25 HOUSTON ZIP CODES: A COMMUNITY LEVEL PUBLIC POLICY ANALYSIS

By Charity Productions 2021

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The rigor in a new age community measurement science.

Executive Summary

This analysis captures trends from specific areas of Houston, including two key influencers, *(1) city government is in business for itself, and (2) lack of job development is a specific area resulting in unstable resource pools and a substantial toxic disconnect with elected officials and stakeholders*. The prevailing jurisdictional edicts produce a steady diet of temporary fix initiatives. And declining public safety and health services.

Surveys conducted by Charity Productions over the past nineteen years with homeowners, renters, and local businesses, provided great insight from a bottom-up perspective.   These surveys become a part of the community institutional bank of knowledge on how gaps in service delivery consistently fails. The survey results overtime has revealed a fill in the blank puzzle of rotating priorities. Any four areas are laced with companion subset issues depending on the neighborhood.

We are at the dawn of a New Age to find the missing links reducing disparity's grip on underserved neighborhoods. This analysis uncovered a translation of service delivery DNA markers to an operational vehicle that reduces inequities. A change in the operational aspects will improve the change of the culture and climate of service delivery to underserved neighborhoods. Changing the trajectory of research from a bookshelf, of potential new research grants into a functional data transformation center of exchanges with sustainable field-tested program outlets.

In this new age will introduce new terms, redefine old terms and clarify mis-defined phrases. These proclamations will be accomplished by using an arrangement of proven and accepted practices starting with evidence-based approaches to problem solving and service delivery at the neighborhood level listed as hard to serve.

Part of the past.

Evidence - fully funded and staffed with good-intentioned outcomes with top scholars, NGOs, local jurisdictions, and private sector skilled personnel, yet disparity gaps continue to widen. What happened to the money and the solution building blocks for a sustainable set of programs intended to improve conditions instead of producing more gaps?

1. [Kerner Commission Report 1968](#) [Kerner Commission Report 2008](#)
2. [War on Drugs](#)
3. [War on Poverty](#)
4. [War on Poverty 50 years Later](#)
5. [Closing the Education Gap](#)
6. [Closing the achievement gap – news](#)
7. [What Works to Close the Education Gap](#)
8. [Housing Gap](#)
9. [Economic Gap](#)

Part of the Future

Yes, there are solutions with a better return on investment (ROI). For example, [FEMA](#). Mitigation projections covering twenty years of findings, every $1 spent - saves $4 in costs –

newer information projects savings are as high as $6, $7, and $13. [Ref. 1](#) and Ref. 2, [Data Highlight State-by-State Benefits of Federal Natural](#) This mitigation savings formula is supported by [FEMA's Mitigation Saves Fact Sheet](#), [National Institute of Builders Sciences](#), and more…

Introduction

Houston, we have entered a New Age, using scientific principles from the bottom up.

The fourth largest city in the United States, known for the world's largest medical center, its importance to the oil and gas industry, and its ethnic diversity is also home to 25 underserved zip codes where residents' needs for tax-based services are unmet. The fragmented municipal services provided to these areas historically means that, compared to (site the health department) other Houstonians, people in these neighborhoods live their lives experiencing poorer health, inadequate education, financial poverty, and lower levels of public safety. A fact that has been researched to death. The intended outcome of the research was/is to find solutions for improvements.   Municipal governments have identified disparities over many decades reflecting tax-based services deficiencies in the targeted 25 zip codes. Our analysis of disparities in these 25 zip codes confirms the existence non-connected research. Conversely, it also confirms the need for a better multiple layered interdisciplinary exchange platforms that reaches deeper into neighborhoods - labeled with unmet needs.

Our approach and strategies are based on scientific principles as a better means in reaching a more equitable service network, compared to a legacy of billions of dollars of funding and mega metric-tons of research papers that occupies too much shelf space.   We site decades of studies of the problem however, with under preforming results for black and poor people.

Charity Productions (CP) is a community-based organization (CBO) Service Outreach Provider based in Houston with a reputable background in serving the Houston community since 1984. CP has worked and consulted in research projects with local governments in Texas and across the nation, non-profit organizations, NGOs, public universities in public health, safety, housing, education, disaster preparedness, **and** civic engagement. Charity Productions outreach and messaging platforms include social media conferences, events, tabletop seminars, and workshops.

In, 1995 Charity Productions realized the added value of a university collaborative. About 1999 CP, convened a meeting with five university representatives: Houston Community College Central, University of Houston, University of Texas Health Science Center, Rice University, and Texas Southern University for the express purpose of working together to reduce disparities in neighborhoods in distressed areas.

Charity Productions has provided public health and safety messaging for various agencies, including the City of Houston Health and Police Departments, since the mid-eighties during the HIV threat, delinquent youth behavior (gang era). During the demand for cultural sensitivity training CP, was contracted to provide training for approximately nine thousand officers

throughout the nineties. CP was commissioned to provide outreach education for Obama Care campaigns and COVID 19 (pandemic) awareness messages by the COH Health Department. In the map below was a study indicated by the reddish hue marks the impacted contiguous landmass of disparities. Around 2012 or 2013, this 2010, the Statistically Significant Cluster study came to our attention. The map below was the inspiration for this analysis on other disparities.
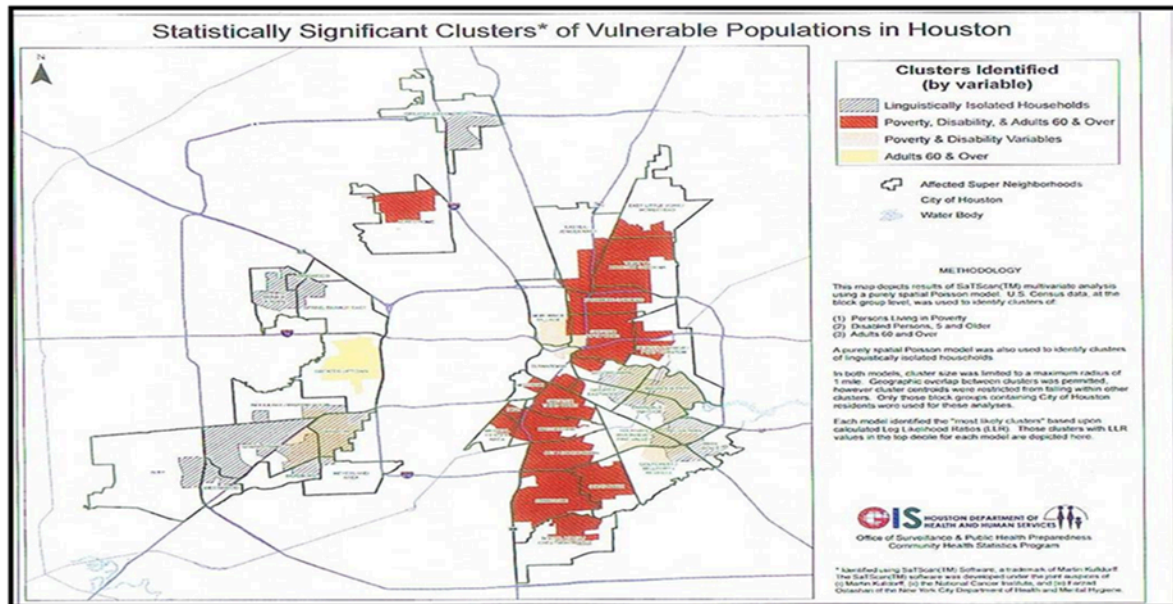
The City of Houston's Office of Surveillance and Public Health Preparedness (OSPH) describes communities with the constellation of disadvantages found in the Footprint as "socially vulnerable" and the Centers for Disease Control (CDC), characterizes similarly situated groups as "at-risk" populations[1] (see Figure 3).

