

East Houston

Super Neighborhood 49



Briefing Book

Collaborative Community Design Initiative. No. 5

SPECIAL EDITION: HARVEY

Community Design Resource Center

2018



East Houston, Mesa and Fringewood
Photo by Juan Antonio Sorto

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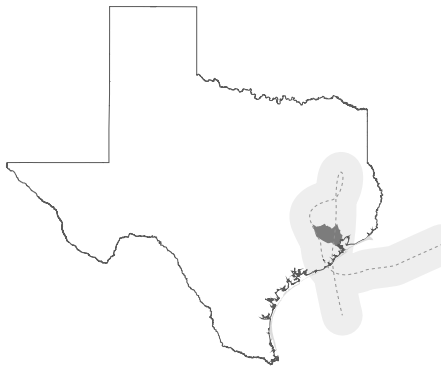
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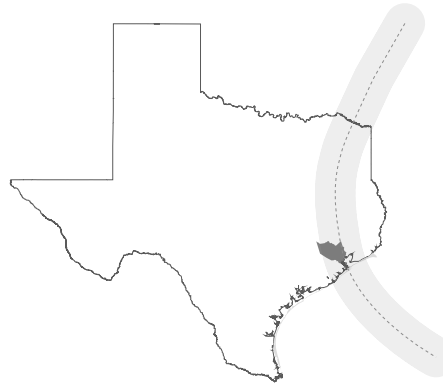
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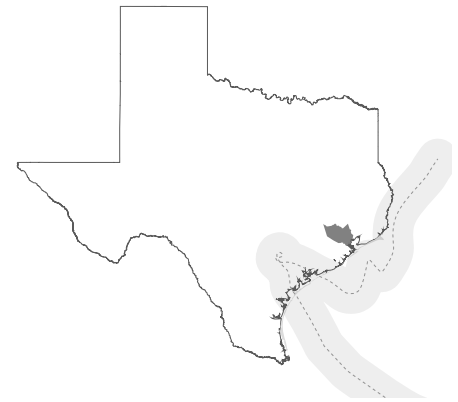
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Tropical Storm Allison Track, 2001



Hurricane Ike Track, 2008



Hurricane Harvey Track, 2017

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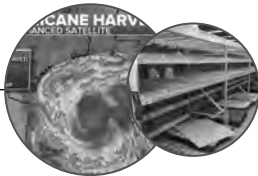
Houston suffered **two major flood events** in the years preceding Harvey, the Memorial Day Flood in 2015 and the Tax Day Flood in 2016.



A HISTORY OF FLOODING

AUG 24, 2017

On **Thursday Harvey** is upgraded from a tropical storm to a **hurricane. 30 inches of rain** is forecast in isolated instances. Supermarket shelves empty as residents make preparations.



HURRICANE HARVEY



AUG 25, 2017

On **Friday** Harvey is upgraded to a **Category 4 storm** and makes landfall at 10pm near Rockport. Several counties call for voluntary and mandatory **evacuations. Tornado and flood warnings** are issued. HISD closes schools.



AUG 26, 2017

On **Saturday** Harvey makes a second landfall and **weakens to a tropical storm**. Rain forecasts for Houston are measured in feet. Several cities implement **curfews and roads begin closing**. HISD cancels school for the next week.



AUG 27, 2017

Heavy rainfall begins Saturday night and by early Sunday morning neighborhoods begin **flooding and high water rescues** by boat and helicopter are being televised live.

ABOVE: Harvey Timeline
(Based on Analysis and Graphics by Matthew Nguyen, Constanza Peña, Victor Romo, and Cristina Trejo)

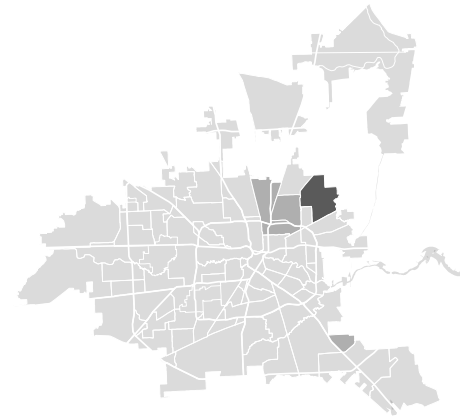
Introduction

At the time of this publication, it has been nearly a year since Hurricane Harvey made landfall and slowly circled around the greater Houston area for five days. Harvey left behind over 150,000 flooded homes and a maximum recorded rainfall of 47.4”.

It took only one month before the city seemed to be functioning normally. But the tragedy unfolding for thousands of families continues behind the closed doors of flooded homes and temporary hotel rooms. While natural disasters are equal opportunity events, the resources to recover are not. As civic leader Keith Downey notes: “The storm hit many underserved communities long before the hurricane arrived.”

The slow motion flood disaster that inundated Houston is evidence of a new climate normal. In the wake of this new normal we must begin to define and build towards greater resiliency—not just in preparation for the next disaster, but to ensure everyday resiliency.

The fifth biennial Collaborative Community Design Initiative, titled “Floods” is a partnership with four Houston neighborhoods that were severely impacted by Harvey: East Houston, Eastex/Jensen, Edgebrook, and Kashmere Gardens and Houston/Trinity Gardens. This Briefing Book is for the East Houston Super Neighborhood.



East Houston Location Map

AUG 28, 2017

In an unprecedented move, the **U.S. Army Corps of Engineers** begins **releasing water** from **reservoirs** in west Houston. The release is to avoid a collapse that would inundate downtown Houston. The release floods **thousands of homes** near the reservoirs.



AUG 29, 2017

The rain from Hurricane Harvey begins to taper off, and by late Tuesday most neighborhoods would not see any more rain. The highest recorded rainfall in Harris County is **47.4”**. An estimated **30,000** are in **Houston shelters**.

THE NEXT WEEK

Professionals, volunteers, and communities begin cleaning up. **Donation drives** and distribution points are set up across the city. Individuals are prompted to **contact insurance companies and apply for FEMA** assistance. Some begin returning to work.



THE AFTERMATH

THE MONTH AFTER
Mucking, demolitions, and citywide cleaning continues. **Some schools reopen**. Displaced families relocated to **temporary housing**. Insurance and FEMA agents begin **property inspections**.

SIX MONTHS LATER

Some reconstruction efforts begin. Nearly **894,000 FEMA applications** are filed by the November deadline. An estimated **150,000** structures flooded in Houston. Houston residents must now consider whether to **rebuild or permanently relocate**. Many still reside in **temporary, sometimes makeshift, homes**. FEMA hotel programs extended through June 2018.

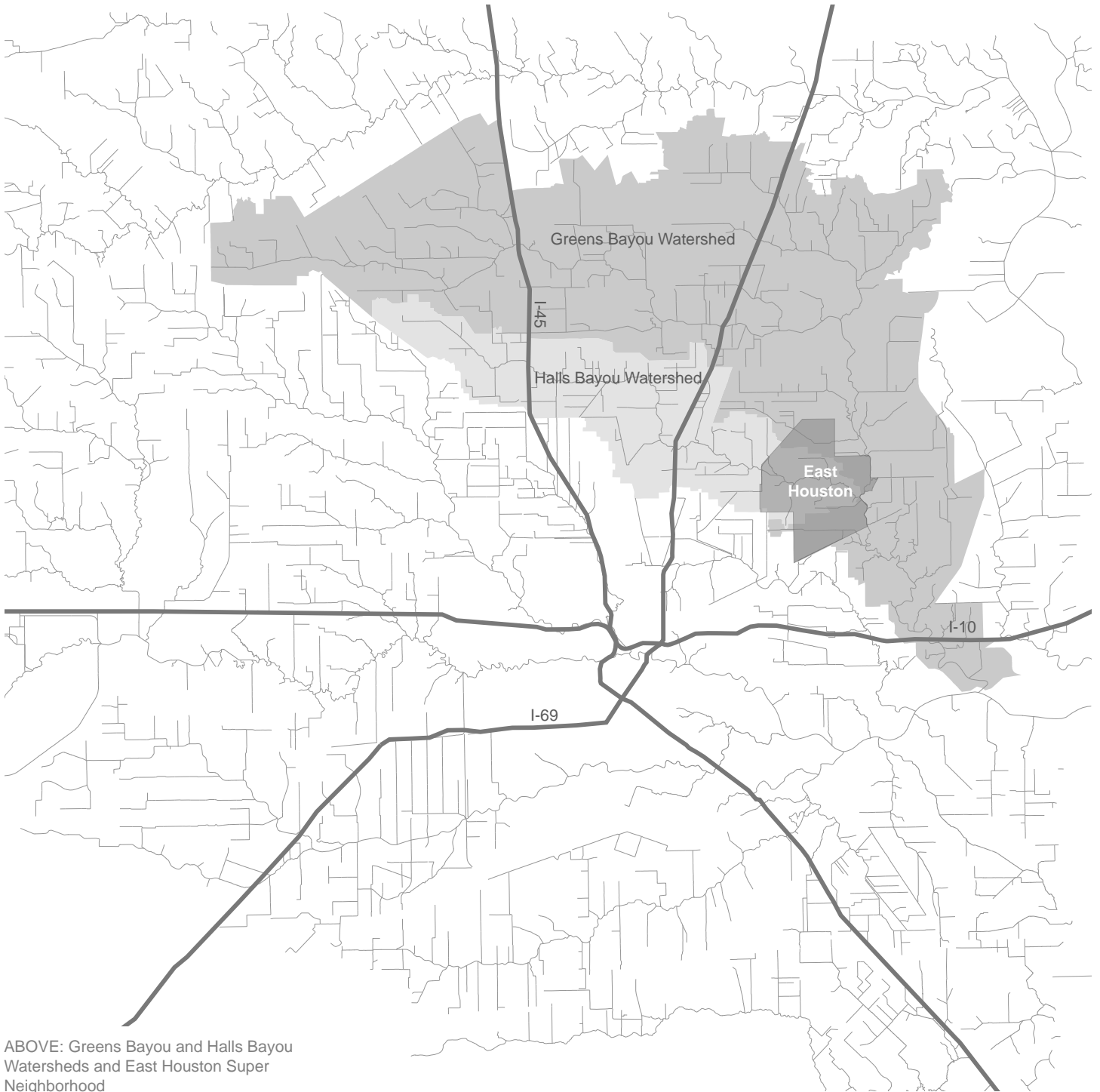


ONE YEAR LATER

Over **\$2 billion** in Recovery Funding is finally allocated to the City of Houston and Harris County for rebuilding. Codes and policies are being rewritten to mitigate flood risks. Efforts are lagging to ensure residents are more **informed and prepared** for future disasters.



THE FUTURE



ABOVE: Greens Bayou and Halls Bayou Watersheds and East Houston Super Neighborhood

East Houston

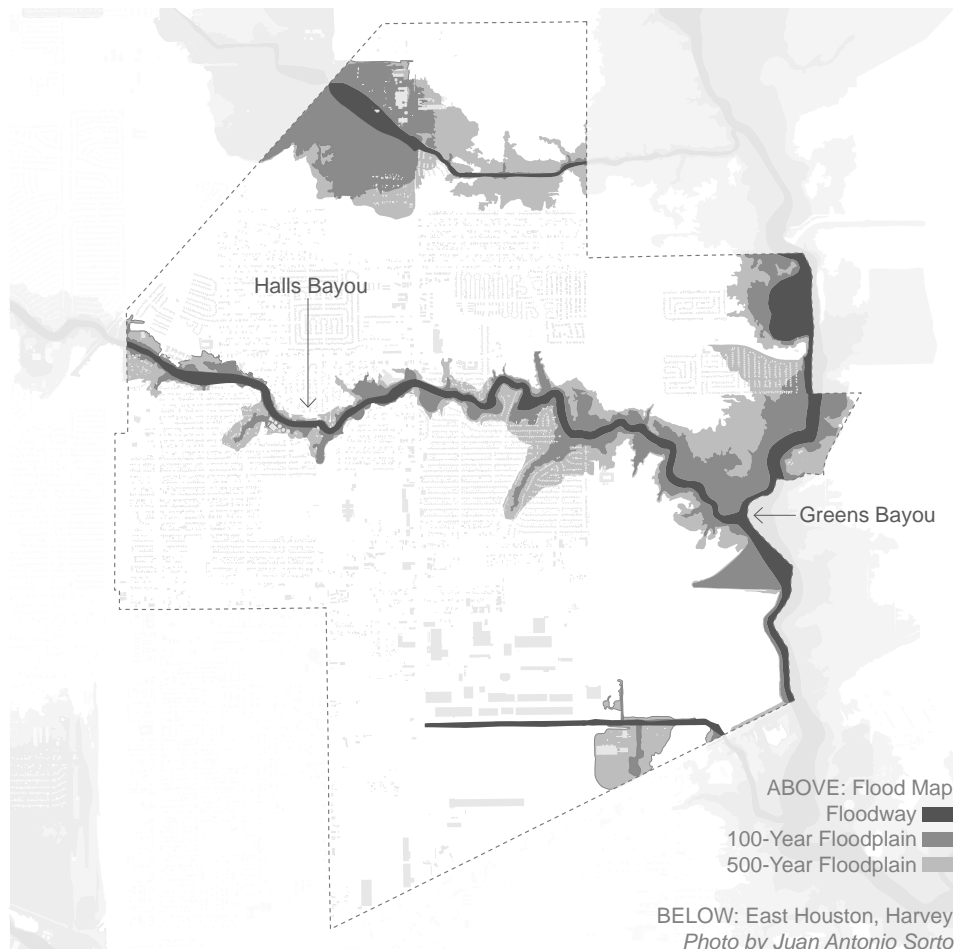
The East Houston Super Neighborhood is located in northeast Houston at the edge of the Houston city limits. The neighborhood is located in the Halls Bayou Watershed, which is part of the larger Greens Bayou Watershed.

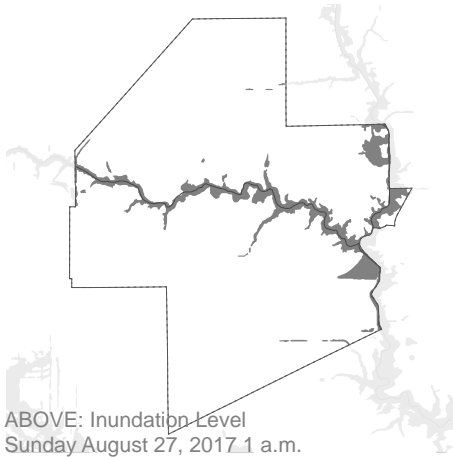
Halls Bayou meanders through the heart of the community, and connects to Greens Bayou on the east. Harris County Flood Control District is currently finalizing recommendations for improvements along Halls Bayou as part of the “Halls Ahead” project.

The Harris County Flood Control District data indicates that of the 154,170 homes flooded during Harvey 48,850 were within the 100-year floodplain and 34,970 within the 500-year floodplain. While 70,370 flooded homes were not in an identified floodplain hazard area.

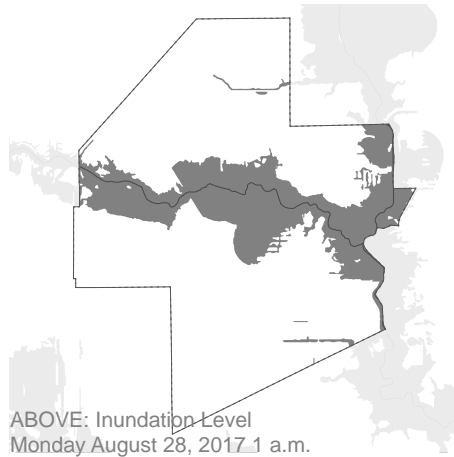
In East Houston the FEMA Flood Hazard maps indicate very little flooding risk, yet the area experienced significant flooding during Hurricane Harvey. In fact, flooding along Halls Bayou has been a persistent hazard for residents, businesses and property owners. Flooding has been documented at least 14 times since 1970. During Tropical Storm Allison in 2001, more than 13,000 homes in the Halls Bayou watershed flooded.

Harris County Flood Control District estimates that 36% of flooded homes across the county were covered by flood insurance policies, while 64% were not.

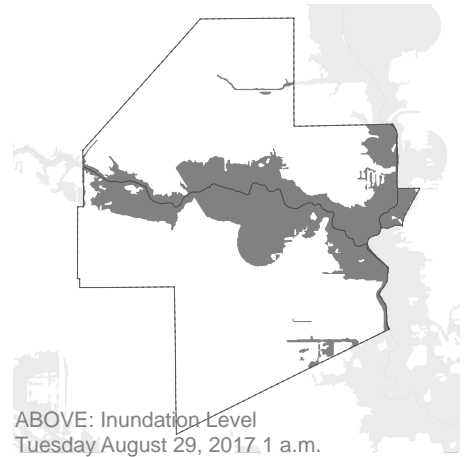




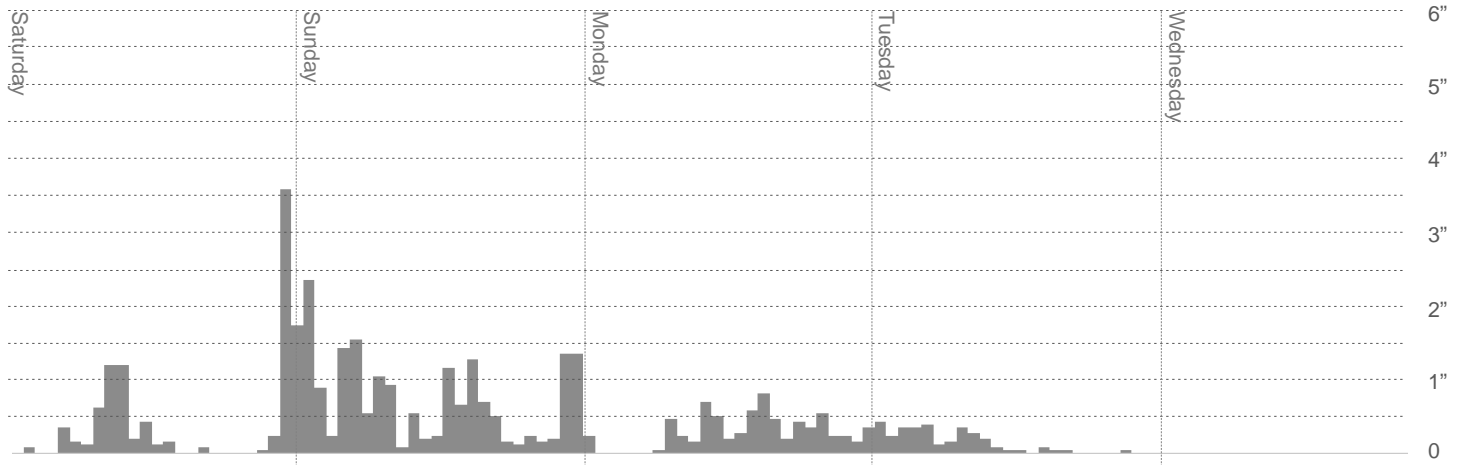
ABOVE: Inundation Level
Sunday August 27, 2017 1 a.m.



