occurred early on the 14th in Harris County, as the remains of tropical moisture interacted with an incoming outflow boundary from the northwest.

7.6.2 Storm Surge Overview

Hurricane Ike produced the highest storm surge along the upper Texas coast since 1915. On Galveston Island, only the Hurricane of 1915 and the great Hurricane of 1900 had higher storm surges than

Hurricane Ike. At Sabine Pass, Ike produced the highest storm surge on record at 14.24 feet, surpassing the deadly surge of Hurricane Audrey in 1957. Ike's surge was roughly 3 feet higher in Southwest Louisiana than Hurricane Rita's surge and extended along the Gulf Coast to the New Orleans area. The surge extended 15-18 miles inland, across Chambers County and inundated 80-90 percent of Galveston Island. Where the eastern eyewall crossed the coast along the Bolivar Peninsula, complete destruction of structures occurred from both the storm surge and large 10-12 foot Gulf wave action.

7.6.3 Storm Surge Harris County

Significant storm surge inundation occurred along the west side of Galveston Bay, flooding sections of Southeast Harris County along Galveston Bay, Clear Lake and the lower end of nearly all the watersheds, including the cities of Shoreacres, Clear Lake Shores, Seabrook, La Porte, Baytown, El Lago, Taylor Lake Village, and portions of Deer Park and Pasadena. Based on the elevations obtained from both the tide gages and ground surveys, Ike's storm surge averaged near, or above a 100-year surge event for the northwest part of Galveston Bay.

Overbank storm surge flooding occurred along the lower end of the following watersheds by late Friday afternoon, September 12th, well before the onset of the outer rain bands of the hurricane:

- ▼ San Jacinto River downstream of HWY 90
- ▼ Goose Creek downstream of HWY 146
- ▼ Cedar Bayou downstream of HWY 146
- ▼ Little Cedar Bayou downstream of HWY 146
- ▼ Vince Bayou downstream of SH 225
- ▼ Little Vince Bayou downstream of SH 225
- ▼ Clear Creek downstream of I-45
- ▼ Armand Bayou downstream of Genoa Red Bluff
- ▼ Hunting Bayou downstream of I-10
- ▼ Greens Bayou downstream of I-10
- ▼ Brays Bayou downstream of I-45
- ▼ Sims Bayou downstream of SH 225
- ▼ Buffalo Bayou downstream of Downtown Houston
- ▼ Carpenters Bayou downstream of Sheldon Road

HCFCF Teams surveyed 96 storm surge water marks in Harris County, 29 in Galveston County and three in Chambers County, to obtain a full overview of the extent and depth of the storm surge in the Galveston Bay complex. Additional surge marking efforts were done by various jurisdictions and their data was incorporated when it became available.

The values recorded show a storm surge of 10-12 feet along the southeast portion of Harris County, from Morgan's Point southward to Kemah. Values in Clear Lake and Clear Creek averaged 10-12 feet, up to I-45, including League City, Nassau Bay, Seabrook, Kemah, El Lago, and Clear Lake Shores. Values within Taylor Lake and the lower end of Taylor Bayou averaged 8.5-10.5 feet, or lower, than nearby elevations obtained on the north side of Clear Lake. It is suspected that the north-to-south alignment of this watershed and north-northeast surface winds, prevented the surge from fully inundating this part of the watershed. On the eastern portion of Taylor Bayou, from the Bayport Channel to west of SH 146, elevations ranged from 10.5-12.5 feet with vegetative debris facing toward the west, indicating the storm surge inundated from the Bay and not from Clear Lake.



In the eastern part of Harris County, storm surge elevations of 12-13 feet were common across the Baytown area and the east side of the lower San Jacinto River below I-10. Storm surge values were highest in the San Jacinto River and the Houston Ship Channel. Values averaged 13-15 feet in the San Jacinto River, below HWY 90 and the Houston Ship Channel from the San Jacinto River, westward to the turning basin. These elevations are consistent with hydrographs obtained from tide gages in these areas and Sea, Lake and Overland Surges from Hurricanes (SLOSH) modeling of the highest surge in the lower end of the watersheds of Northwest Galveston Bay.



7.7 Low Income Areas

Several of the areas that reported significant damage from Hurricane Ike have reported annual incomes within the low income level. These areas are shown on **Figure 7-6** below. For consistency, this report uses the US Department of Housing and Urban Development (HUD) definition of low income limit as at or below 80 percent of the median income for the area, adjusted for family size. Low income level areas are found in the following cities: Webster, South Houston, Galena Park, Jacinto City, and significant sections of unincorporated Harris County.