Charity Productions is issuing this document as a pivot port of access to improve success ratios that encourage the process of reverse engineering decades-old problems into a better standard of care. This report aims to link agencies to untapped community capital highway and network to equity in service delivery. Assembling teams of satellite partnerships and partnering workforces that can be leveraged community capital and increase opportunities that will close service gaps and streamline service delivery into productive long-term sustainable outcomes.

This community-level analysis presents historical descriptions of conditions in these neighborhoods, quantitative data on outcomes of interest specific to the 25 zip codes, community assets and capital, and *Charity Productions' proposed interventions to remediate and mitigate these long-standing disparities.*

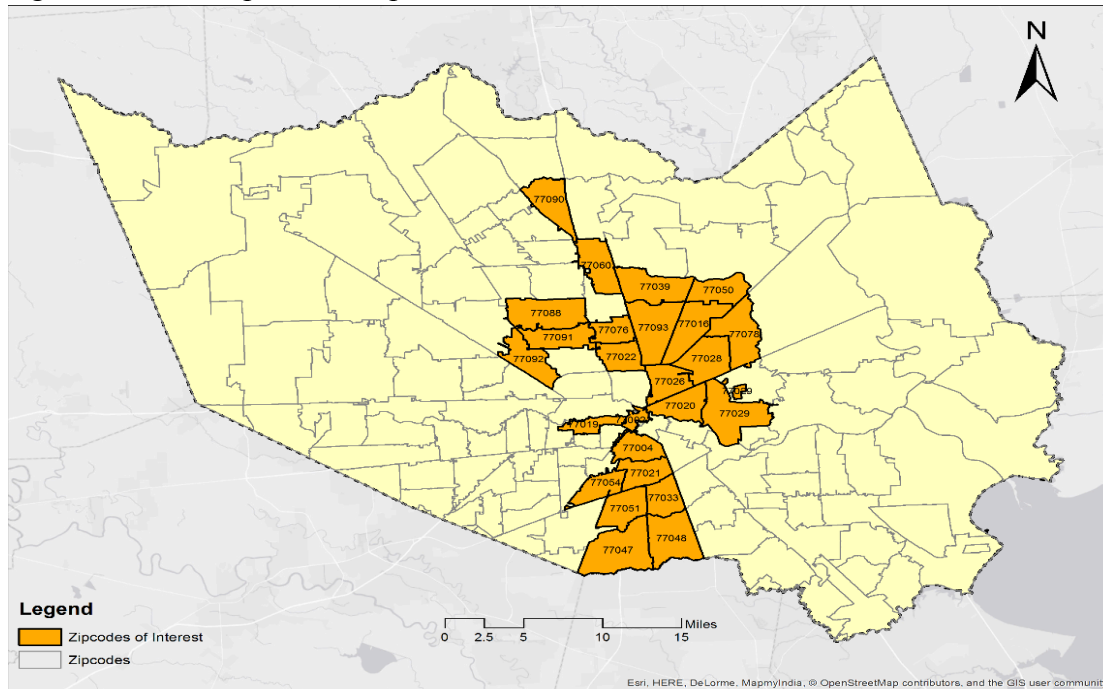[1] https://emergency.cdc.gov/workbook/pdf/ph_workbookfinal.pdf

Charity Productions[2] collected data about neighborhood conditions throughout Houston and identified patterns of historical neglect and exploitation that adversely affect residents' health, education, wealth, and safety in 25 zip codes. This geographic area is home to approximately 705,000 **people estimated living in the Footprint**. The boundaries of this area are defined by the outlines of 25 adjoining zip codes which we call "the Footprint" (see Table 1).

Zones of Vulnerabilities

Table 1. The Footprint: 25 Low Service Zip Codes in Houston

Zip Codes of Interest in Harris County				
77002	77021	77033	77051	77088
77004	77022	77039	77054	77090
77016	77026	77047	77060	77091
77019	77028	77048	77076	77092
77020	77029	77050	77078	77093

Figure 3. The Footprint: 25 Zip Codes of Interest

The Dynamics of Zip Code Multiple Threat Assessments

Residents of the Footprint live in neighborhoods plagued by a common set of health and healthcare, education, income, and public safety deficits. Below we present findings and recommendations from research conducted (between 2002 and 2018) in the Footprint. Data was collected at, focus meetings, town halls and Community Partnership Exchange Breakfasts.

The City of Houston's Department of Health and Human Services and the Office of Surveillance and Public Health investigated health disparities in the Footprint from 1999 to 2003, through a series of health profile studies. These studies identified health conditions of Footprint residents and the underlying contributory factors. The most prevalent health conditions researchers identified among Footprint residents with high rates of mortality, teen pregnancy (and related high infant mortality rates), hospitalization due to violent crime, sexually transmitted diseases, and illnesses related to environmental hazards.

The City of Houston's health profiles labeled Footprint mortality rates as "premature." Meaning that large numbers of residents died before reaching their 75th birthday. The years of potential life lost due to high "premature" death rates in the Footprint represents losses of lives[3].

From December 2011 through September 2012, the Texas Area Health Education Centers (AHEC) in the East Greater Houston Region conducted the Health Information Needs Assessment.[46] The Health Information Needs Assessment (a 10-question survey) investigated the connection between residents' health conditions and healthcare accessibility. The needs assessment gathered information from Footprint residents about their primary health concerns and barriers that prevented them from getting healthcare services and information.

The Health Information Needs-Assessment results identified gaps in healthcare caused by lack of quality neighborhood healthcare services, access to computers (as well as the skills to use computers to search for information about nutrition, healthcare, and disease prevention), and accurate and up to date healthcare information. Many residents responding to the survey indicated that increasing access to health information would significantly improve both the quality of their lives and public health.

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[3] Community Health Profiles 1999-2003 Sunnyside Super Neighborhood

[46] Sunnyside Update Health Information Needs Assessment- Conducted by Texas AHEC East Greater Houston Area

In addition, the Health Information Needs-Assessment project identified the following threats to residents' well-being: ***The Predatory Cycle Syndrome – Communities under stress***

- Convenience stores and fast-food restaurants outnumber options for fresh and healthy foods
- Poor-quality infrastructure and housing stock
- Abandoned and dilapidated buildings pollute the environment
- High rates of burglary and aggravated assault
- Cost of public transportation
- High drop-out rates in secondary schools
- High-unemployment levels

- Lack of fresh and healthy foods in neighborhoods contribute to residents' poor health
- Trash littering the streets
- High levels of illegal drug use
- Inaccessible public transportation
- Low-performing secondary schools
- Low levels of educational attainment among residents
- High-poverty levels

Recommendations from the Texas AHEC East's Health Information Needs Assessment project included:
- Appealing to different demographic groups using well-designed marketing campaigns focusing on health services, health education, and computer proficiency programs
- Partnering with area churches, local health care providers, and community organizations to host meetings and disseminate health information
- Pooling resources and raising funds with residents and other community stakeholders to implement educational programs for adults and increase community capacity to disseminate health information
- Identifying health services for residents with HIV, heart disease, and diabetes

In 2012, the Houston Grocery Access Task Force investigated the link between obesity and the lack of healthy, fresh, and affordable food in Houston's low-income areas. They concluded that Houston had fewer grocery stores per capita than most major cities.[5] The task force recommended opening more grocery stores in food deserts like the Footprint; providing government incentives to reduce construction costs; financing low-interest loans to promote grocery store development; and improving public transit to ensure accessibility to grocery stores. In addition, the task force noted that grocery stores would contribute to economic development in the Footprint by adding new jobs.

In 2013, the University of Houston developed the Healthy Community Design Strategy[6] which focused increasing access to healthy foods, encouraging stable neighborhoods, and providing affordable housing and economic opportunity. The data collected provided evidence of poverty in many Houston communities.

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[5] Houston Grocery Access Task Force 2012.