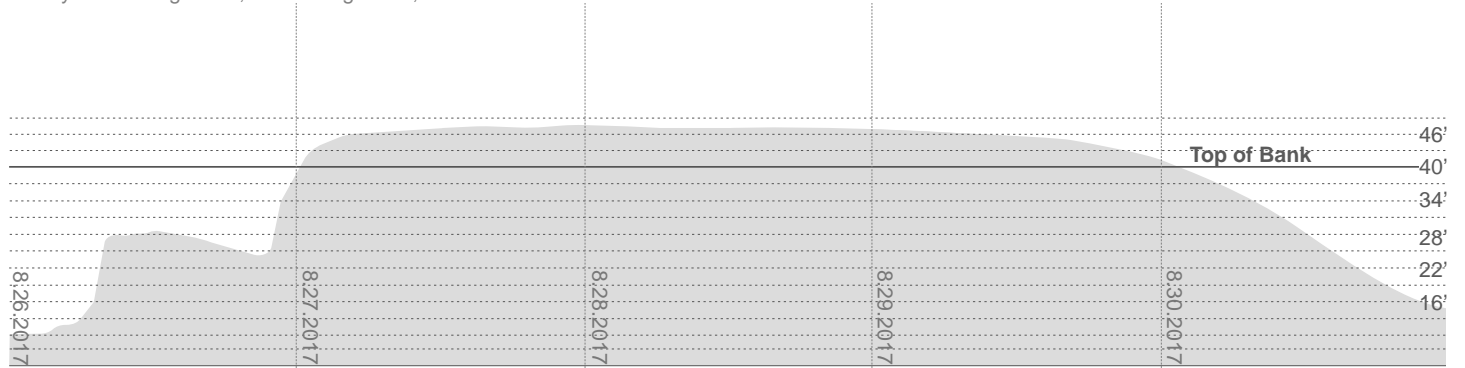
ABOVE: Inundation Level
Monday August 28, 2017 1 a.m.



ABOVE: Inundation Level
Tuesday August 29, 2017 1 a.m.



ABOVE: Hourly Rainfall Totals, Halls Bayou at Tidwell Road
Harvey Event: August 26, 2017 - August 20, 2017



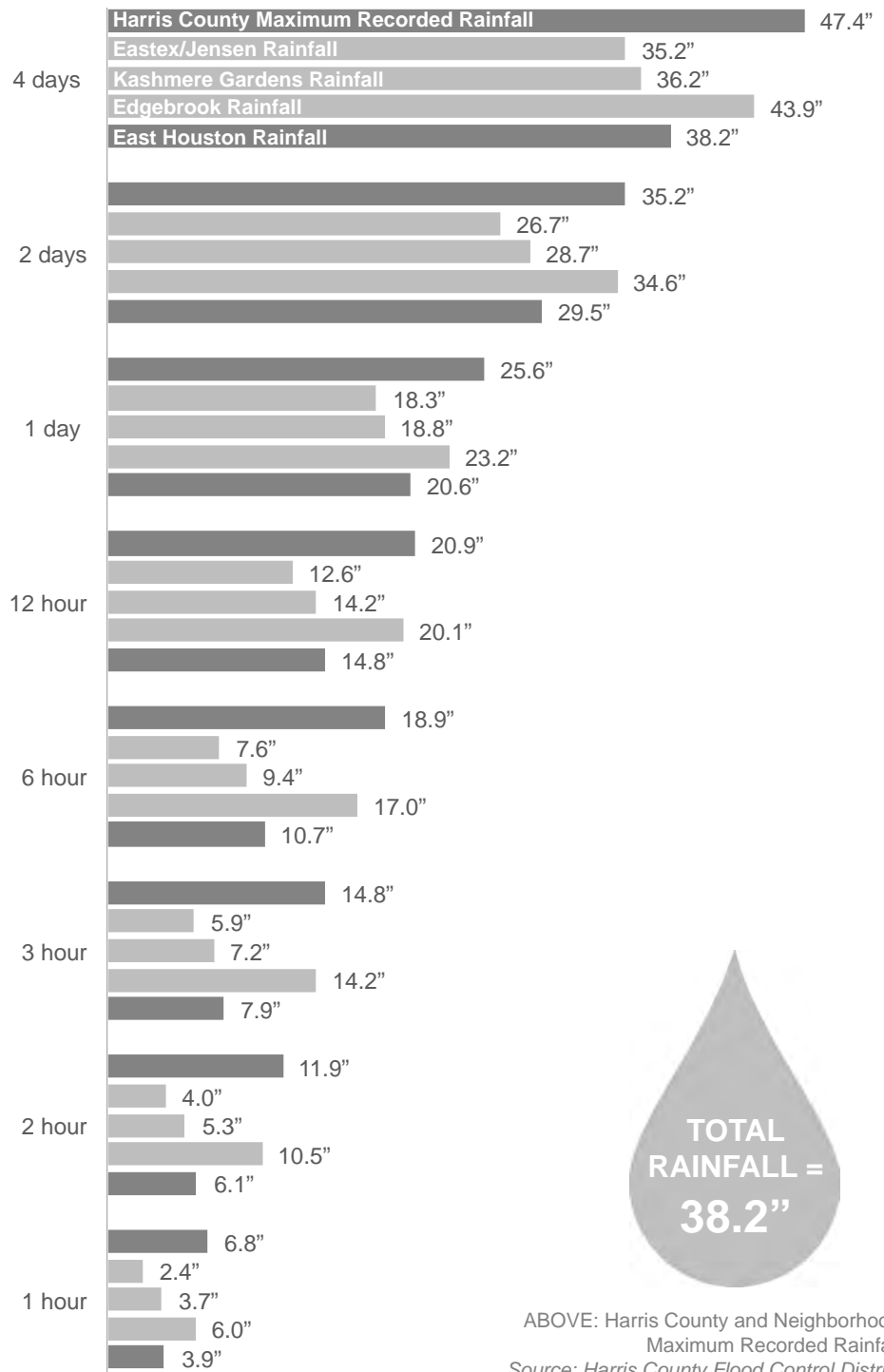
ABOVE: Stream Elevation, Halls Bayou at Tidwell Road
Harvey Event: August 26, 2017 - August 30, 2017
Source: Harris County Flood Warning System

The Harris County Flood Control District has compiled Hurricane Harvey rainfall data for gages across the county. The East Houston gage located at Tidwell Road and Halls Bayou was used to identify maximum rainfall in the East Houston Super Neighborhood. The total rainfall over the five-day event was 38.2". However, 20.6" of rain was recorded in a single 24-hour period during Harvey, one of the highest recorded rainfalls in a single day.

Halls Bayou topped its bank in the early morning hours of Sunday August 27, 2017 and remained over the top of bank until mid-day on Wednesday August 30, 2017. The maximum stream elevation peaked at 45.4', roughly 1' above the 500-year flood level of 44.4'.

According to data from the Harris County Flood Control District, 10,164 homes were flooded in the Halls Bayou Watershed, roughly 7% of the 154,700 estimated flooded homes county wide. FEMA estimates from September 2017 reported 2,281 of these homes were in the East Houston Super Neighborhood, or roughly 22% of all flooded homes in the Halls Bayou Watershed, even though the population of East Houston is 13% of the total watershed population.

Based on FEMA estimates 32% of all the homes in the East Houston Super Neighborhood flooded.



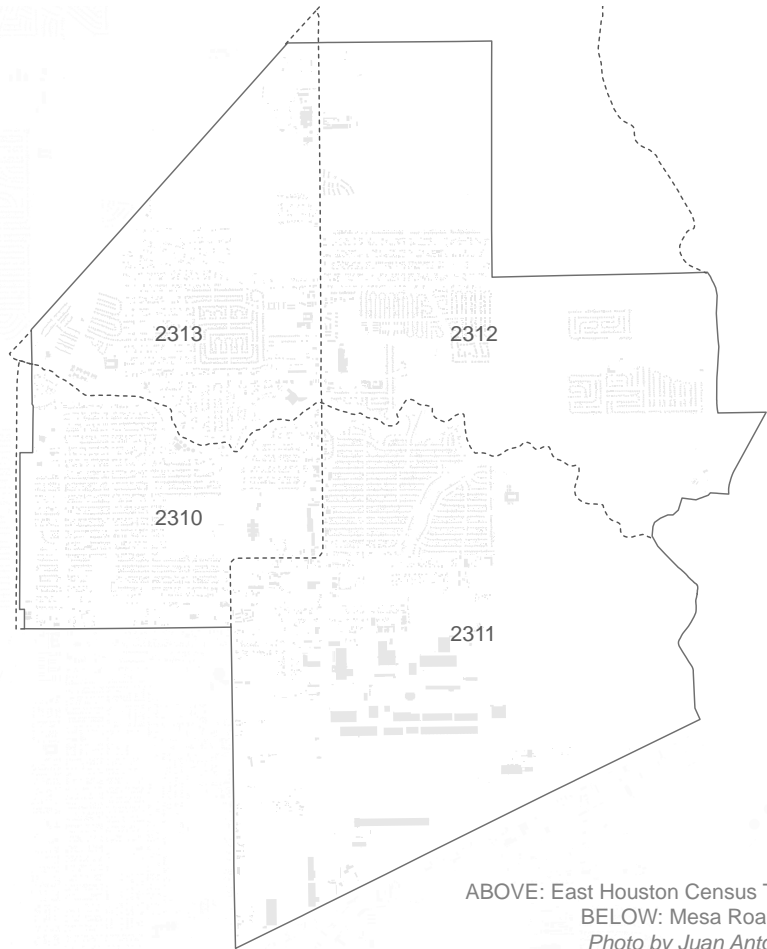
ABOVE: Harris County and Neighborhood Maximum Recorded Rainfall
Source: Harris County Flood Control District

	Tract 2310	Tract 2311	Tract 2312	Tract 2313	
Socioeconomic Vulnerability					
Persons below poverty	○	○	●	●	<i>Income and poverty impact a family's capacity to prepare for, react to and recover from a disaster</i>
Civilian (age 16+) unemployed	●	○	●	○	
Per capita income	○	●	●	●	
Persons (age 25+) with no H.S. diploma	○	●	●	○	
Household Vulnerability					
Persons aged 65 and older	○	○	○	○	<i>Seniors, children and single parents are more vulnerable to a disaster than other population groups</i>
Persons aged 17 and younger	○	●	○	○	
Civilian noninstitutionalized population with a disability	○	○	○	○	
Single parent household with children under 18	○	○	●	○	
Minority Status and Language Vulnerability					
Minority (all persons except white, non-Hispanic)	●	●	●	●	<i>Access to information can be a challenge for those with language barriers</i>
Persons (age 5+) who speak English "less than well"	○	●	○	○	
Housing and Transportation Vulnerability					
Housing in structures with 10 or more units	○	○	○	○	<i>Access to transportation and quality housing that is outside of designated risk zones reduces vulnerability</i>
Mobile homes estimate	○	○	○	○	
At household level, more people than rooms	○	●	○	○	
Households with no vehicle available	○	○	○	○	
Persons in institutionalized group quarters	○	○	○	○	
Overall Social Vulnerability					
Vulnerability ranking	●	●	●	●	
	94%	86%	99%	94%	
<i>(75% and over indicates social vulnerability)</i>					

ABOVE: Social Vulnerability Index
 ● Tracts in the top 10%, or at the 90th percentile (Indicate high vulnerability)
 ○ Tracts below the 90th percentile
 Source: *Social Vulnerability Index (2014)*,
<https://svi.cdc.gov/map.aspx>

The East Houston Super Neighborhood has a very high Social Vulnerability Index as developed by the ATDSR of the Centers for Disease Control utilizing 2014 Census data. Social vulnerability refers to the resilience of communities when confronted by external stresses on human health, including natural or human-caused disasters. The social vulnerability index is the “degree to which a community exhibits certain social conditions, including high poverty, low percentage of vehicle access, or crowded households.” Each of these conditions can impact a community’s ability to recover.

The East Houston Super Neighborhood includes four Census tracts: 2310, 2311, 2312 and 2313. An analysis of the specific social vulnerabilities are provided in the table to the left. Each of the four Census tracts that comprise the neighborhood are in the highest vulnerability category, averaging 93% compared to tracts across the United States.



ABOVE: East Houston Census Tract Map
BELOW: Mesa Road, Harvey
Photo by Juan Antonio Sorto



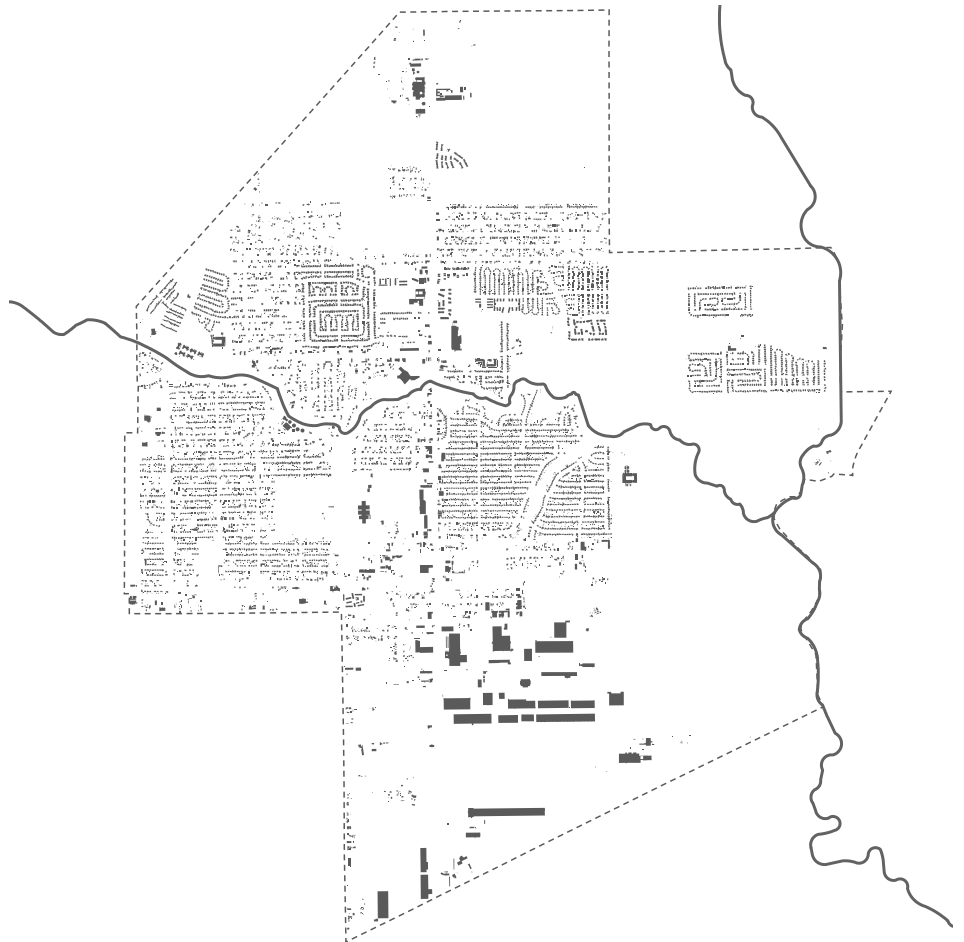


Context

The East Houston Super Neighborhood developed slowly and unevenly. The neighborhood is characterized by areas of dense residential subdivisions in the central portion of the community, industrial land uses on the south, and virtually untouched natural areas to the east.

Houston is one of the most ecologically diverse urban areas in the United States. The forests, prairies, savannas, bayous, bottomlands, and coastlines in the region comprise ten different eco-regions. The East Houston Super Neighborhood is where the Piney Woods and prairie eco-regions meet. Towering pines perfume the air and blanket the ground with needles.

Halls Bayou runs through the center of the East Houston neighborhood and Greens Bayou defines the eastern boundary.