Itemized damage by category is shown in the table below:

Low Income Areas Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$17,571,153	\$26,645,000	\$44,216,153	\$20,990	\$44,195,163
Sewer	\$70,443,461	\$125,257,500	\$195,700,961	\$134,046	\$195,566,915
Drainage	\$10,201,764	\$44,985,000	\$55,186,764	\$0	\$55,186,764
Buildings	\$34,465,303	\$43,136,000	\$77,601,303	\$2,915,418	\$74,685,885
Equipment	\$5,506,816	\$2,675,000	\$8,181,816	\$6,611	\$8,175,205
Generators	\$0	\$65,499,420	\$65,499,420	\$0	\$65,499,420
Other Infrastructure	\$3,033,363	\$8,925,000	\$11,958,363	\$58,773	\$11,899,591
Debris Removal	\$263,573	\$0	\$263,573	\$263,573	\$0
Parks, Recreational Facilities	\$889,614	\$250,000	\$1,139,614	\$95,540	\$1,044,074
Subtotal	\$142,375,047	\$317,372,920	\$459,747,967	\$3,494,950	\$456,253,017
Navigation and Waterways	\$8,087,500	\$807,500	\$8,895,000	\$0	\$8,895,000
Transportation	\$408,708	\$41,160,000	\$41,568,708	\$10,281	\$41,558,427
Utility Infrastructure	\$0	\$7,000,000	\$7,000,000	\$0	\$7,000,000
Educational Facilities	\$58,015,837	\$12,898,233	\$70,914,070	\$22,253,704	\$48,660,367
Total	\$208,887,092	\$379,238,653	\$588,125,745	\$25,758,935	\$562,366,811