[6] Healthy Community Design Strategy 2013.

Public administrators' actions regarding these and other research findings and recommendations for addressing Footprint residents' needs suggest four possible conclusions:

(1) agencies and government officials documented and know about the problems

(2) agencies and government officials do not have sustainable universal solutions that engage, capacity building blocks, and reduce the inequities of the past

(3) residents need a universal model to develop community-based solutions

(4) accepted predatory practices

Quantitative Data on Outcomes of Interest Specific to The Footprint

In this section, we present maps that highlight the demographic characteristics of people living in the Footprint. Data presented in this section are from the CDC's Social Vulnerability Index ratings (that is, measures of socioeconomic status, household composition & disability, minority status and limited English language proficiency, and housing type and transportation), the Child Opportunity Index ratings, the Houston Independent School District, and the Houston Police Department.

The Footprint's Social Vulnerability Index Ratings

Developed by the CDC, the Social Vulnerability Index (SVI) measures "the relative vulnerability of every U.S. Census tract." Social vulnerability is defined as "the potential negative effects on communities caused by external stresses on human health." These stresses may be "natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss."[7]

The SVI ranks each Census "tract on 15 social factors, including unemployment, minority status, and disability, and further groups them into four related themes"—Socioeconomic Status, Household Composition and Disability, Minority Status and Language, and Housing Type and Transportation. Each tract "receives a ranking for each Census variable and for each of the four themes, as well as an overall ranking."[8] Table 2 presents the Social Vulnerability Index themes and variables.

Table 2. Social Vulnerability Index: 4 Themes and 15 Variables

Socioeconomic Status	Household Composition & Disability
o Below Poverty	o Aged 65 or Older
o Unemployed	o Aged 17 or Younger
o Income	o Civilian with a Disability
o No High School Diploma	o Single-Parent Households
Minority Status & Language	**Housing Type & Transportation**
o Minority	o Multi-Unit Structures
o Aged 5 or Older who Speaks English "Less than Well"	o Mobile Homes
	o Crowding
	o No Vehicle
	o Group Quarters

Figure 4 presents the social vulnerability index ranking of each zip code in the Footprint.

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[7] https://www.atsdr.cdc.gov/placeandhealth/svi/index.html

[8] https://www.atsdr.cdc.gov/placeandhealth/svi/documentation/SVI_documentation_2018.html

Figure 4. The Footprint: 25 Low Service Zip Codes Social Vulnerability Index Ranking
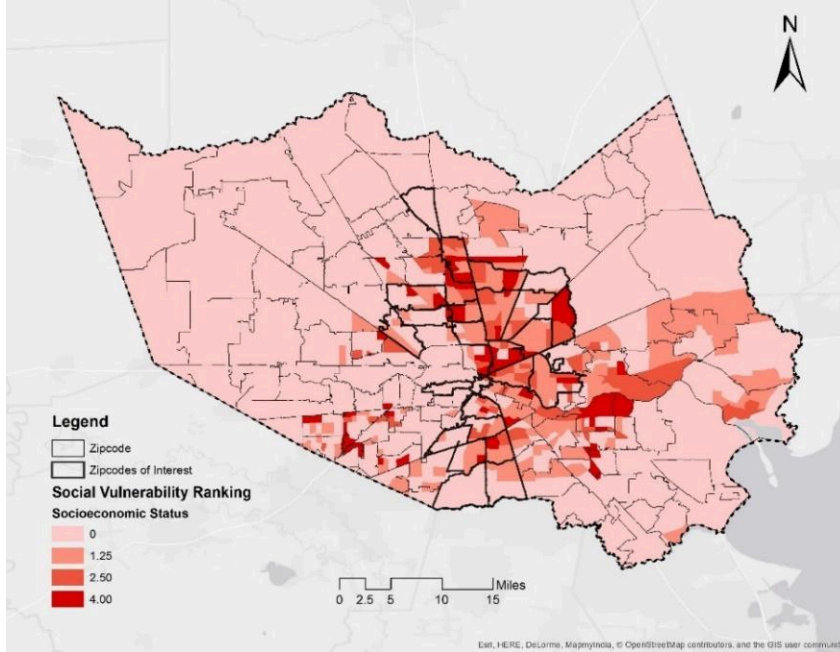
Figure 5 presents the percent of white non-Hispanic residents living in the Footprint. The dark brown areas indicate that no more than 10 percent of Footprint residents were white non-Hispanic.

Figure 5. The Footprint: Percent of Non-Hispanic White Residents
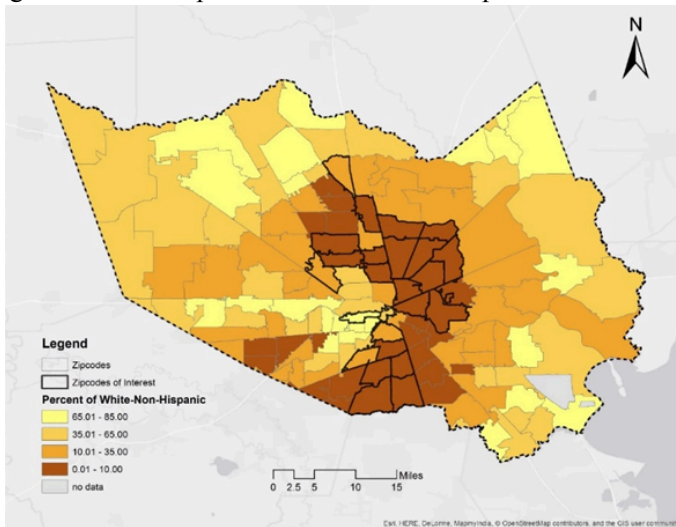
Figure 6 presents median household income data in each zip code (by thousand dollars). The lowest median household incomes ranging from $21,000 to $40,000 are in the darkest red areas, inside the Footprint. Outside of the Footprint the median income ranges from $50,000 to $164,000. This income gap between the two areas underscores these disparities.

Figure 6 The Footprint: Median Household Income
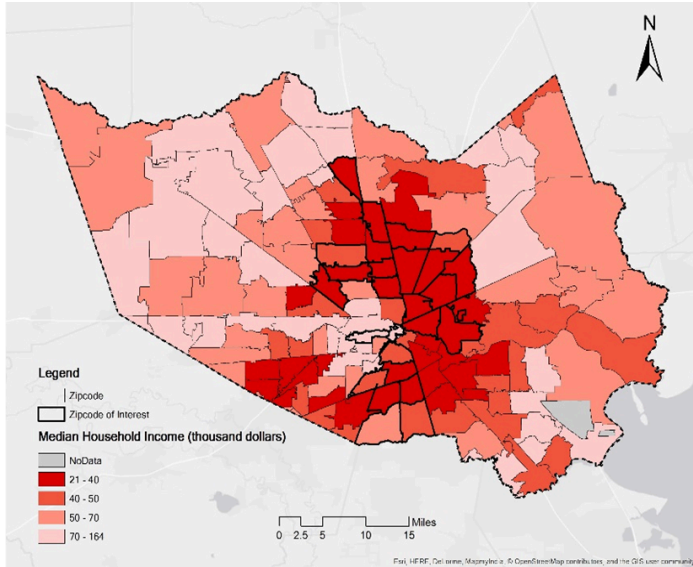
Figure 7 presents the percentage of Houston's population living below the poverty line. X of the 25 zip codes are home to areas in which 30 to 44 percent of residents live below the poverty level.