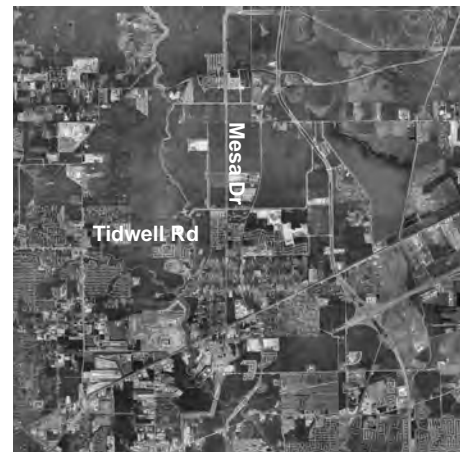
RIGHT: Figure Ground Map
BELOW, Left to Right: East Houston 1944,
1978 and 2002
OPPOSITE PAGE: East Houston Aerial 2017



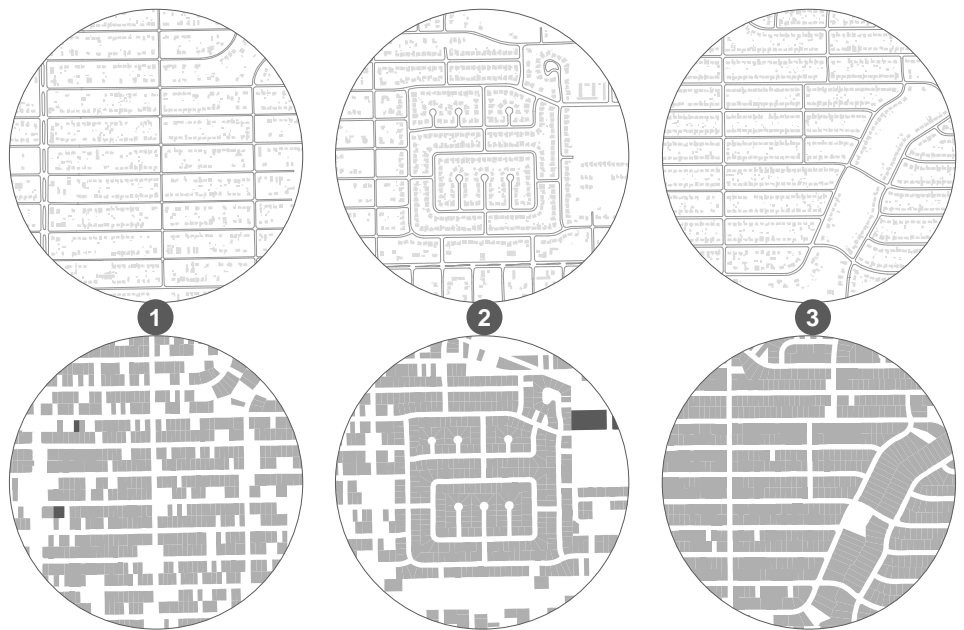
1944



1978



2002



ABOVE, Right: Detailed Context Analysis

■ Single Family Lot

■ Multi-Family Lot

□ Vacant Lot

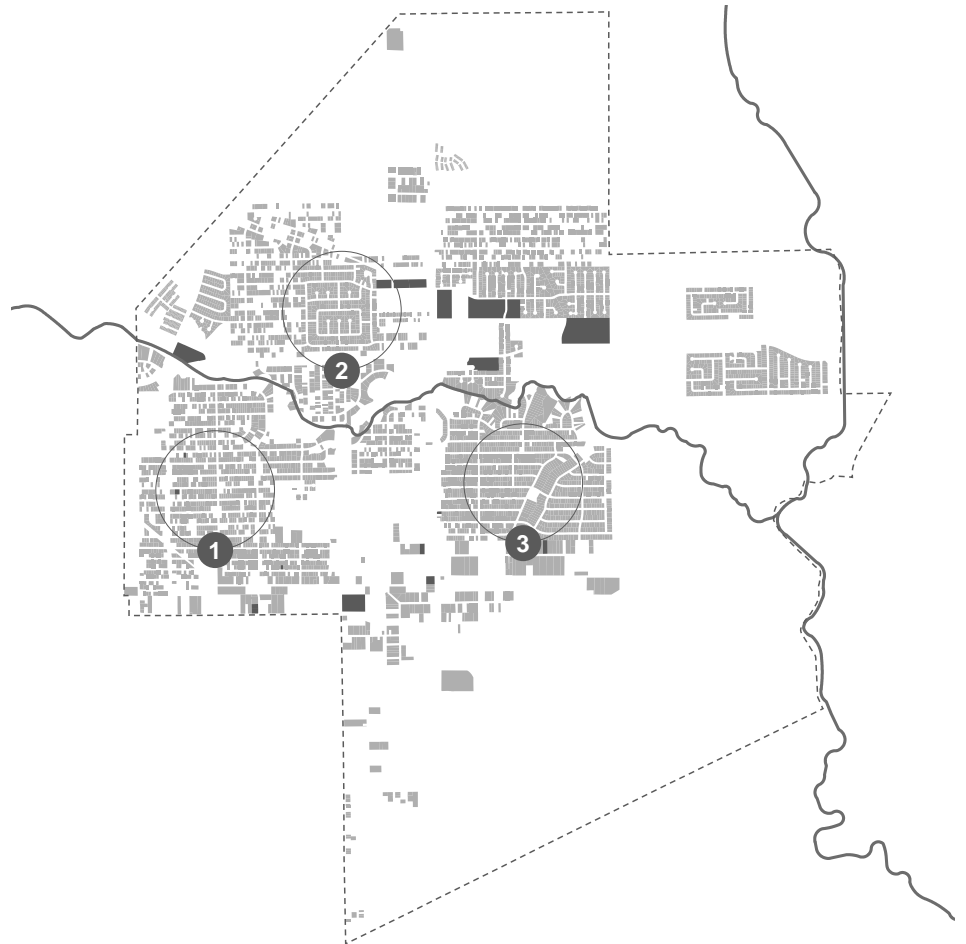
BELOW: Neighborhood Housing (Photo by Caroline Smith, Kaihan Chen, Peter Eccles, Vilma Umazor, Yan Lu)



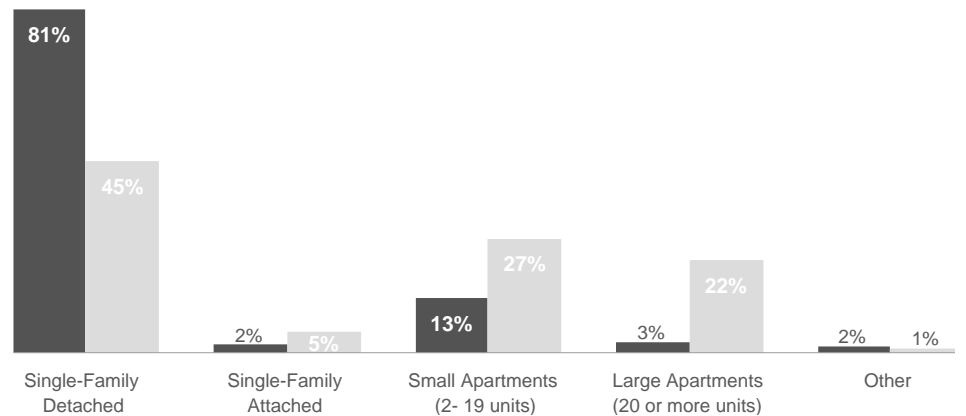
The East Houston neighborhood is a community of homes. In 2016, single family homes made up over 80% of all housing units, compared to 45% in Houston. Large apartments comprise just 3% of all housing in the East Houston neighborhood, compared to 22% in Houston.

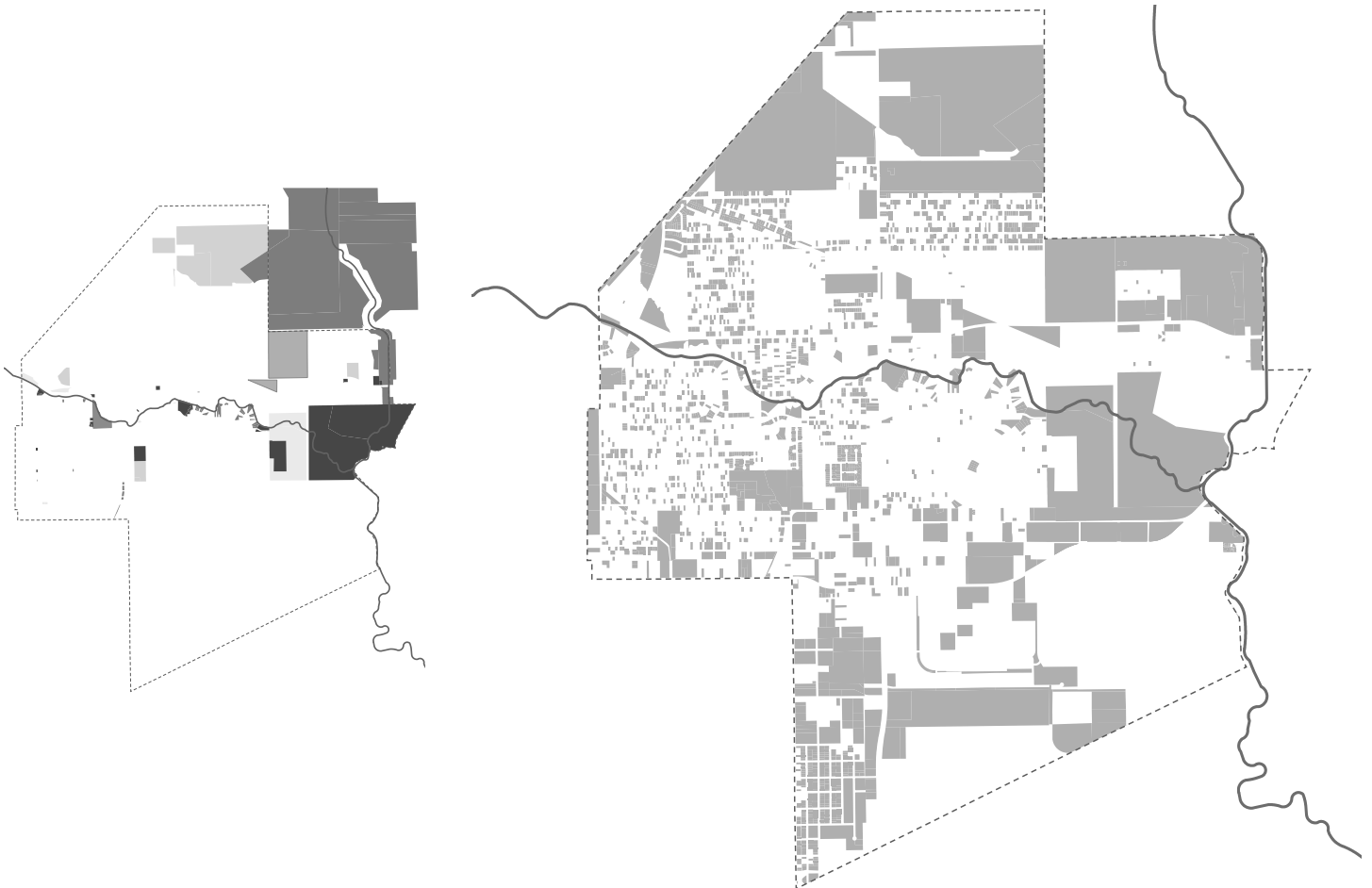
The median year that housing was constructed ranges from the late 1950s to the late 1970s, a time of rapid growth in the city of Houston.

There is substantial diversity in housing developments across the neighborhood. Several subdivisions are large and fully developed, with very little vacant land. In other subdivisions, vacant lots are scattered throughout the development creating a patchwork. Vacant lots are both an opportunity and a constraint, representing potential but also challenges. This patchwork of undeveloped land and subdivisions also occurs at the neighborhood scale. The diversity of the landscape is represented in the detailed context diagrams to the left.



ABOVE, Right: Residential Land Use Map
 ■ Single Family
 ■ Multi-Family
 RIGHT: Housing by Type
 ■ East Houston Super Neighborhood
 ■ Houston
 Source: ACS 2016





ABOVE: Public and Non-Profit Land Ownership

- City of Houston
- Harris County Flood Control District
- Harris County FWSD
- Houston Habitat for Humanity
- Houston ISD
- Houston Parks Board

ABOVE, Right: Vacant and Undeveloped Land

- Vacant Land

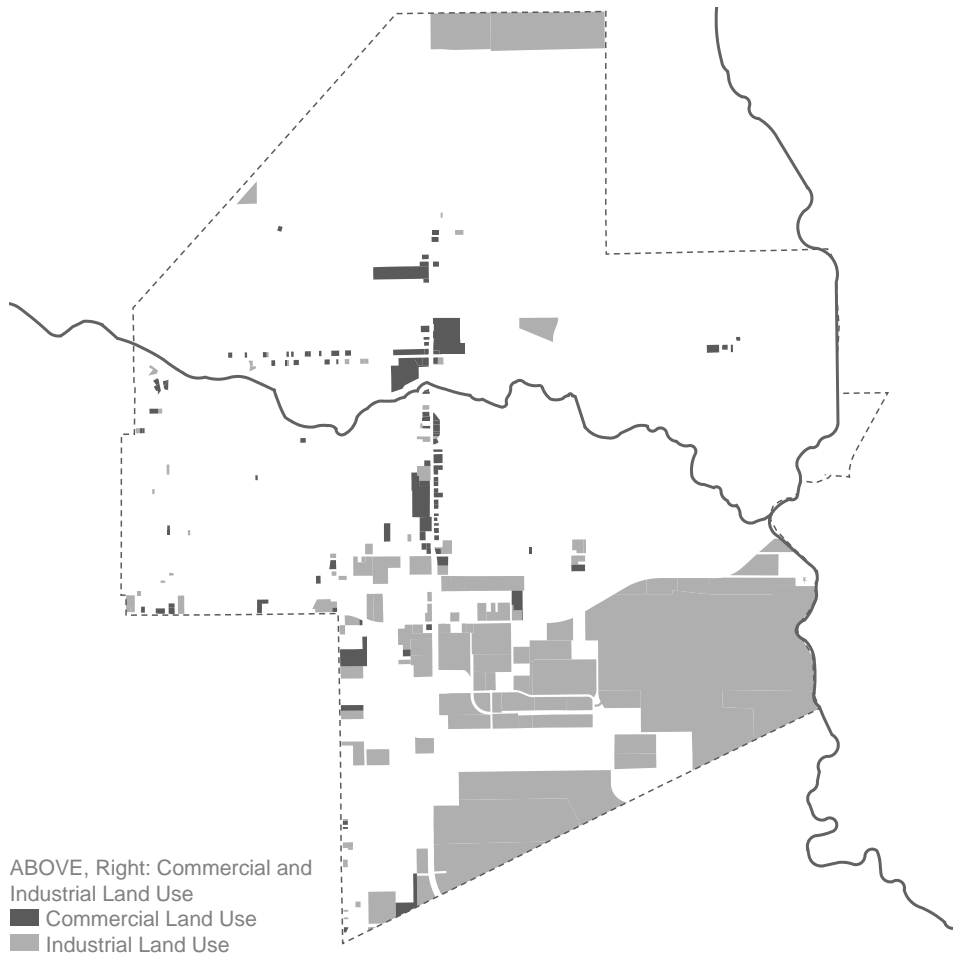
PHOTOS BELOW, Left to Right: Undeveloped Area, McCarty Landfill, Fiesta Mart
(Land Ownership Map Concept and Photos by Caroline Smith, Kaihan Chen, Peter Eccles, Vilma Umanzor, Yan Lu)

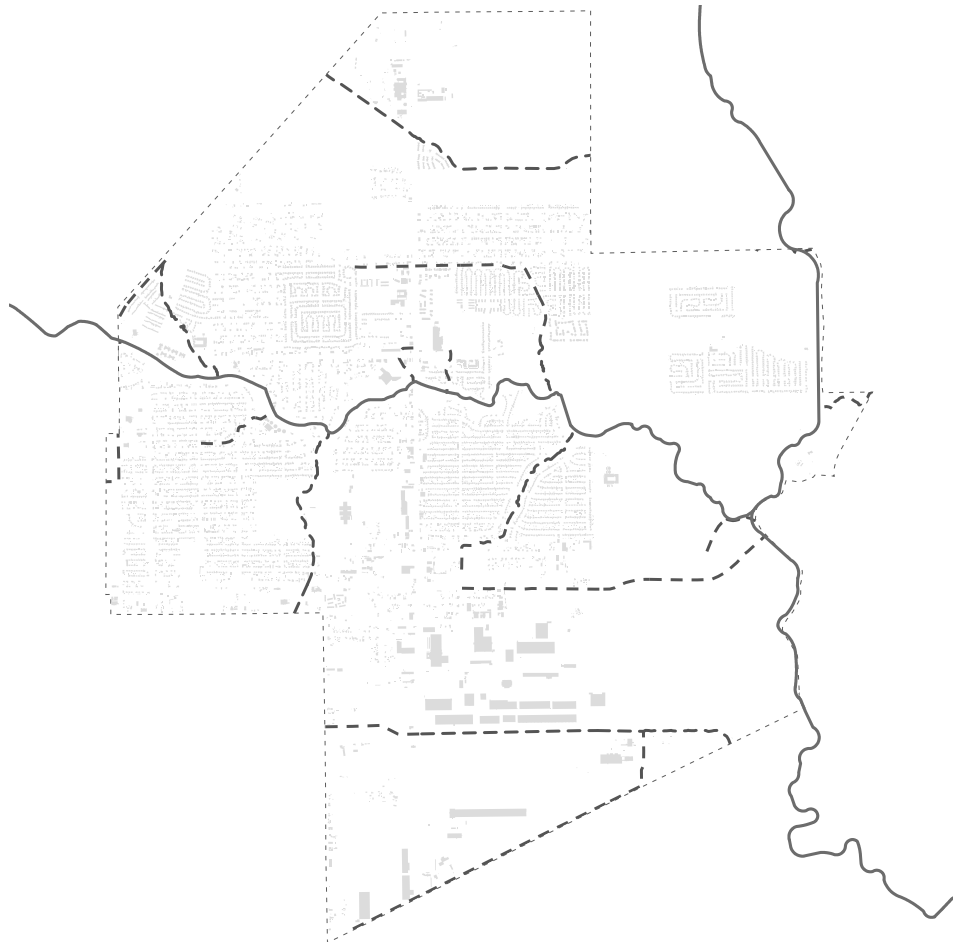


East Houston has an abundance of vacant and undeveloped land. A large amount of undeveloped land is owned by the Harris County Flood Control District, the Houston Parks Board, HISD or other public entities. Vacant land is concentrated on the eastern edges of the neighborhood. Yet, a patchwork of vacant lots are also scattered throughout the more developed sections of the neighborhood.