Table 7-97
Low Income Areas Infrastructure Damage Summary



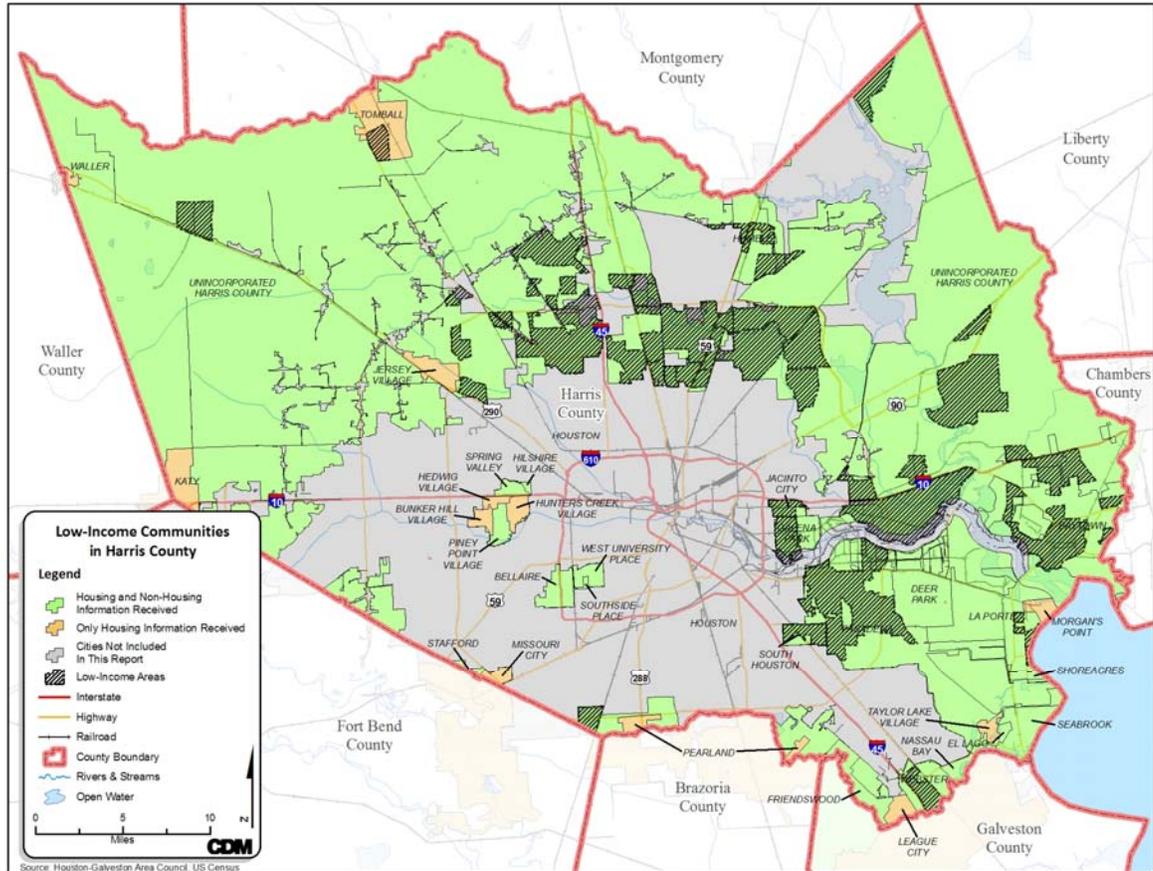


Figure 7-6
Low-Income Communities in Harris County

The breakdown by damage type is shown in the table below:

Low Income Areas Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$42,089,783	\$23,077,733	\$65,167,516	\$8,323,925	\$56,843,591
Flood	\$41,404,764	\$113,730,000	\$155,134,764	\$6,559,000	\$148,575,764
Surge	\$103,848,810	\$164,041,080	\$267,889,890	\$9,302	\$267,880,588
Other	\$21,543,736	\$78,389,840	\$99,933,576	\$10,866,708	\$89,066,868
TOTAL	\$208,887,092	\$379,238,653	\$588,125,745	\$25,758,935	\$562,366,811

Table 7-98
Low Income Areas Cause of Damage Summary

The following tables represent the projects that are located in either low or mixed income areas. Low income areas are shown on **Figure 7-6**. Projects that are in school districts or municipalities that are wholly or partially contained within a low income area are included on the low income table shown here. Mixed income projects were those that are potentially beneficial to the entire Harris County, but are not



necessarily isolated to one address or area. These include items such as upgrades to communication systems, large drainage projects, and repairs and improvements to some parks and community centers.

Mixed Income Areas Infrastructure Category	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Critical Infrastructure					
Water	\$10,926	\$250,000	\$260,926	\$1,070	\$259,857
Sewer	\$37,802	\$0	\$37,802	\$0	\$37,802
Drainage	\$0	\$330,620,000	\$330,620,000	\$0	\$330,620,000
Buildings	\$4,234,989	\$31,123,416	\$35,358,405	\$549,563	\$34,808,842
Equipment	\$40,268	\$282,300	\$322,568	\$19,732	\$302,835
Generators	\$62,389	\$174,105,000	\$174,167,389	\$56,248	\$174,111,142
Other Infrastructure	\$12,310,122	\$4,465,000	\$16,775,122	\$12,127,395	\$4,647,726
Debris Removal	\$30,642,358	\$0	\$30,642,358	\$30,641,627	\$731
Parks, Recreational Facilities	\$2,604,633	\$11,198,400	\$13,803,033	\$771,273	\$13,031,760
Subtotal	\$49,943,487	\$552,044,116	\$601,987,603	\$44,166,909	\$557,820,694
Navigation and Waterways	\$0	\$0	\$0	\$0	\$0
Transportation	\$3,390,625	\$206,000,000	\$209,390,625	\$87,127	\$209,303,498
Utility Infrastructure	\$130,000	\$4,500,000	\$4,630,000	\$0	\$4,630,000
Educational Facilities	\$0	\$0	\$0	\$0	\$0
Total	\$53,464,112	\$762,544,116	\$816,008,228	\$44,254,036	\$771,754,192

Table 7-99
Mixed Income Areas Infrastructure Damage Summary

The breakdown by damage type is shown in the table below:

Mixed Income Areas Cause of Damage	Repairs and New Projects	Hazard Mitigation	Total Needs	Expected FEMA and Other Funding	Unmet Needs
Wind	\$23,195,748	\$285,300	\$23,481,048	\$22,642,779	\$838,269
Flood	\$3,314,997	\$250,000	\$3,564,997	\$43,936	\$3,521,061
Surge	\$106,075	\$0	\$106,075	\$98,858	\$7,217
Other	\$26,847,293	\$762,008,816	\$788,856,109	\$21,468,464	\$767,387,645
TOTAL	\$53,464,112	\$762,544,116	\$816,008,228	\$44,254,036	\$771,754,192

Table 7-100
Mixed Income Areas Cause of Damage Summary