Figure 7. The Footprint: Percent of Residents Living below the Poverty Level
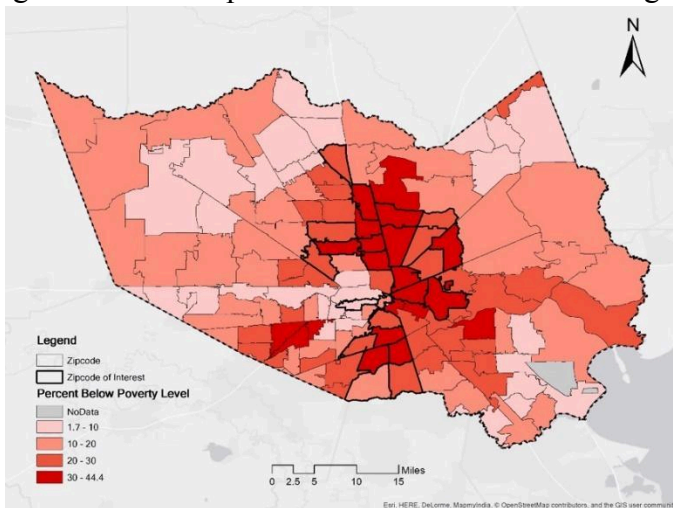
Figure 8 presents the percentage of residents with disabilities living in the Footprint. High concentrations of disabled residents living within the Footprint repeats the pattern of disadvantage previously noted about the poverty level, COI, and food deserts. Of the 25 Zip codes in the Footprint, 9.6 to 11.5 percent of residents in 3 (or 12 percent) zip codes live with disabilities and 11.6 to 22 percent of residents in 15 (60 percent) zip codes live with disabilities. Outside of the Footprint, 9 percent or fewer Houston residents live with disabilities.

Figure 8. The Footprint: Percent of Residents Living with Disabilities
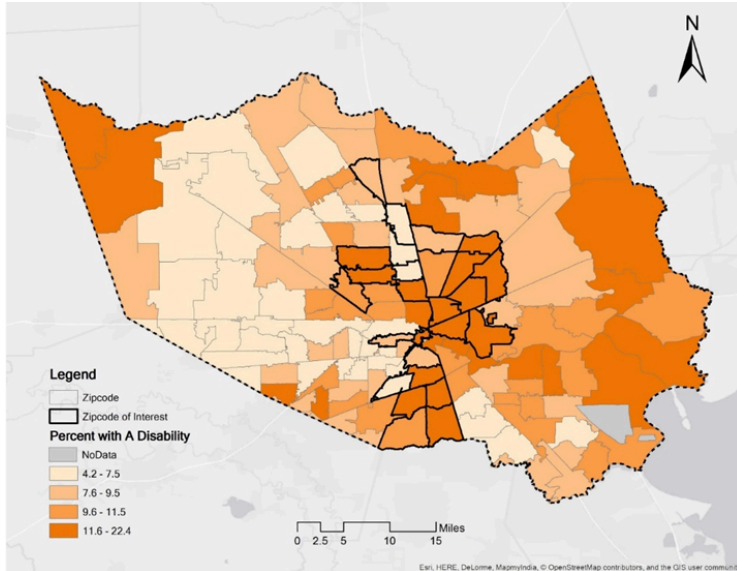
Residents of the Footprint tend to be people of color, living with disabilities, poor, living without transportation, and linguistically isolated.

Child Opportunity Index

Figure 5 presents results of the Child Opportunity Index (COI)[9] for each of the 25 Houston zip codes (COI measures at the Census Tract level—were data for zip codes aggregated by Census Tract?). The COI developed at Ohio State University measures and maps 29 neighborhood indicators to define three domains that help children living in metropolitan areas thrive. The domains are—
1. Education—access to high quality early childhood, elementary, and secondary education and resources that promote high educational achievement
2. Health and Environment—availability of fresh and nutritious food, proximity to toxic waste sites, and exposure to extreme heat
3. Social and Economic presence of neighborhood employment and economic resources

The COI scores for the 25 zip codes in the Footprint are highlighted on the map (see Figure 5). COI scores for 15 of the 25 zip codes indicate that these are "very low" to "moderate" opportunity areas for children to thrive. Underscoring that those children living in the Footprint lack the education, health and environment, and social and economic resources available to taxpayers in other areas of Houston.

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[9] http://www.diversitydatakids.org/files/CHILDOI/DOCS/DDK_KIRWAN_CHILDOI_%20OVERVIEW.pdf

Figure 5. The Footprint: Child Opportunity Index Map

Child Opportunity Index Map
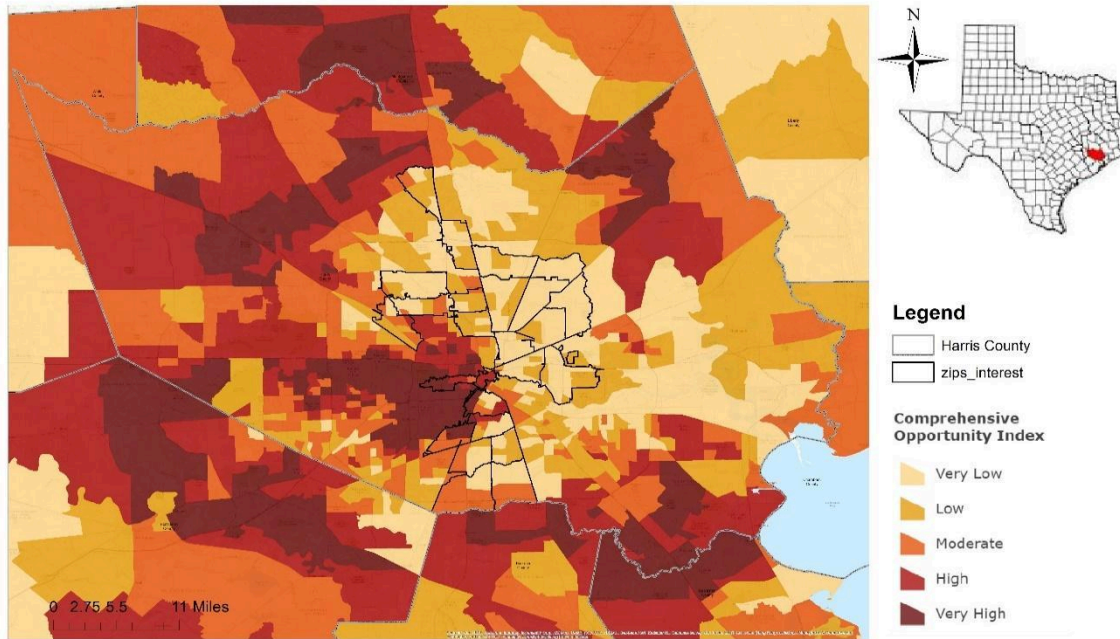
Houston Independent School District

The map below (see Figure 9) presents the number of elementary, middle, and high school the Houston Independent School District (HISD) closed inside the Footprint from 2001 through 2014. HISD's school closures resulted from local government underfunding public schools (Reference ?) and limited the ability of students to receive quality educations close to their homes.

The yellow dots in Figure 9 represent locations of closed HISD schools. Red areas identify the zip codes with three to seven school closings since 2001. Blue indicates an area with no schools' closures during the same time period. The school closures appear to cluster in the central and northeastern sections of Houston. Of the 25 zip codes, some 30 schools were closed since 2001, according to HISD information.