The primary commercial corridors in the neighborhood are Tidwell Road and Mesa Drive. However, there is very little commercial development in the community overall. The primary commercial hub is located at the intersection of Tidwell Road and Mesa Drive, where the Fiesta Mart is located. Fiesta flooded during Hurricane Harvey and took several months to re-open. This is the only grocery store in the neighborhood.

Industrial land uses, including a solid waste dumping facility, are located on the southern edges of the community adjacent to the Beaumont Highway.





ABOVE: Map of Bayous and Drainage Easements



The East Houston Super Neighborhood has one Harris County park and six City parks, including the expansive 355-acre Brock Park and Golf Course. The Brock Park Golf Course has been closed since June 2016 after receiving flood damage. Nearly all of the parks are sited near Halls Bayou.

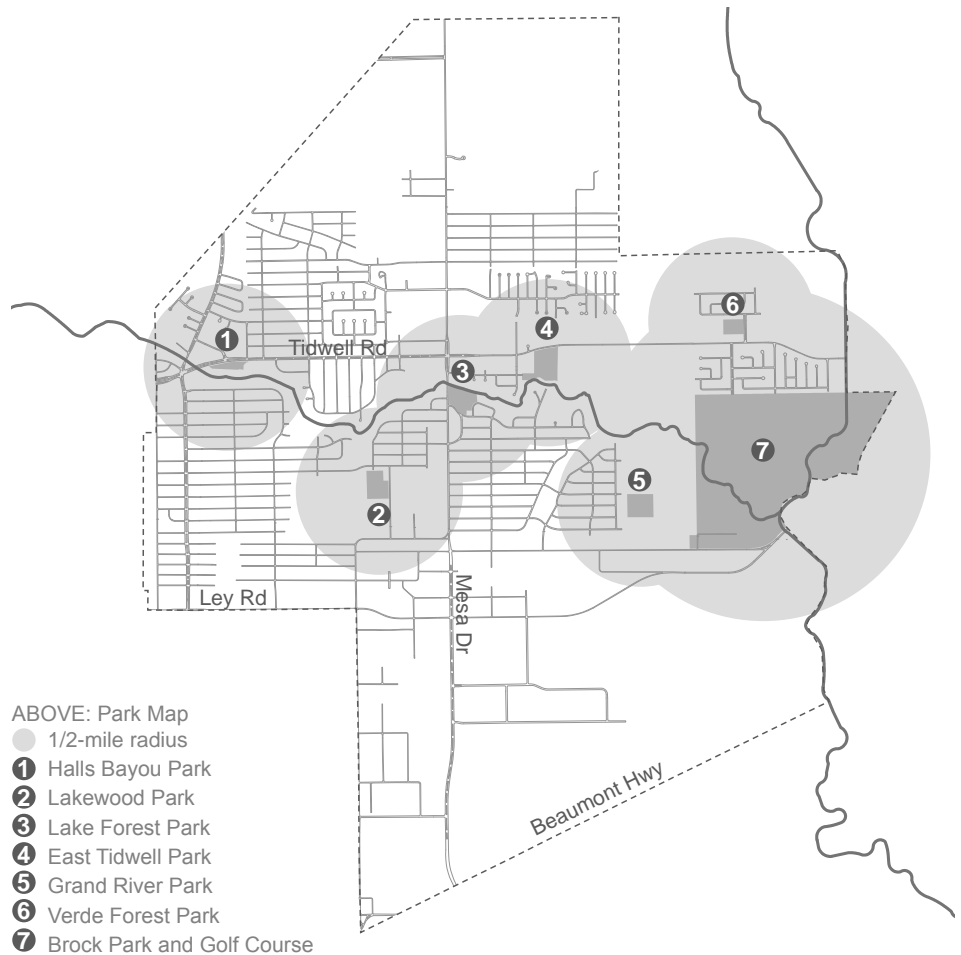
The combined park area for the neighborhood (not including Brock Park) is 51 acres. The City of Houston's 2015 Parks and Recreation Master Plan recommended 2.5 acres of neighborhood, community and pocket parks per 1,000 people. Based on this standard the East Houston neighborhood has adequate parks.

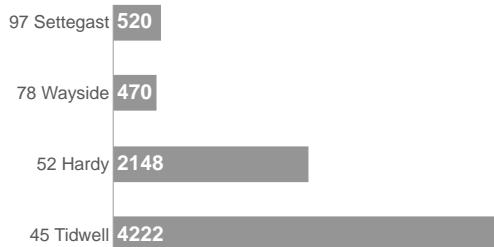
Even with the abundance of park area there are many portions of the neighborhood that do not have easy access to a park. Approximately 30% of people live more than a 10-minute walk of a park.

The Lakewood Neighborhood Library, located in Lakewood Park, flooded during Harvey and is temporarily at the Northeast Multi-Service Center.

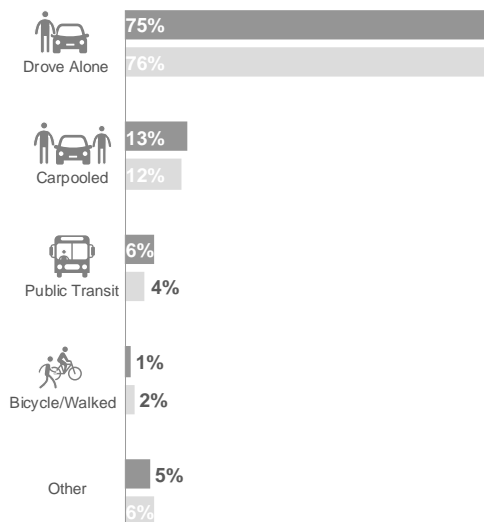
Drainage systems in the neighborhood scale down from Halls and Greens Bayou, to a series of gullies and ditches, to the street and lot drainage systems. Each of these systems must be understood independently and in total.

PHOTOS, From Left to Right: Lakewood Park, Lake Forest Park, Halls Bayou Greenway (Lakewood Park and Halls Bayou Greenway Photos by Caroline Smith, Kaihan Chen, Peter Eccles, Vilma Umanzor, Yan Lu)





East Houston Bus Route Ridership



ABOVE: Means of Transportation to Work, 2016

■ East Houston
 ■ Houston

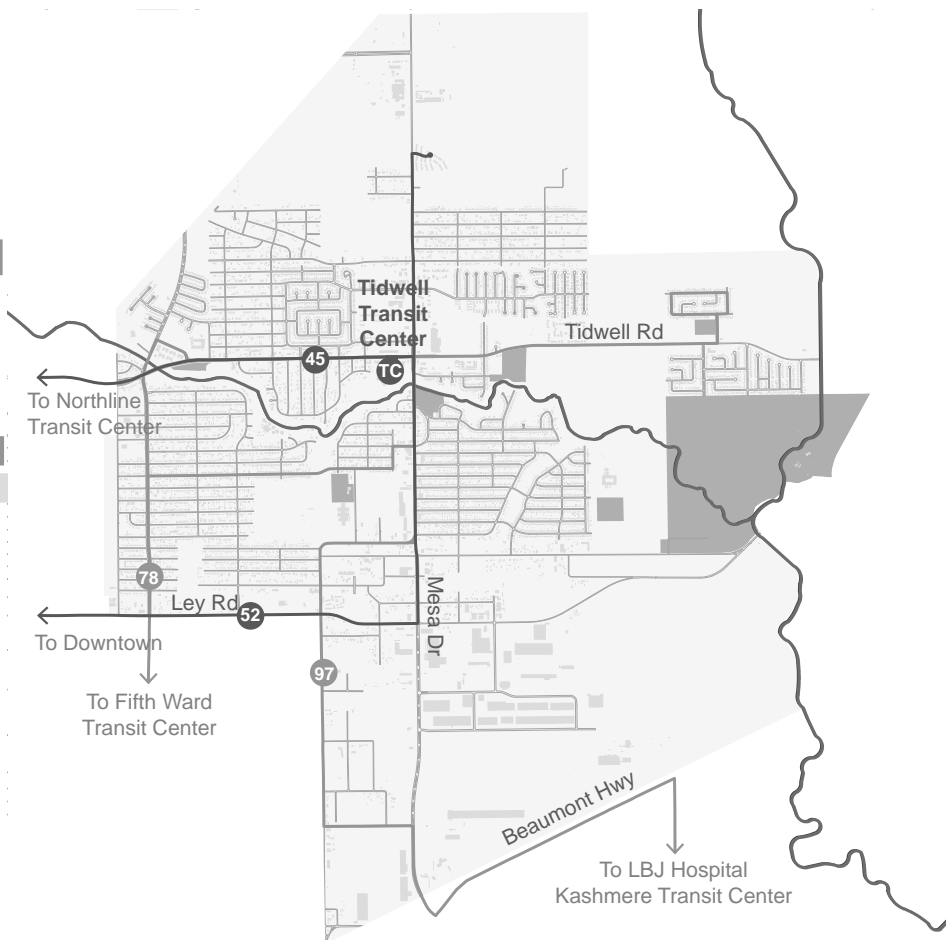
ABOVE, Right: Transit Map

— Mid-Frequency Bus Route (30 min)

— Low-Frequency Bus Route (60 min)

■ Parks

(Bus Ridership Data by Caroline Smith, Kaihan Chen, Peter Eccles, Vilma Umanzor, Yan Lu)

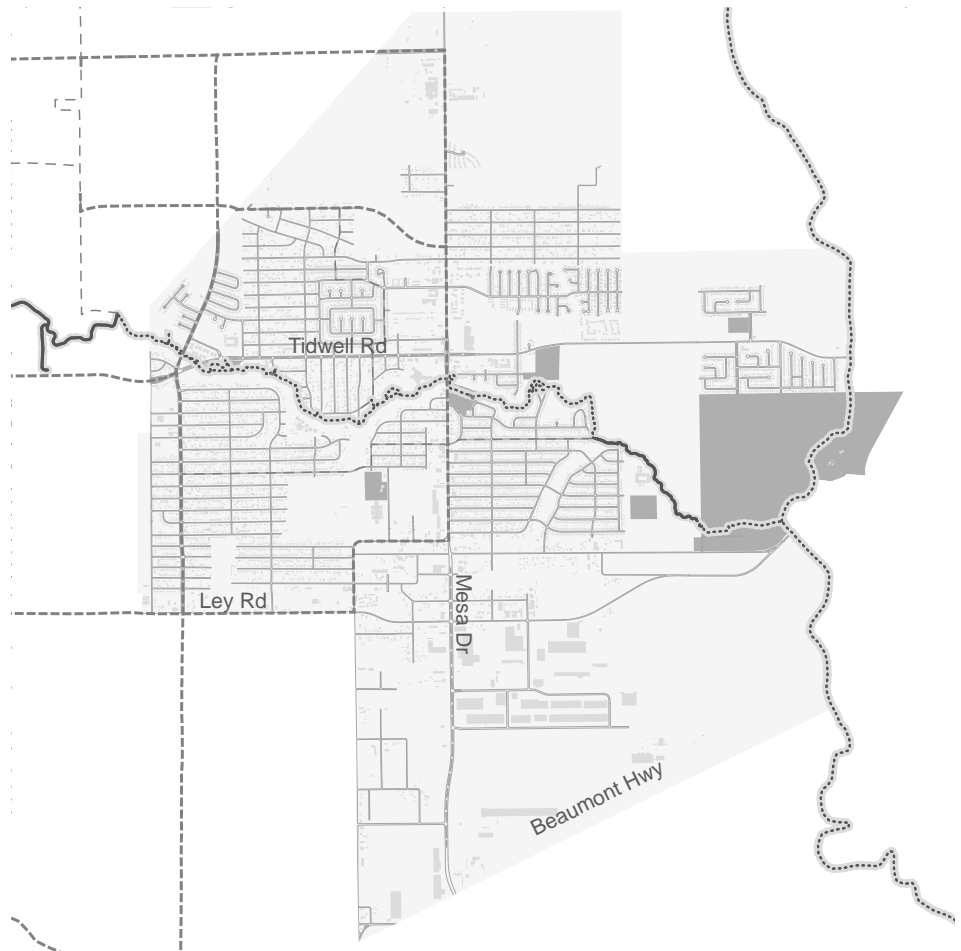


The East Houston Super Neighborhood is served by four METRO bus routes: 97 Settegast; 78 Wayside; 52 Hardy; and 45 Tidwell. The 52 Hardy and 45 Tidwell are mid-frequency routes connecting to downtown and other major destinations. These routes run every 30 minutes and have the highest ridership. The 78 and 97 run every 60 minutes and have the lowest ridership. The Mesa Transit Center is a hub of activity, located adjacent to the Fiesta Mart near the intersection of Mesa Drive and Tidwell Road.

In 2016, 75% of East Houston workers over the age of 16 years drove alone to get to work, which is just slightly lower than the 76% in Houston overall. 6% of workers used public transit to get to work, which is slightly higher than the 4% in the City of Houston. Very few East Houston workers walk or bike to work.

The Halls Bayou Greenways are currently under construction. When complete, four miles of hike and bike trails will link east and west across the community connecting to area parks, Greens Bayou, Brock Park and Forest Brook Middle School to the west.

The neighborhood is currently without any on-street bike routes or lanes. The Houston Bike Plan proposes dedicated on-street routes along Mesa Drive, Wayside Drive, Little York Road and Ley Road. Off-street routes are proposed along Weedlyn Road and Guest, Hill and Haddlock Streets.

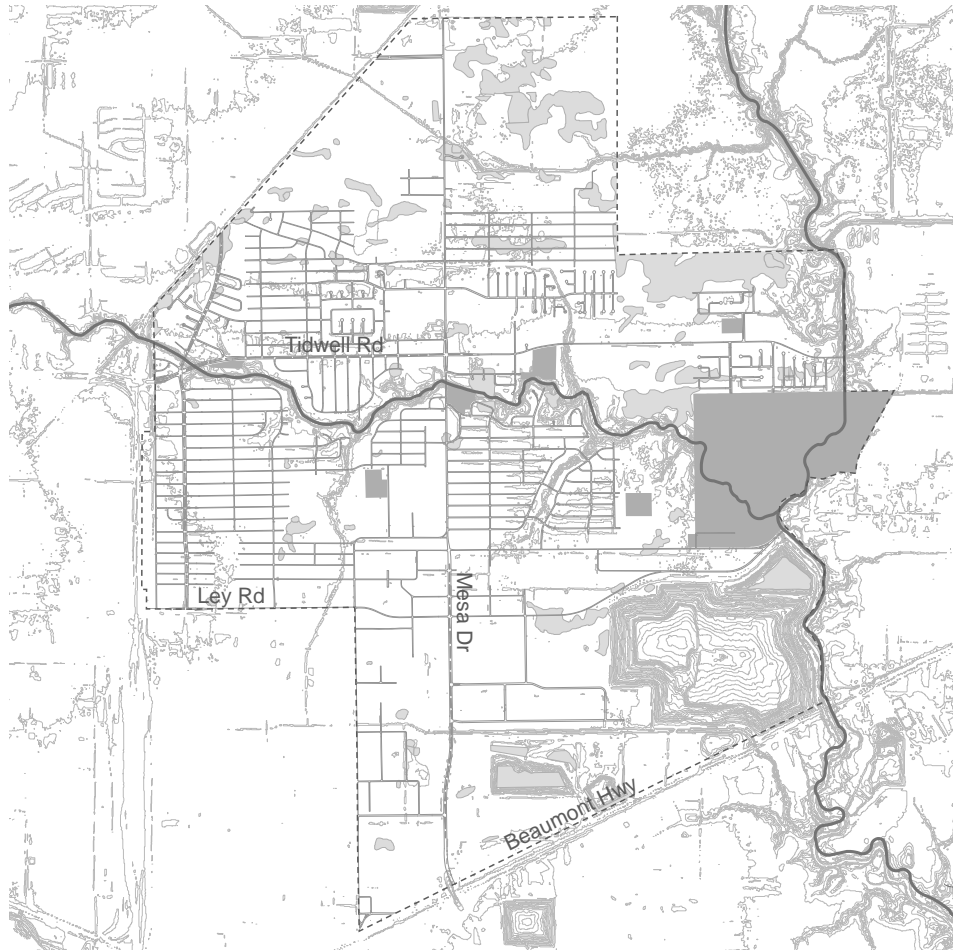


ABOVE: Proposed Bike Lanes and Bayou Greenways

- Off-Street
- - - Dedicated On-Street
- . - Shared On-Street
- Parks

PHOTOS, Left to Right: Mesa Transit Center and Halls Bayou Greenway
(Photos by Caroline Smith, Kaihan Chen, Peter Eccles, Vilma Umanzor, Yan Lu)