Figure 9. The Footprint: Number of HISD School Closures Since 2001
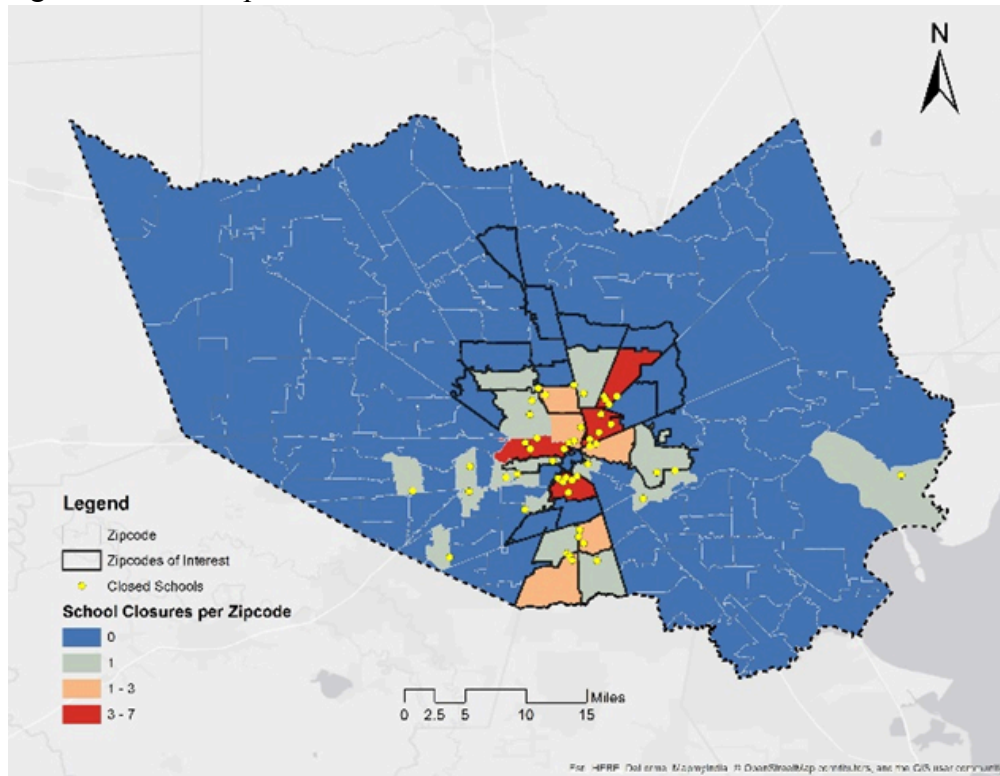
Houston ISD used [Board Policy CT2](#) [10] to selectively close more schools in predominately black neighborhoods (Reference ?). The policy focused on schools with low standardized test scores (defined as low performing) and low student attendance rates. HISD administrators manufactured both conditions—low standardized test scores and low attendance rates—using school board policies to remove high quality education programs and qualified educators from schools.

Ultimately, school closures undermine the sense of community in neighborhoods and contribute to their degradation (Reference?). HISD's school closures disproportionately affected low-income students in the Footprint. School closures hurt communities in forcing students to attend school with even lower attendance rates and poorer school performance (Reference?). Closing schools in the Footprint created education deserts in these neighborhoods because students were deprived of education opportunities close to home. In addition, these school closures burdened students and families by requiring that they spend more time and incur higher transportation costs to attend schools farther away from home.[11]

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[10] http://pol.tasb.org/Policy/Code/592?filter=CT2

[11] https://www.washingtonpost.com/news/answer-sheet/wp/2013/03/06/how-closing-schools-hurts-neighborhoods/?utm_term=.83a841791ac8

Houston Police Department

Figure 10 presents the per capita Violent Crime rate in Harris County. Within the Footprint, areas with high violent crime rates located in Northern Harris County and lower violent crime rates were in Southern Harris County. The pattern presented in Figure 10 repeats the previously noted pattern of concentrated disparities in the Footprint. Unemployment rates are significantly more concentrated among vulnerable populations and are positively correlated with high crime rates in these areas.[12]

Figure 10. The Footprint: Violent Crime Per Capita
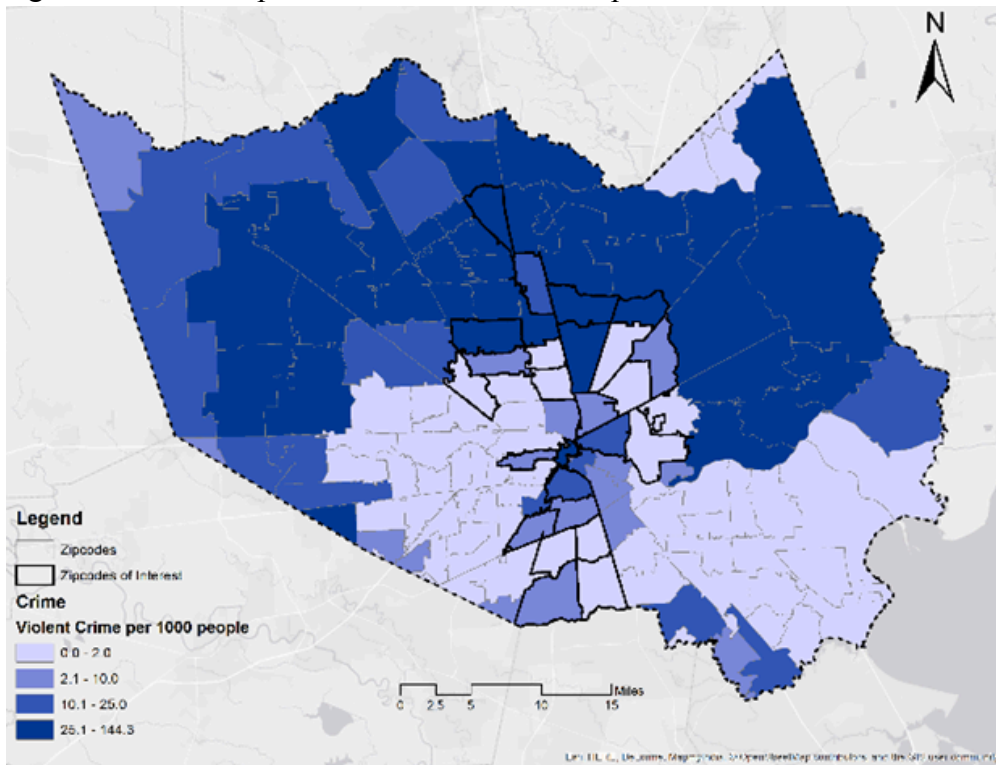
[12] http://researchnews.osu.edu/archive/crimwage.htm?ct=t(Mayor_Sylvester_Turner_and_Vulnerable_Po10_30_2016)

Community Assets, Investment, Value, Added Value and Social Capital

The previous data defined a set of disparities and indicators common across neighborhoods in the Footprint. These distinguishable and persistent disparities signal systemic problems that require effective long-term systemic solutions. As part of the essential elements needed when making systemic changes includes new terms used to define the problem or solution; therefore, we must change the negative language to positive. The black community has been defined with negative descriptive language since 1555, in America and Houston. **The Neuroscience Behind Our Words - BRM Institute** https://brm.institute/neuroscience-behind-words

Although neighborhoods in the Footprint may be viewed as burdens or problems to solve, these communities possess assets and resources that can be harnessed to address disparities and create solutions that will directly serve the needs of residents.

The 2012 AHEC East Greater Houston Region's Health Information Needs Assessment identified community the following assets in the Footprint:
- Neighborhood churches - Multi-Service Centers - City and county health centers

Note: The readers should consider questions:
1. After sixty-years why hasn't the scale of disparity's trajectory changed in the black community?
2. How is it that municipal government is able to continue to receive funding to fix a problem that they have demonstrated an inability to fix?

Homeowners and long-time residents of the Footprint are vetted and vested neighborhood assets, due to their social, physical, and hard currency contributions. Unlike the everchanging administrators of government agencies, homeowners in the Footprint are committed to their neighborhoods. As community assets they are central to creating viable solutions to neighborhood conditions that threaten their health, safety, and well-being. Instead of using a Predatory Research style.

As residents of the Footprint, they are concerned about the physical conditions and social behavior issues in their neighborhoods. They are active in Charity Productions' civic engagement groups and meetings.

During our community meetings we collect information from Footprint residents about their neighborhood concerns and needs. Residents identified three neighborhood concerns and needs (see Figure 11)—
1. Infrastructure—Repair streets, drainage ditches, streetlights, and sidewalks
2. Sanitation and Maintenance—Pick up excessive trash and clear illegal dumping sites, drainage ditches, and weeds from vacant lots
3. Security—Increase police performance in neighborhoods to eliminate all forms of crime.
4. Other points of concern were listed on different surveys.

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Our Proposition: Remediate and Mitigate Current and Future Disparities

Reverse Engineering and Retooling Equities – The DNA Process
There are seven core DNA including guiding principles that include lessons learned:
: [Community Based Participatory Research](#), [Anchor Institutions](#), [Evidence-Based Research Practice](#), [National Incident Management System,](#) [Bottom up to top down](#), [Advocacy](#) and [Public Policy](#).   Each main group has multiple subset and links to other proven practices.
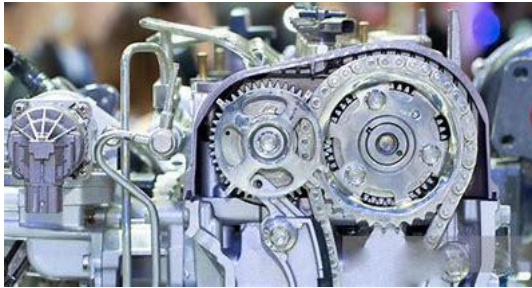
Presidential Policy Directive/PPD-8: National Preparedness
We propose using a community initiated, longitudinal, bottom-up approach to solving the previously identified and foreseeable climate change related problems. Existing assets in the Footprint combined with services available in and out of the Footprint are central to implementing neighborhood improvement projects that reduce disparities. Presidential Policy Directive/PPD-8 on national preparedness is a gateway for people living in the Footprint to learn about and influence the decision-making process regarding interventions designed to prevent, protect against, mitigate, respond to, and recover from natural and man-made disasters, which affect their neighborhoods.

Originally issued in 2003, [13] and revised in 2011, Presidential Policy Directive/PPD-8: National Preparedness provides the rationale and framework for creating and funding solutions for vulnerable residents of the Footprint. PPD-8 states:

> *"This directive is aimed at strengthening the security and resilience of the United States through systematic preparation for the threats that pose the greatest risk to the security of the Nation, including acts of terrorism, cyber-attacks, pandemics, and catastrophic natural disasters. Our national preparedness is the shared responsibility of all levels of government, the private and nonprofit sectors, and individual citizens. Everyone can contribute to safeguarding the Nation from harm. As such, while this directive is intended to galvanize action by the Federal Government, it is also aimed at facilitating an integrated, all-of-Nation, capabilities-based approach to preparedness…"[14]*

In mid 2000s, former Department of Homeland Security Secretary Tom Ridge stated that:

> "Uniformed emergency responders constitute less than one percent (1%) of the total U.S. population, **citizens must be better prepared, trained, and practiced on how to best take**

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[13] Presidential Policy Directive PPD-8, https://www.dhs.gov/presidential-policy-directive-8-national-preparedness

[14] https://www.dhs.gov/xlibrary/assets/presidential-policy-directive-8-national-preparedness.pdf

care of themselves and assist others in those first, crucial hours during and after catastrophic incidents through preparedness measures and actively contribute to the Nations response capability by participating in response and recovery activities. A trained and involved public will provide the Nation with a crucial surge to augment government efforts in a catastrophic incident."

The goal of PPD-8 is establishing and sustaining core capabilities that foster the development and sustainability of complete and resilient communities and in the process transform neighborhoods prone to natural disasters into neighborhoods that are both sustainable and resilient to disasters. And the federal government allocated resources and tools to develop the defined core capabilities.

Updated Mapping All Hands on Deck

When reading this document online each zip code by double clicking the numbers, you will be transferred to one of several zip code demographics, we selected Neighborhood Link as our baseline source.
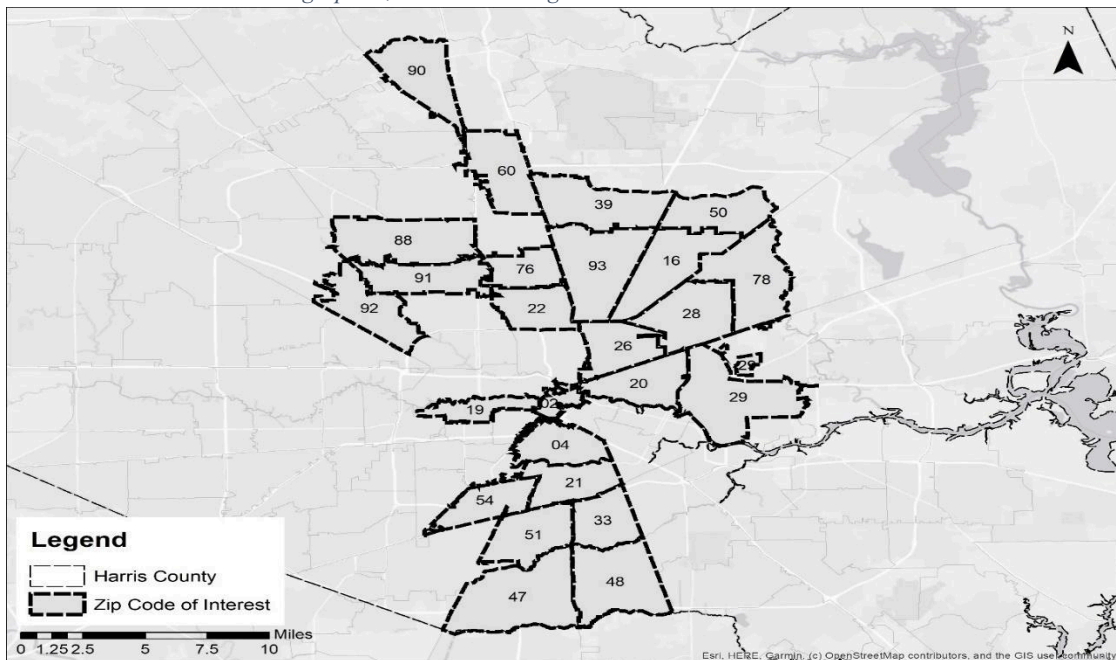
Figure 9 Zip Code of Interest

Social Vulnerability Index

There are social and economic patterns that separate communities from least to most vulnerable before a disaster strikes. Once a disaster strikes, the impact can impose risk on vulnerable communities. The Social Vulnerability Index (SVI) dataset was created by the Center for Disease Control (CDC) to help emergency response, planners, and public health officials map communities that will most likely need support before, during, and after a hazardous event. [1] Social vulnerability is "the characteristic of a person or group in terms of their capacity to anticipate, cope with, resist and recover from the impacts of a natural hazard." [2] To

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determine the social vulnerability of a location, the CDC uses U.S. Census data to determine vulnerability at the Census Tract level. Census Tracts are subdivisions of counties, which census collects statistical data. [3] Census tract level is commonly used to analyze data for policy and planning in government and public health. [4] The CDC's SVI uses 15 variables that may weaken a community's ability to cope with a disaster. The 15 factors are divided into four themes: socioeconomic status, household composition, race/ethnicity/language, and housing/transportation. Each analysis gives each theme a different vulnerability ranking. An overall ranking sums up the themes to create an overall vulnerability rank, which ranks low to high.

[1] CDC/ATSDR SVI Fact Sheet | Place and Health | ATSDR
[2] Blaikie et al., 2014
[3] Glossary (census.gov)
[4] Krieger, N. 2006. A Century of Census Tracts: Health & Body Politic (1906– 2006). Journal of Urban Health 83(3):355–36

In this section, the SVI's four themes and overall data was mapped in correspondence to the 25 zip codes. The CDC's latest data is from 2018. Though it is not the most updated data from the U.S. census, it is the most updated data using the CDC's calculations. The maps were created using the ArcMap 10.7 version.