ABOVE: Topography and Wetlands Map

■ Wetlands

■ Parks

RIGHT: Whispering Pines Landfill Protest, 1978

OPPOSITE PAGE, Top Right: Map of Active and Closed Landfills

(Source: HGAC Closed Landfill Inventory)

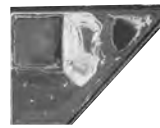
OPPOSITE PAGE, Bottom: McCarty Road Landfill



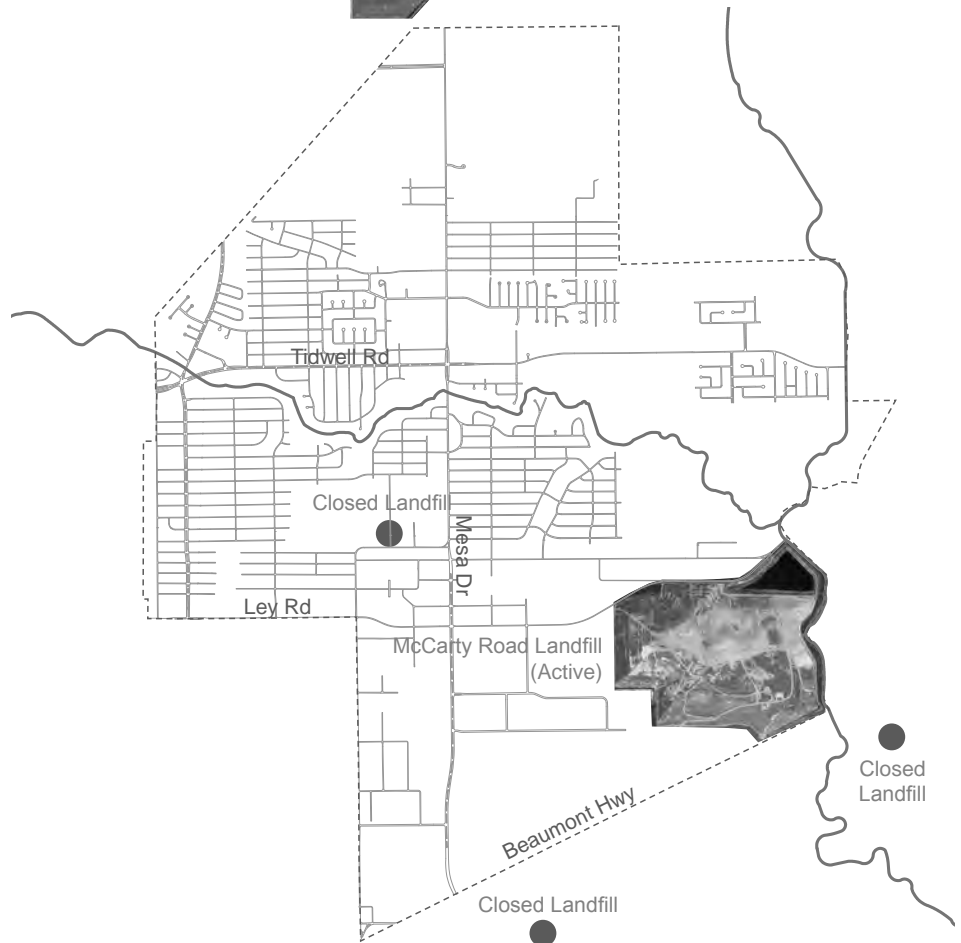
The East Houston Super Neighborhood has a diverse ecology, located where the Piney Woods meet the prairie. Wetlands and forests define the northeast portion of the neighborhood. The area is also home to a number of environmental hazards, including two landfills—the Whispering Pines landfill (now closed) and the McCarty Road landfill.

In 1978, residents of the Northwood Manor subdivision began protesting plans for the Whispering Pines landfill (now closed). The landfill was located just northwest of the East Houston Super Neighborhood boundaries. Residents took the fight to court, and the case dragged on for years. The court case was lost in 1985 and the Whispering Pines landfill was built. Today, there are four closed landfills in the East Houston Super Neighborhood area, and one active landfill.

In 1977, the McCarty road landfill opened on the south side of the neighborhood. In 2010, Constance Parten of CNBC reported that the landfill was the eighth largest in the United States. At this time, the site processed over 7,200 tons of garbage a day and was expected to remain open until 2048. Gas captured from the landfill is carried through a six-mile pipeline to the Anheuser-Busch brewery to help generate steam energy for the brewery's power plant. More than 55 percent of the brewery's fuel demand is supplied by this alternative fuel source.



Whispering Pines Landfill
(Closed)



	East Houston			Houston		
	2000	2010	2016	2000	2010	2016
Total Population	19,748	20,338 3%	20,867 3%	1,953,631	2,068,026 6% Change	2,240,582 8% Change
Population Density (per Sq Mile)	1,503	1,556	1,596	3,372	3,449	3,737
Race/Ethnicity						
White	6%	2%	4%	31%	26%	26%
Black or African American	70%	67%	61%	25%	23%	23%
Asian	0%	0%	0%	5%	6%	6%
Hispanic or Latino	23%	31%	34%	37%	44%	44%
Other	1%	0%	1%	2%	2%	1%
Age						
17 Years or Younger	35%	34%	28%	28%	26%	25%
18 - 64 Years Old	59%	58%	62%	64%	65%	65%
65 Years or Older	6%	8%	10%	8%	9%	10%
Place of Birth						
Born Outside of the United States	12%	18%	14%	28%	29%	26%
Means of Transportation to Work						
Drove Alone	69%	74%	76%	72%	74%	76%
Carpooled	21%	19%	19%	16%	14%	12%
Public Transportation	6%	6%	6%	6%	5%	4%
Bicycled and Walked	1%	1%	1%	3%	3%	3%
Other	2%	2%	2%	1%	2%	2%
Educational Attainment 25 Years +						
Less Than High School	44%	40%	29%	30%	26%	23%
High School Graduate (includes equivalency)	32%	33%	39%	20%	23%	23%
Some college	20%	22%	23%	23%	23%	24%
Bachelor's degree	4%	3%	5%	17%	18%	19%
Master's degree	1%	2%	2%	6%	7%	8%
Other Professional School Degree	1%	0%	1%	4%	4%	4%
Median Household Income	\$26,012	\$32,824	\$32,801	\$36,616	\$44,124	\$47,010
Percent of Houston's Median	71%	74%	70%			
Percent of Population Below Poverty	31%	25%	22%	19%	18%	19%
Housing Units						
Occupied	94%	87%	87%	92%	86%	89%
Vacant Housing Units	6%	13%	13%	8%	14%	11%
Tenure						
Percent Owners	63%	62%	60%	46%	45%	43%
Percent Renters	37%	38%	40%	54%	55%	57%
Households without access to a vehicle	16%	10%	13%	12%	10%	9%
Persons per Household	3.4	3.3	3.2	2.7	2.7	2.7

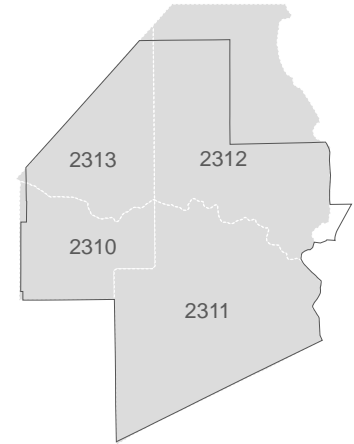
Sources: Census 2000, ACS 2010, ACS 2016

Demographics

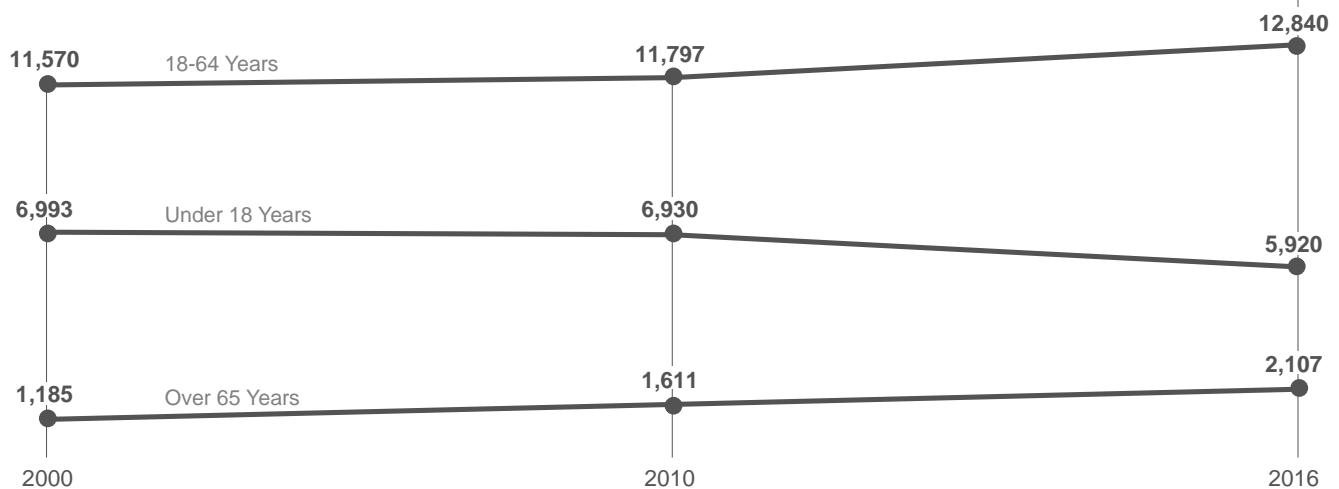
The East Houston Super Neighborhood is 10.7 square miles in area and was home to just under 21,000 people in 2016. The population density is approximately 1,600 people per square mile, which is considerably lower than the Houston average density of 3,737 people per square mile. The low population density of East Houston is a factor of the large tracts of industrial, vacant and undeveloped land inside the neighborhood boundaries.

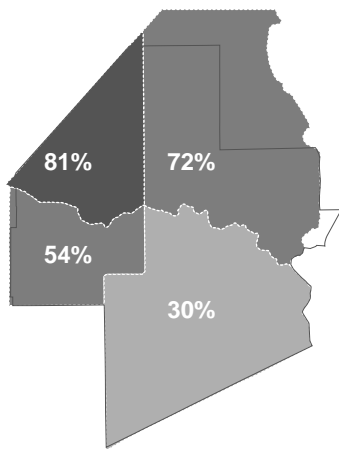
Between 2000 and 2016 the population of the East Houston Super Neighborhood steadily increased, rising from 19,748 to 20,867.

Since 2000, the number of residents under the age of 18 has declined and the number of seniors has increased. Specifically, the number of neighborhood children declined from 6,993 in 2000 to 5,920 in 2016, a 15% decrease. Over the same time period the number of residents over the age of 65 nearly doubled, from 1,185 in 2000 to 2,107 in 2016.

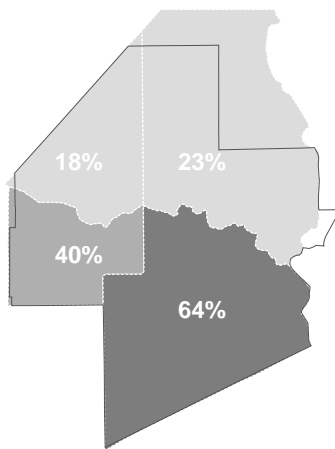


ABOVE: East Houston Census Tract Map
 BELOW: Population by Age, 2000-2016
 Sources: Census 2000, ACS 2010, ACS 2016

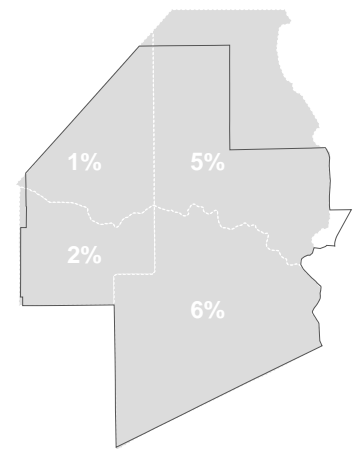




Percent Black/African American Population 2016



Percent Hispanic/Latino Population 2016



Percent White Population 2016

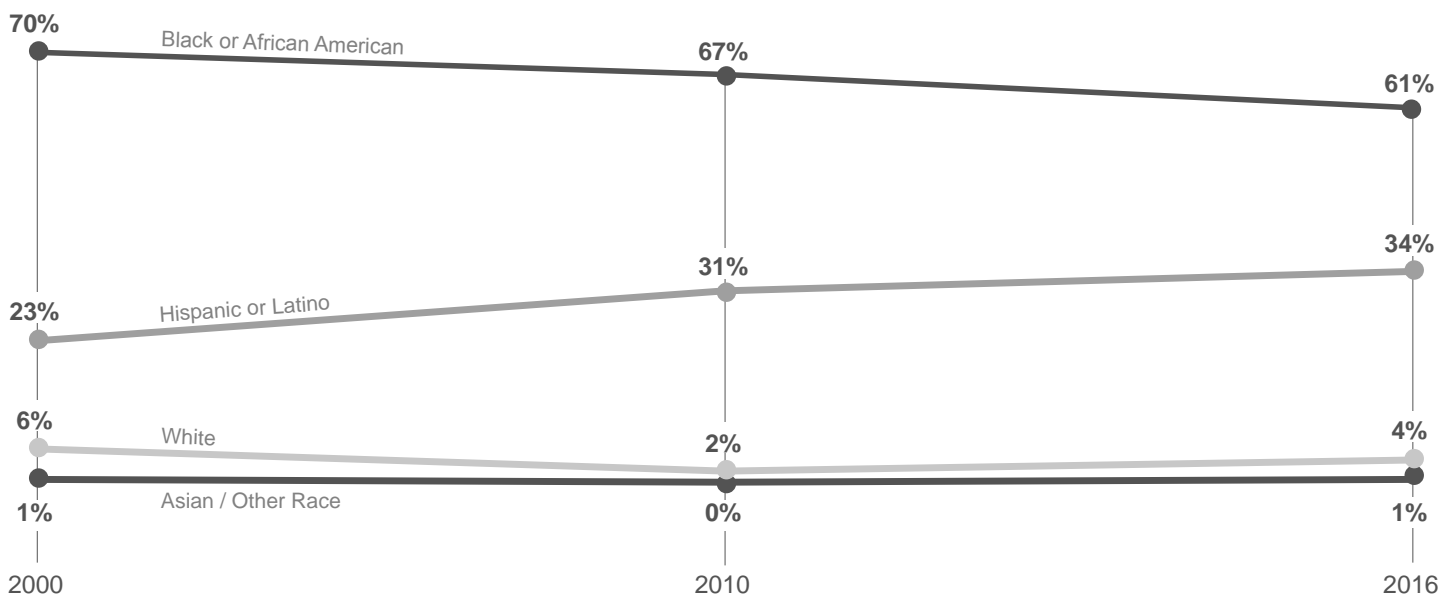


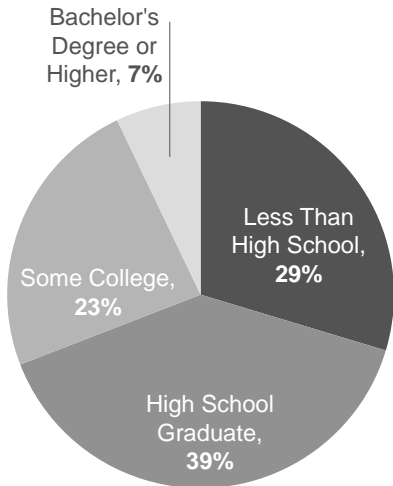
The East Houston Super Neighborhood is diverse. In the overall neighborhood the majority of residents (61%) are Black or African American, followed by 34% Hispanic or Latino, 4% White and 1% Asian or other race. Yet, the diversity of the neighborhood is complex, particularly when mapped by Census Tract (see maps to the left).

Since 2000 the ethnic composition of the neighborhood has changed, with the percent of Black or African American residents declining and the percent of Hispanic or Latino residents increasing (see chart below).

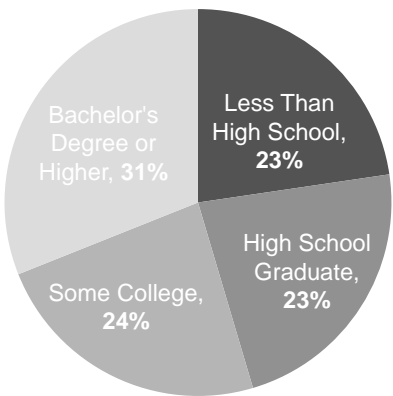
In 2016, 14% of residents were born outside of the United States, a number that has increased slightly since 2000. In Houston overall, 29% of residents were born outside of the United States in 2016.