Theme #1 Socioeconomic Theme

Theme #1 uses population below poverty, unemployment, income, and lack of high school diploma to determine vulnerability. Populations that receive low-income wages are less likely to have assets to prepare or recover after a disaster. [1] The relationships between education and vulnerability are associated with both income and poverty. [2] Less-educated people are less likely to have access to hazards preparedness information and cope with recovery. As seen in figure 2, census tracts within northeast zips have a high rank in socioeconomic vulnerability. Easy access to educational workshops is likely to reduce vulnerability in high-ranked areas. Communities will be able to understand their various preparation and recovery options.

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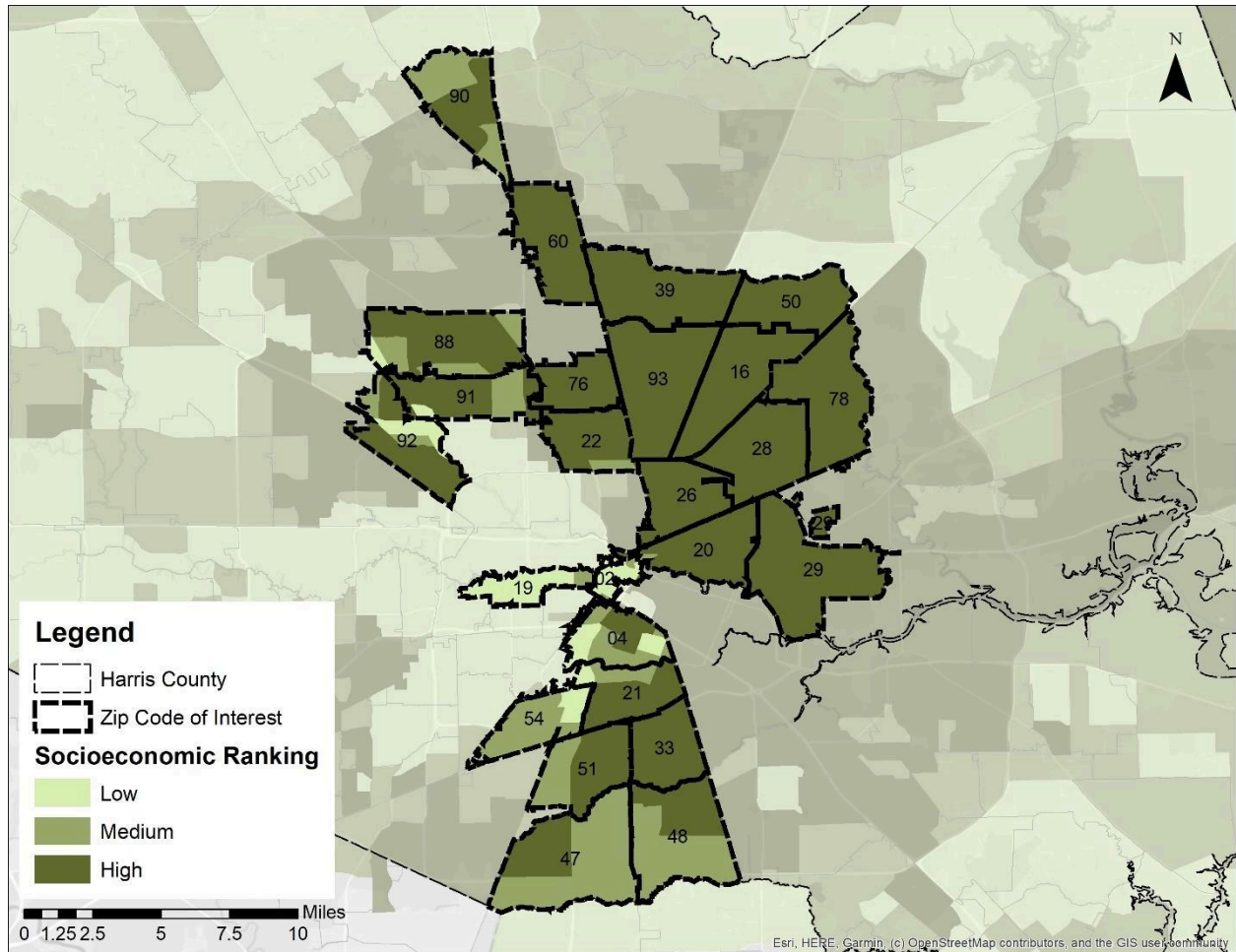
Figure 10 Socioeconomic Vulnerability Ranking

[1] Morrow, B.H. 1999. Identifying and Mapping Community Vulnerability. Disasters 23(1)1–18.

[2] Flanagan, B. E., Gregory, E. W., Hallisey, E. J., Heitgerd, J. L., & Lewis, B. (2011). A social vulnerability index for disaster management. *Journal of homeland security and emergency management*, *8*(1).

Theme #2 Household Composition/Disability

Theme #2 uses population aged 65 and older, aged 17 or younger, older than 5 with a disability, and single-parent households variables to determine vulnerability. This theme focuses on people who are likelier to require are co-dependent on external financial support, transportation, medical care, and additional assistance with ordinary activities. Children lack the necessary knowledge

and life experience to protect themselves during a disaster. Older adults often need to require the assistance of others. As children, they are more likely to be dependent on others.

Similarly, single-parent households are usually in lower economic status. They are vulnerable because all responsibility falls to one parent. [1]. Figure 3 displays that zip does 77050, 77015, 77028, and 77078 are the most vulnerable in theme 2. In the most vulnerable areas, emergency responders must be prepared for child-care and elderly and disabled assistance.

[1] Flanagan, B. E., Gregory, E. W., Hallisey, E. J., Heitgerd, J. L., & Lewis, B. (2011). A social vulnerability index for disaster management. *Journal of homeland security and emergency management*, *8*(1).
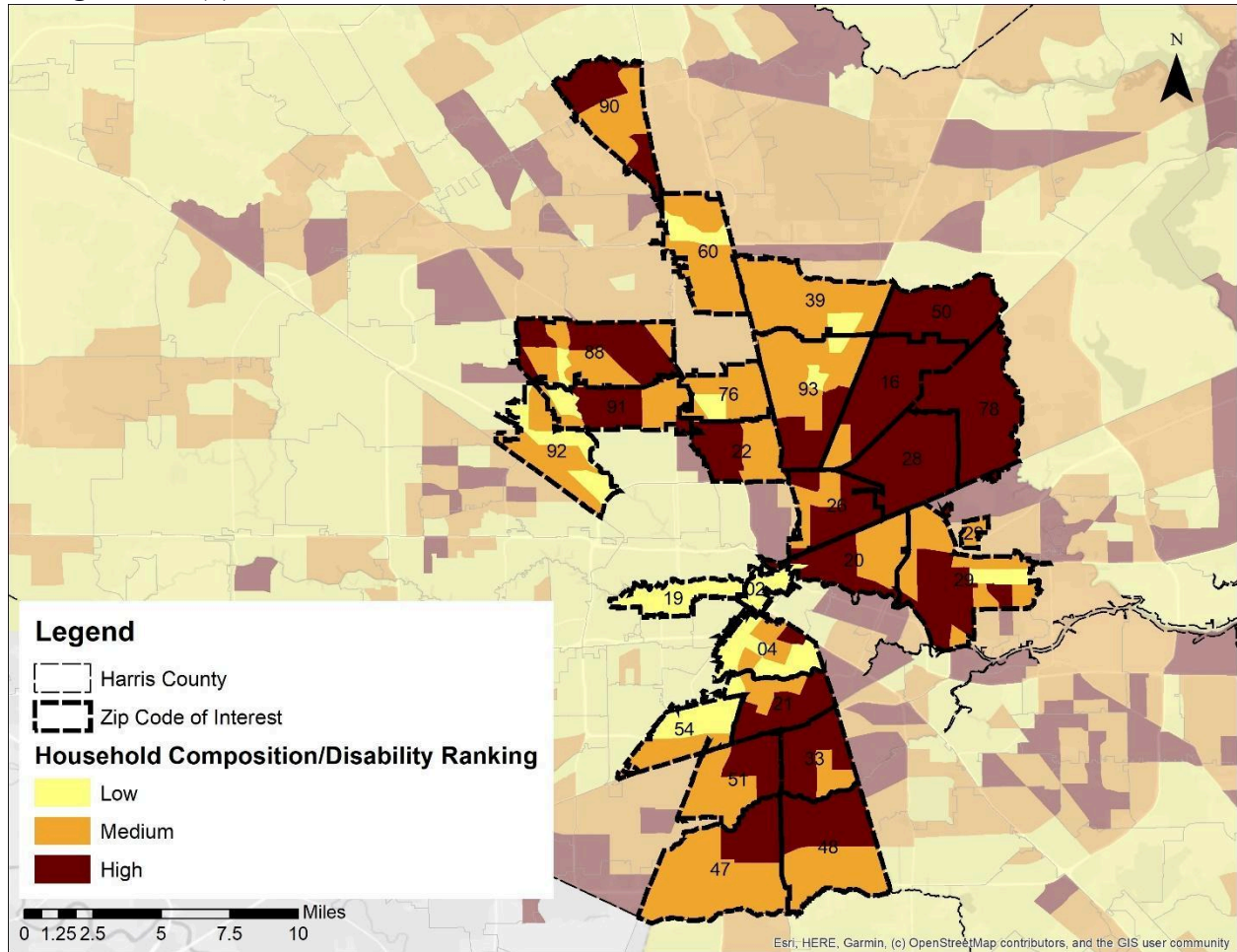
Figure 11 Household Composition and Disability Vulnerability Ranking