BELOW: Percent Population by Race and Ethnicity in East Houston Super Neighborhood, 2000-2016
 OPPOSITE PAGE, Bottom Left: East Houston Recovery Meeting
 (Photos by Houston Housing and Community Development Department)

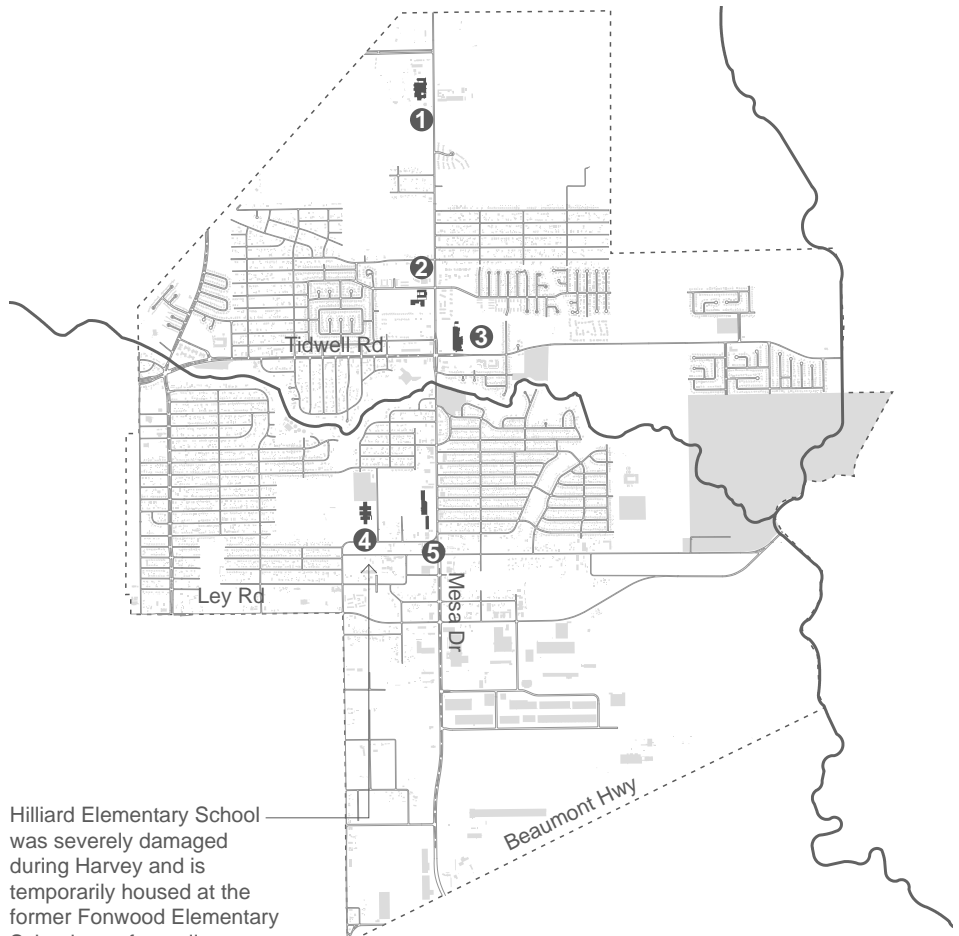




East Houston Super Neighborhood



Houston



Hilliard Elementary School was severely damaged during Harvey and is temporarily housed at the former Fonwood Elementary School over four miles away

ABOVE: Educational Attainment (25 Yrs +) 2016

ABOVE, Right: School Map

- ① North Forest High School
- ② Kirby Middle School
- ③ KIPP Legacy Prep, Voyage Academy for Girls, Polaris Academy for Boys, Northeast College Preparatory
- ④ Hilliard Elementary School
- ⑤ Varnett School (Charter)

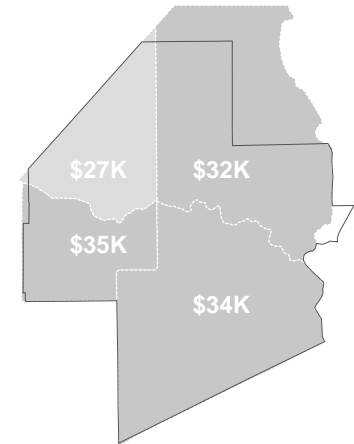
RIGHT: Hilliard ES
(Photo Houston Chronicle)



In 2016 the median household income in the East Houston Super Neighborhood was \$32,081, compared to \$47,010 in Houston. Income remains very similar across Census Tracts in the East Houston neighborhood.

In 2016, 22% of families living in East Houston had incomes below the federal poverty level. The percent of families living below poverty has declined since 2000, when 31% of families lived below poverty. In 2016 the Houston poverty rate was 19%.

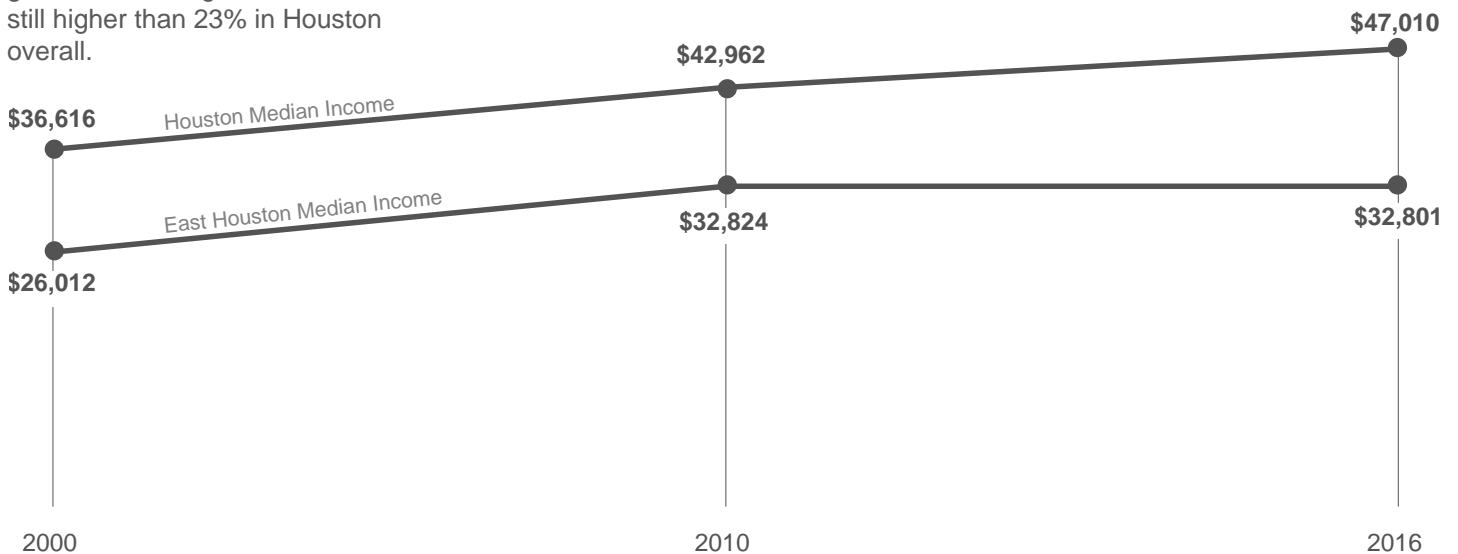
The East Houston Super Neighborhood has four public charter schools and three HISD public schools. HISD's Hilliard Elementary School was severely flooded during Harvey. Educational attainment in the East Houston Super Neighborhood has improved substantially since 2000 when 44% of residents over the age of 25 had not completed high school. By 2016, only 29% did not graduate from high school, a number still higher than 23% in Houston overall.



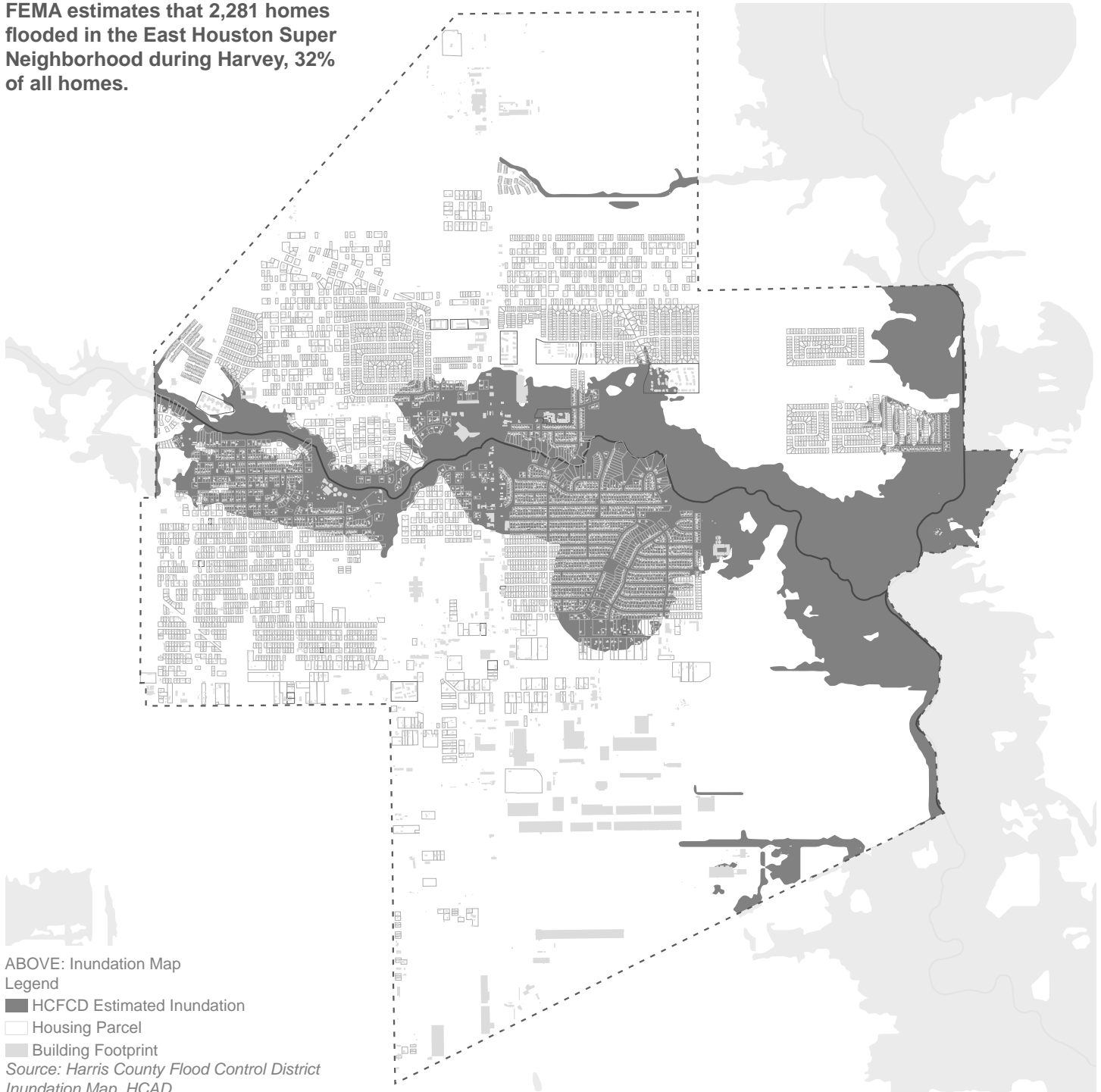
ABOVE: Median Household Income by Census Tract, 2016

BELOW: Median Household Income Over Time, Houston and East Houston Super Neighborhood

Sources: Census 2000, ACS 2010, ACS 2016



FEMA estimates that 2,281 homes flooded in the East Houston Super Neighborhood during Harvey, 32% of all homes.



ABOVE: Inundation Map
Legend

- HCFCF Estimated Inundation
- Housing Parcel
- Building Footprint

Source: Harris County Flood Control District
Inundation Map, HCAD

The East Houston Super Neighborhood is growing. Between 2000 and 2016 there was an 18% increase in the number of housing units, rising from 6,125 to 7,204. Vacancy rates for housing doubled between 2000 and 2010 from 6% to 12%, and then began to decline by 2016.

In 2016, 81% of all housing units were single-family detached homes. In the same year only 10% of all homes were in apartment buildings with five or more units. Not surprisingly, the home ownership rate in the neighborhood is very high, at 60%. In Houston 43% of households are homeowners.

The median age of homes in the neighborhood is approximately fifty years, with many structures built in the 1970s.

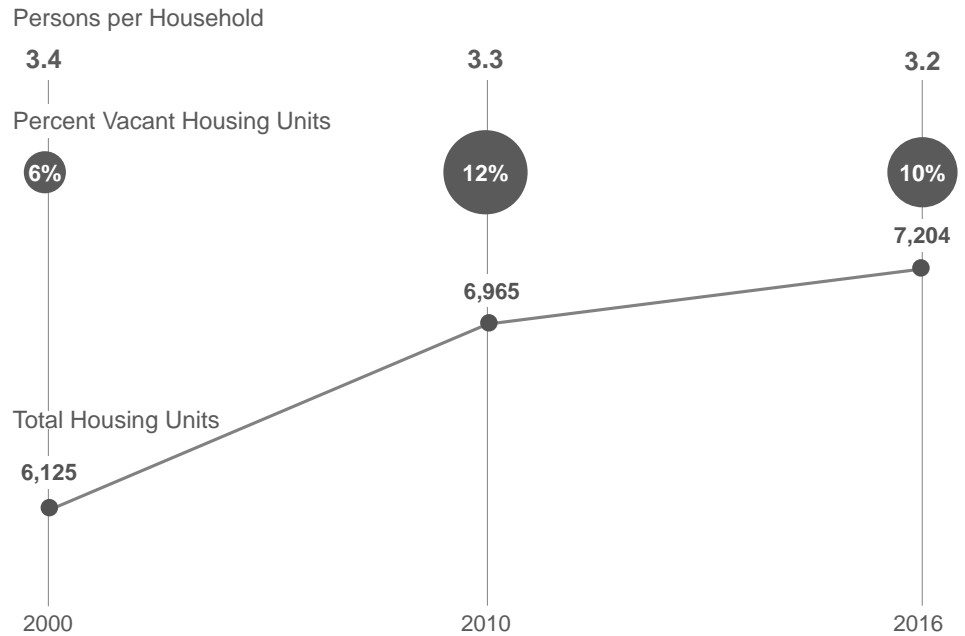
FEMA estimated that 32% of all homes in the East Houston Super Neighborhood were damaged by flooding from Hurricane Harvey.

BELOW: Persons per Household, Percent Vacant Housing Units, and Total Housing Units Over Time

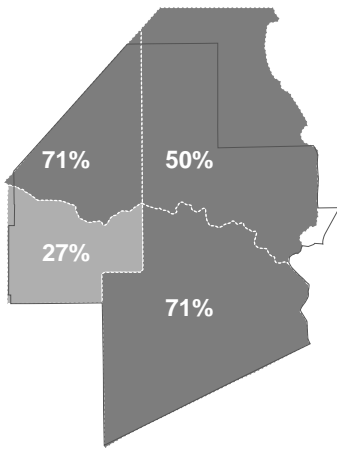
BOTTOM, Left: Tenure, Houston and East Houston Super Neighborhood, 2016

BOTTOM, Right: Flooded Home
(Photo by Caroline Smith)

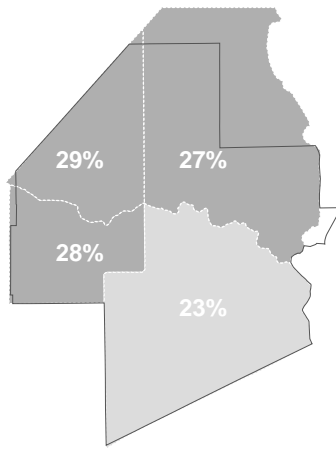
Sources: Census 2000, ACS 2010, ACS 2016



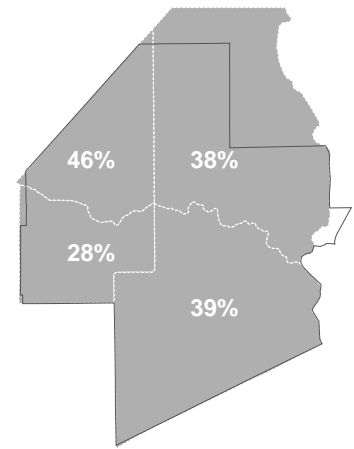
Housing cost burdens are a challenge for many families in Houston. In 2016, 38% of all households in the East Houston Super Neighborhood spent more than 30% of their income on housing. Renters in the neighborhood had a higher housing cost burden than owners, with 55% spending more than 30%. Housing cost burdens by tenure and Census Tract are illustrated in the maps below.



Percent of Renters Spending > 30% of Income on Housing, 2016



Percent of Home Owners Spending > 30% of Income on Housing, 2016



Percent of All Households Spending > 30% of Income on Housing, 2016



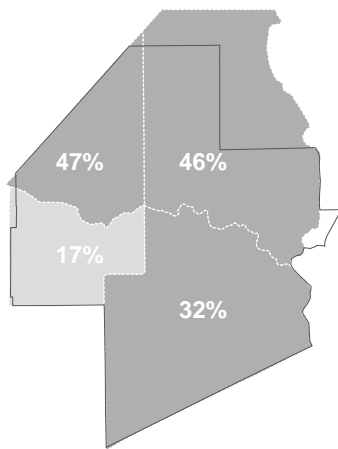
In addition to high housing costs the East Houston Super Neighborhood has a number of vulnerable populations, this includes children, seniors and single mothers.

For example, 1,087 families in East Houston (22% of the total) live on incomes below the federal poverty level. However, 672 of these families are female headed households with children, representing 62% of all families living below poverty.

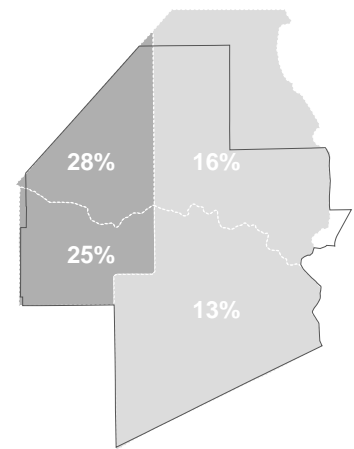
The poverty rate for the East Houston population under the age of 18 years is 39%, higher than Houston where 34% of children live in households with incomes below the poverty level. In addition, 21% of seniors in East Houston live in poverty, compared to 14% in Houston overall.

In 2016, 75% of residents were covered by health insurance, which is equal to the coverage rate in Houston.

BELOW, Photos Left to Right: East Houston Recovery Meeting and Harvey Flooding
 Photos by HCCD and Juan Antonio Sorto

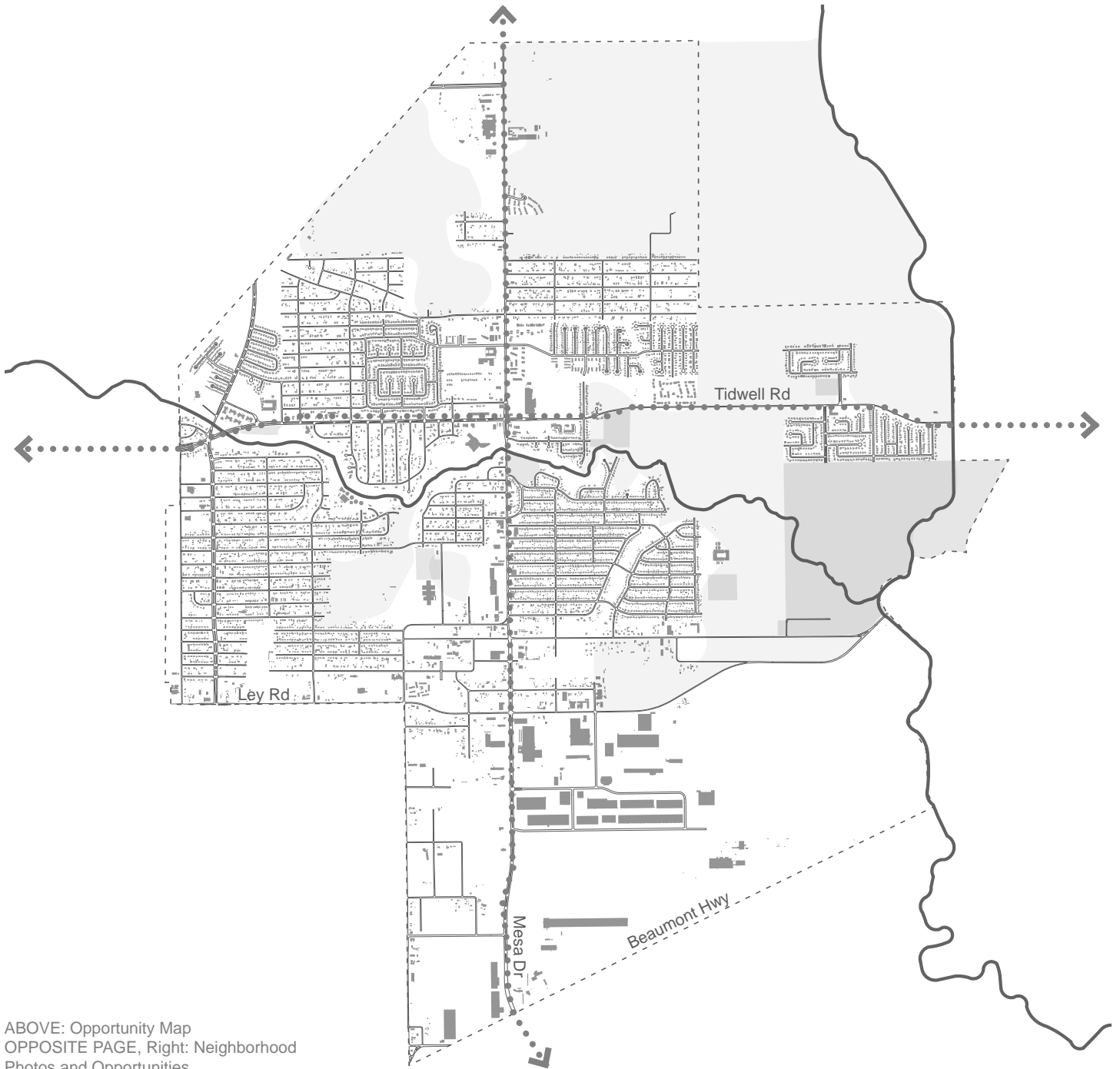


Percent of Children Living Below Poverty, 2016



Percent of Seniors Living Below Poverty, 2016





ABOVE: Opportunity Map
OPPOSITE PAGE, Right: Neighborhood
Photos and Opportunities
(Photos by Caroline Smith, Kaihan Chen, Peter
Eccles, Vilma Umanzor, Yan Lu)

Opportunities

At the time of publication it has been nearly a year since Hurricane Harvey began dumping rain at unprecedented rates and flooding much of Houston. City leaders report that over 150,000 homes were damaged by flood waters across the city. Lives, routines and resources were disrupted.

Important questions are being asked about how do we prepare for, react to and recover from disasters of this magnitude, both now and in the future? Furthermore, what can we do collectively to identify the opportunities and challenges in our communities?

It is critical to identify opportunities, across scales, that have the potential to reduce future risks, assist with recovery and lead to greater resiliency over time. By building on the assets of our communities, while understanding the challenges, we can develop strategies that create greater resiliency.

The East Houston Super Neighborhood, at the intersection of the Piney Woods and the prairie, is one of the few places in Houston with large tracts of pristine wilderness. Halls and Greens Bayou define the structure of the community, along with the two major corridors of

Tidwell Road and Mesa Drive. Neighborhoods of homes, schools, parks and commercial centers fill in the gaps.

The opportunities identified here build on the natural landscape, the bayous and the civic strength of the neighborhood. The opportunities also seek to mitigate flooding risks, expand economic opportunity, improve community amenities and transit access, while looking forward to more resilient housing and neighborhood models.



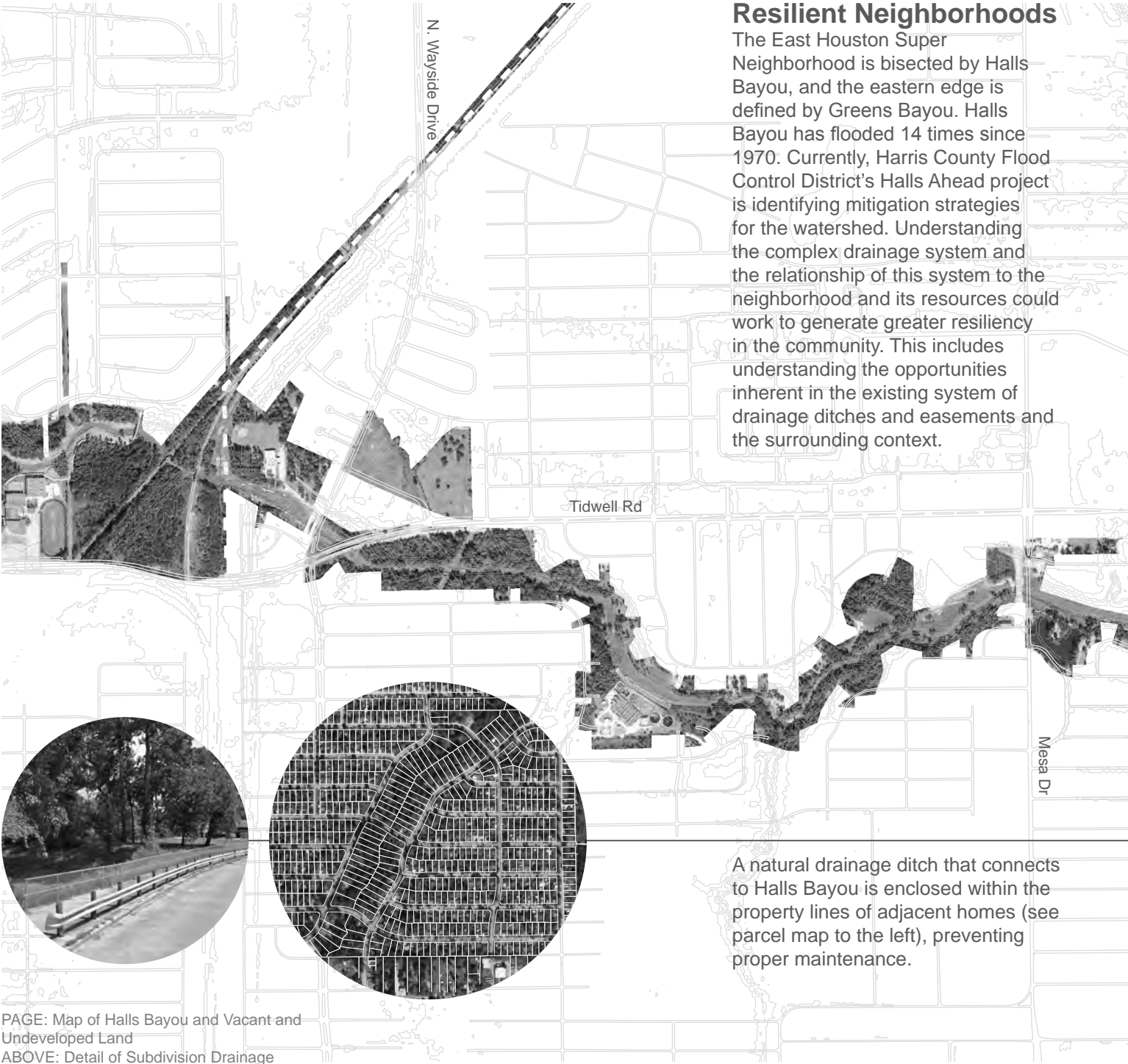
NEIGHBORHOOD SCALE



BLOCK SCALE



BUILDING SCALE

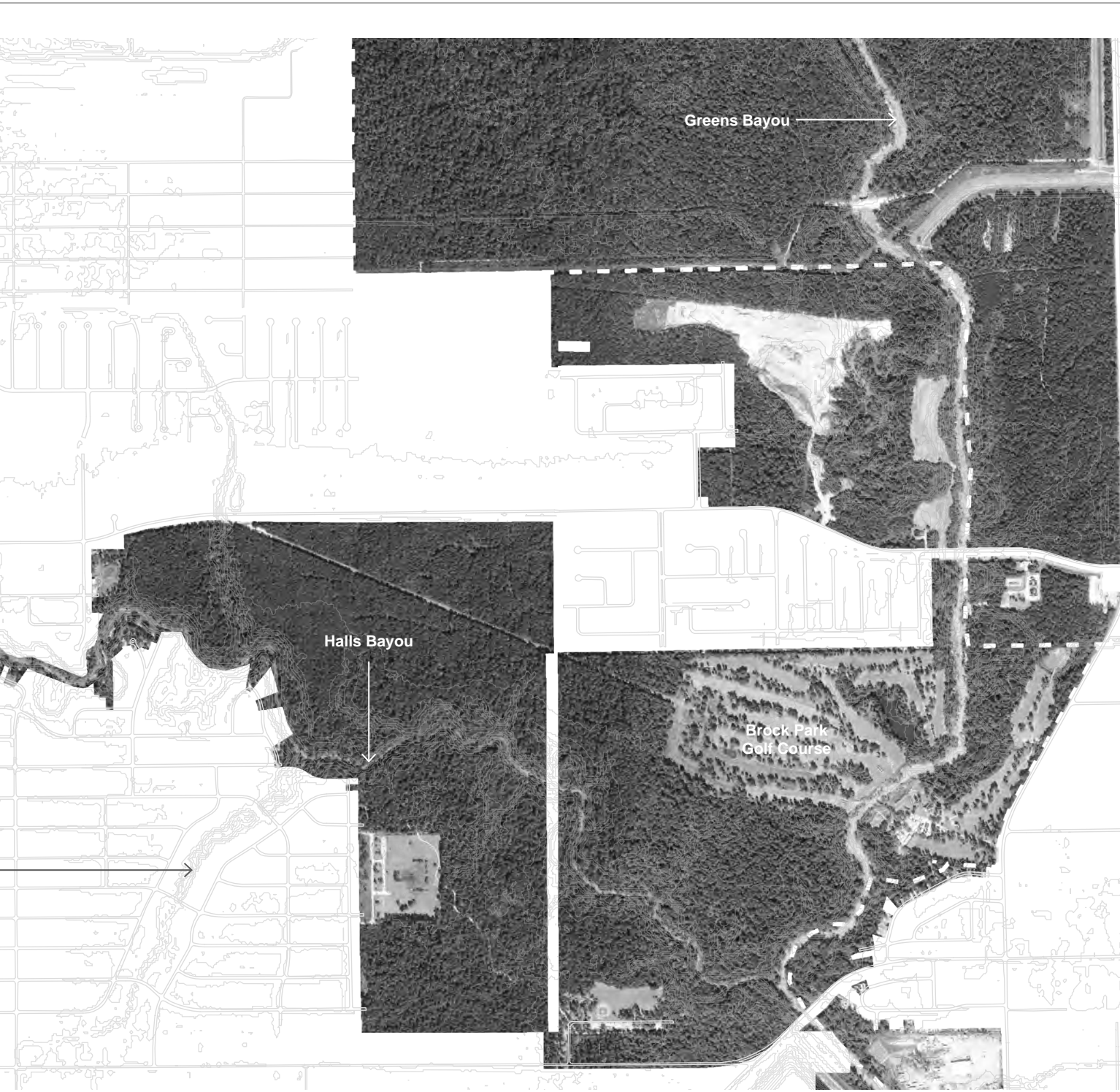


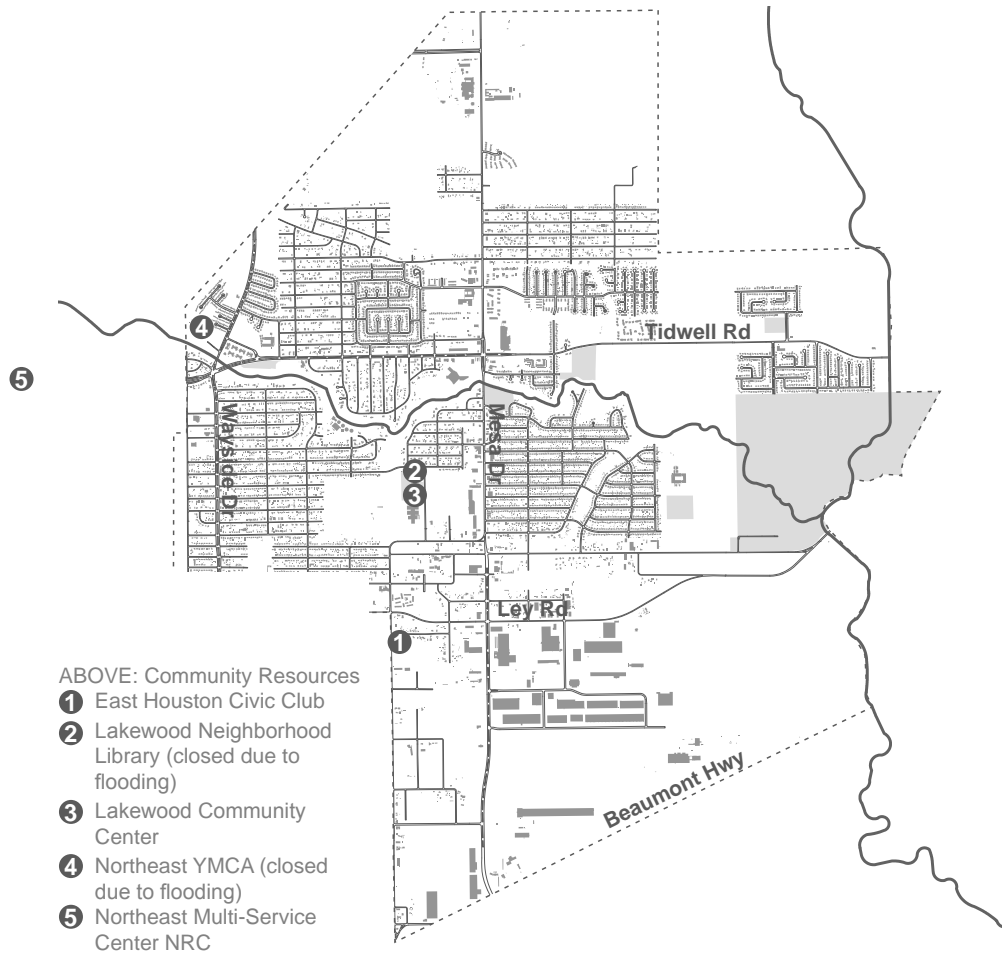
Resilient Neighborhoods

The East Houston Super Neighborhood is bisected by Halls Bayou, and the eastern edge is defined by Greens Bayou. Halls Bayou has flooded 14 times since 1970. Currently, Harris County Flood Control District's Halls Ahead project is identifying mitigation strategies for the watershed. Understanding the complex drainage system and the relationship of this system to the neighborhood and its resources could work to generate greater resiliency in the community. This includes understanding the opportunities inherent in the existing system of drainage ditches and easements and the surrounding context.

A natural drainage ditch that connects to Halls Bayou is enclosed within the property lines of adjacent homes (see parcel map to the left), preventing proper maintenance.

PAGE: Map of Halls Bayou and Vacant and Undeveloped Land
ABOVE: Detail of Subdivision Drainage





ABOVE: Community Resources

- ① East Houston Civic Club
- ② Lakewood Neighborhood Library (closed due to flooding)
- ③ Lakewood Community Center
- ④ Northeast YMCA (closed due to flooding)
- ⑤ Northeast Multi-Service Center NRC



Neighborhood Center

In the aftermath of Hurricane Harvey the City of Houston, in partnership with organizations across the city, opened twelve Neighborhood Restoration Centers (NRCs). The Centers provide for basic needs and connect people to recovery resources. The closest center to East Houston is at the Northeast Multi-Service Center, approximately 2.5 miles west on Tidwell Road.

Inside the East Houston neighborhood, recovery has been championed by the East Houston Civic Club. Established in 1936, this active civic organization is located on East Houston Road just south of Ley Road. Since Hurricane Harvey the Civic Club has served as a distribution point for critical needs such as food and diapers, as well as hosting resource fairs and other events focused on recovery.

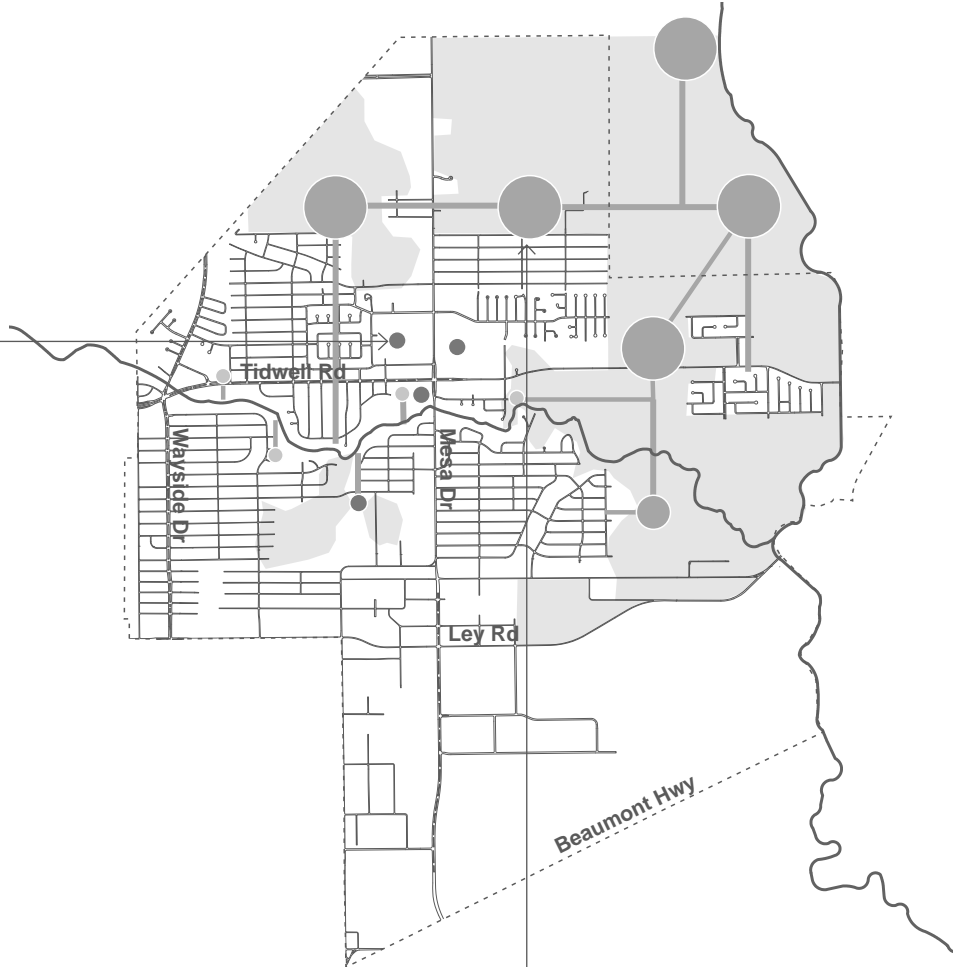
While the efforts of the Civic Club are critical, an inventory of public facilities in the neighborhood that could be activated to assist families in the wake of future disaster is also imperative. A number of public facilities were flooded during the storm, including the Northeast Houston YMCA, the Lakewood Library and Hilliard Elementary School. All three remain closed at the time of this publication. Identifying other public buildings and facilities, such as schools, to serve as future disaster recovery sites will ensure a more coordinated relief effort in the future.

Ensuring that every neighborhood has the physical, social and economic resources to recover will lead to greater resiliency.



ABOVE: City of Houston Neighborhood Recovery Centers (NRC)
BELOW, Photos Left to Right: East Houston Civic Club Photos





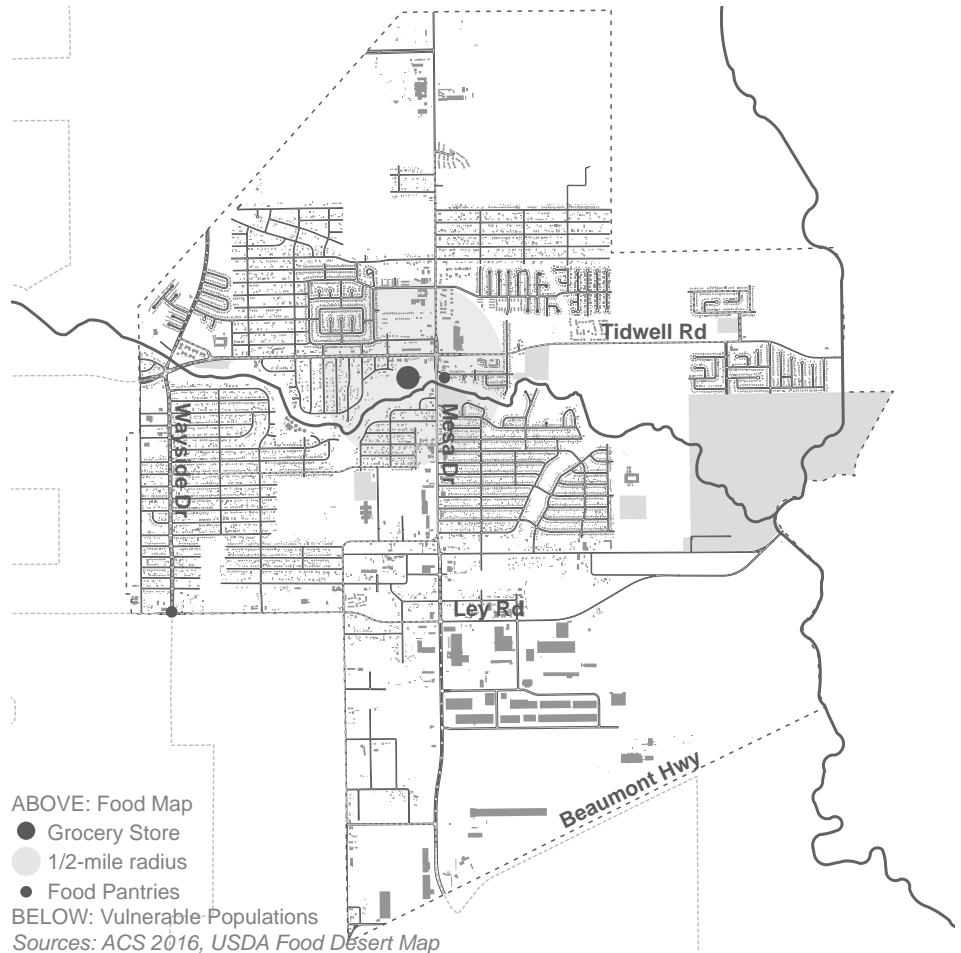
ABOVE: Map of Proposed Farms and Markets
 ■ Undeveloped Land
 ● Farm
 ● Market
 ● School
 ABOVE and LEFT: Proposed Market and Farm
 (Map, Concepts and Images by Caroline Smith, Kaihan Chen, Peter Eccles, Vilma Umanzor, Yan Lu)

Food Security

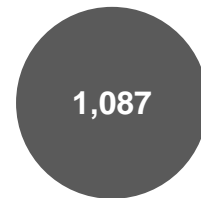
The East Houston Super Neighborhood has one major grocery store, Fiesta Mart located on the southwest corner of Mesa Drive and Tidwell Road. The grocery store flooded during Harvey and took several months to re-open. The next closest grocery store is more than four miles away. According to the USDA Food Desert Atlas three of East Houston's four Census tracts are defined as food deserts, where the tract is both low-income and has a high percentage of households without access to a vehicle. In these three tracts 543 households (12%) live more than a mile from a grocery store and do not own a vehicle.

There are two Houston Foodbank pantries in the neighborhood, one on Tidwell Road at Mesa Drive and the other at Wayside Drive and Ley Road. The closest community garden, supported by Urban Harvest, is at Fonwood Elementary School, outside the boundaries of the Super Neighborhood.

Developing strategies to ensure greater access to fresh and nutritious food across the neighborhood, as well as preventing food insecurity, will create greater resiliency. This strategy might include supporting a locally owned co-operative grocery store, developing urban farms or large community gardens, farmers markets, or increasing the number of food pantries across the neighborhood.



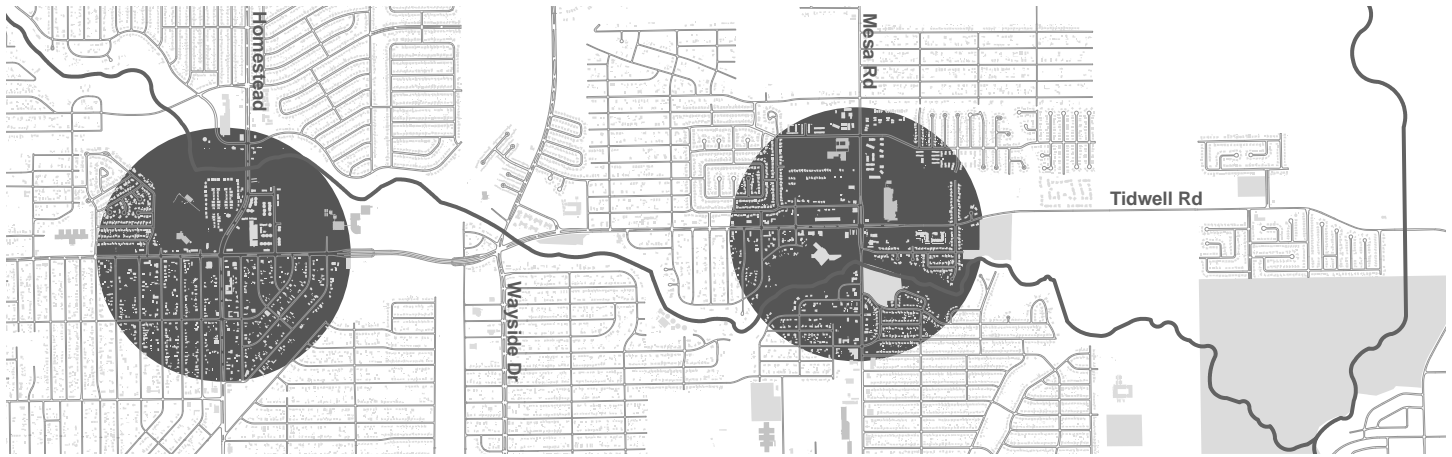
Children Living in Families with Incomes Below the Poverty Level



Families with Incomes Below the Poverty Level



Families With No Vehicle



Shopping, Schools,
Park, Community
Center

2.4 Miles

Mesa Transit Center,
Shopping, Groceries,
Schools, Park

ABOVE: Tidwell Road Detail Map
BELOW: Mesa Transit Center Photo
OPPOSITE PAGE, Top: Tidwell Bus Route
OPPOSITE PAGE, Bottom: Mesa Transit
Center Aerial
*(Photo Below by Caroline Smith, Kaihan Chen,
Peter Eccles, Vilma Umanzor, Yan Lu)*



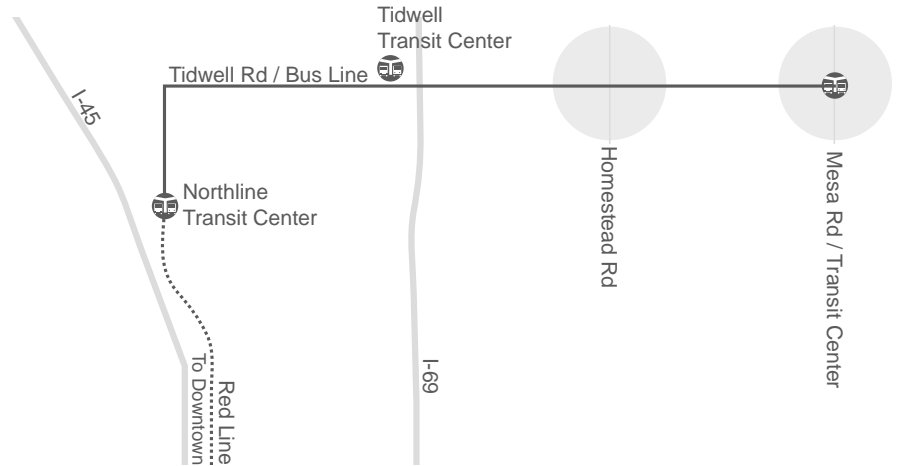
Transit Center Hub

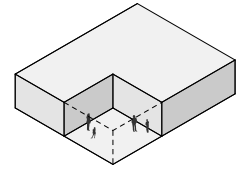
The Mesa Transit Center is ripe for intervention. Currently, the Transit Center is simply a series of bus shelters in a parking lot. Re-imagining this site with a more formal Transit Center, farmers market, small business incubators, or other social and community gathering places, could enhance the importance of this central site, a hub in the neighborhood.

All four of the area's bus routes pass through the Mesa Transit Center. The Tidwell bus route is the busiest, each day over 4,000 people board the Tidwell bus. The route connects to many local and city destinations including the Red Line light rail at Northline Commons.

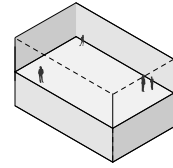
There are two primary local destinations along the Tidwell bus route. The first is the Mesa Transit Center which is adjacent to Fiesta Mart the only major grocery store in the neighborhood, area retail, restaurants, a pharmacy, Lake Forest Park, and four area schools. The second destination is at Tidwell Road and Homestead Road. The Northeast Multi-Service Center, Tidwell Park, a pharmacy, retail, restaurants, and a number of neighborhood schools are located near this stop.

The Halls Bayou Greenway, once complete, runs roughly parallel to Tidwell Road and will provide an alternative means of transportation between these two destinations.

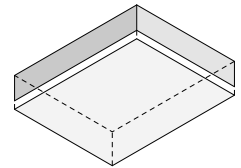




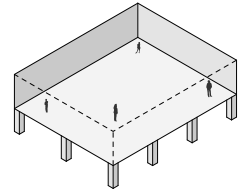
Living in garage of flooded home



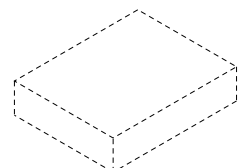
Living on the second story of flooded home



Repairing flooded home



Elevating flooded home



Flooded home buyouts

Flooded Home Recovery Strategies

LEFT: Planned Development (Plats)
 ABOVE: Strategies for Home Recovery
 OPPOSITE PAGE, Right: Conceptual Halls Bayou Section
 Sources: City of Houston Plat Tracker, Harrel Park photos by KPRC and San Antonio Express News
 (Home Recovery Strategies developed by Rocio Alonso, Canston Fitzwater, Shoab Nizami, John Taylor; Halls Bayou Section Concept by Caroline Smith, Kaihan Chen, Peter Eccles, Vilma Umanzor, Yan Lu)

Resilient Housing

The East Houston Super Neighborhood has 7,204 housing units, of these 2,281 are estimated to have flooded during Hurricane Harvey, or 32%. The Harrel Park neighborhood, a subdivision of 45 homes recently constructed by Habitat for Humanity flooded during Harvey. The organization is working with homeowners to help rebuild the homes.

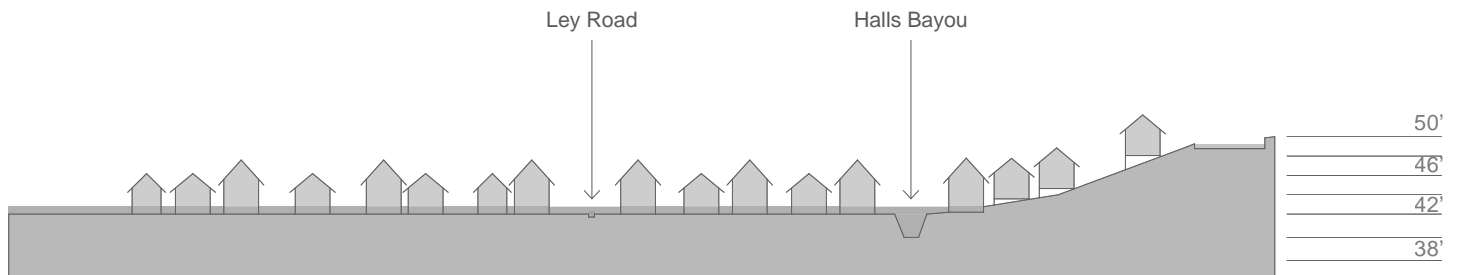
Even while the Halls Bayou watershed has experienced flooding on average every three and one-half years, new development continues to occur. Today, there are over a dozen new plats in the community.

To combat the risk of flooding, the City of Houston recently amended the flood plain ordinance, Chapter 19. The new code requires the elevation of structures in the 100- and 500-year floodplains to be elevated two feet above the 500-year flood elevation.

Developing resiliency strategies for new housing, including elevating, on-site rainwater collection and detention, and other mitigation strategies could work to ensure that future flood risks are minimized, and that no negative impacts are created through new construction. Ensuring greater resiliency of area housing will help to protect the wealth and stability of area families.



Harrel Park, a Houston Habitat for Humanity development, flooded during Harvey. The organization is assisting residents with rebuilding.





Participants and Sponsors

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*This document includes research prepared by students in Spring 2018

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We would like to send a special thanks to Amanda Burden and Lauren Racusin of Bloomberg Associates and to Juan Antonio Sorto for sharing his photographs of Harvey's impact on East Houston.