Theme #3 Minority Status/Language

Theme #3 uses minority (non-white individuals) populations and individuals who speak English "less than well" to determine vulnerability. Historically, racial minorities and people who speak different languages are the most vulnerable during disasters and have difficulty recovering due to racial discrimination and segregation. Marginalization of minority populations could be due to real estate discriminatory practices, which have made this community vulnerable during all stages of disasters. [1]. The limitation to understanding English makes disaster communication increasingly difficult. While English is not the United States' official language, it is the language

most used to communicate. As language barriers continue to become an issue for non-English speakers, they must rely on a social network for updates or information on disasters. [2]. As seen in figure 4, most zip codes have a high rank for theme 3.

 [1] Cutter, S. L., Boruff, B. J., & Shirley, W. L. (2003). Social vulnerability to environmental hazards. Social science quarterly, 84(2), 242-261.
[2] Flanagan, B. E., Gregory, E. W., Hallisey, E. J., Heitgerd, J. L., & Lewis, B. (2011). A social vulnerability index for disaster management. *Journal of homeland security and emergency management*, *8*(1).
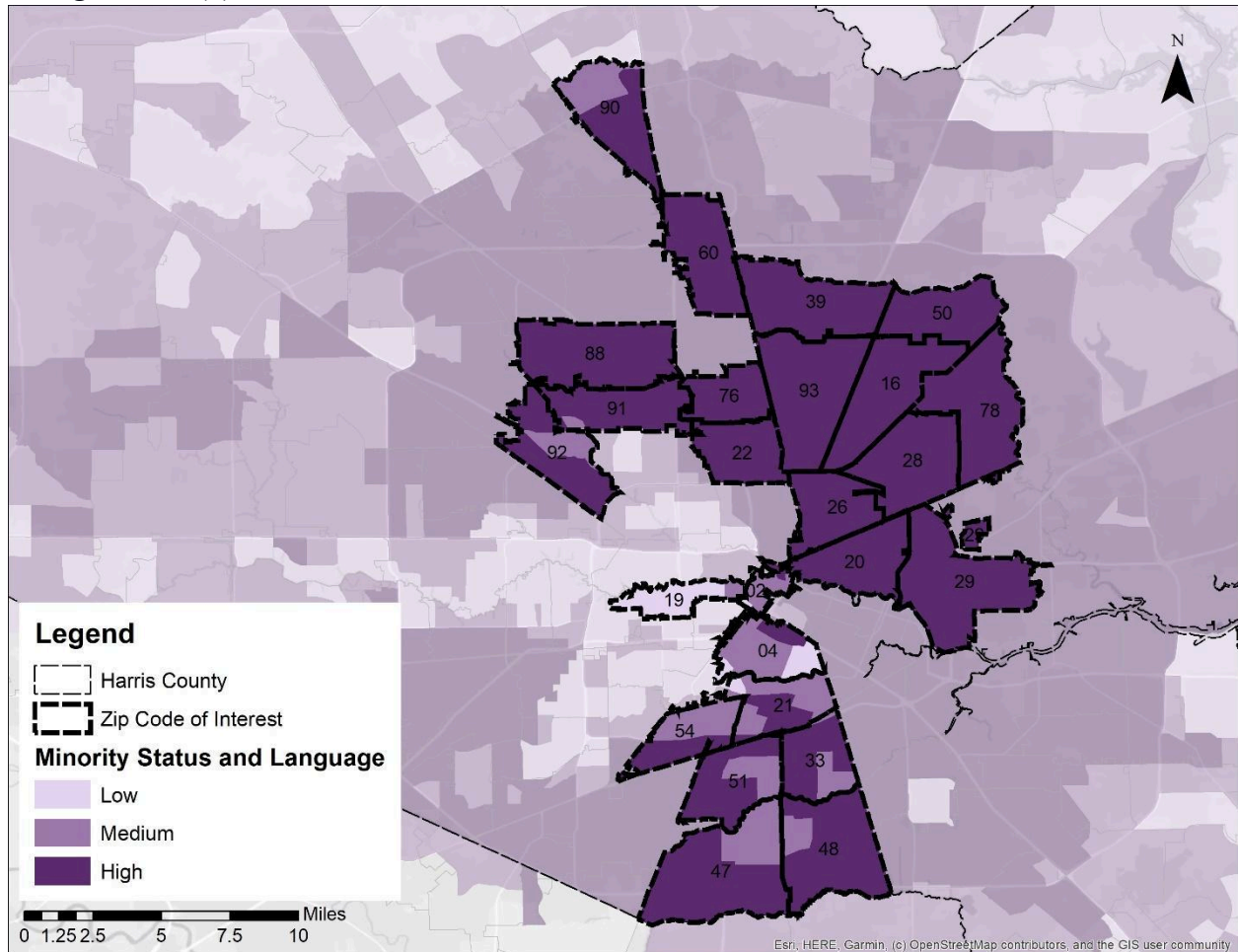
Figure 12 Minority Status and Language Vulnerability Ranking

Theme #4 Housing Type/Language

Theme #4 uses multi-unit structures, mobile homes, crowded housing, populations without vehicles, and populations in group quarters to determine vulnerability. Housing quality is personally tied to income and vulnerability because low-income individuals often live in poorly constructed homes or mobile homes. [1]. These homes are often found in clusters. They are not equipped to withstand heavy flooding or storms. In urban populations, most people live in clusters, which makes it difficult for evacuation purposes. Additionally, the lower vehicle usage

in urban areas makes it increasingly difficult for people to evacuate hazardous zones. Figure 5 displays that the highest vulnerability communities are in 77078. However, there are large pockets of vulnerabilities tracts in all zip codes.

[1] Eidson, M.; J.A. Lybarger; J.E. Parsons; J.N. MacCormack; J.I. Freeman. 1990. Risk Factors for Tornado Injuries. International Journal of Epidemiology 19(4):1051–1056.
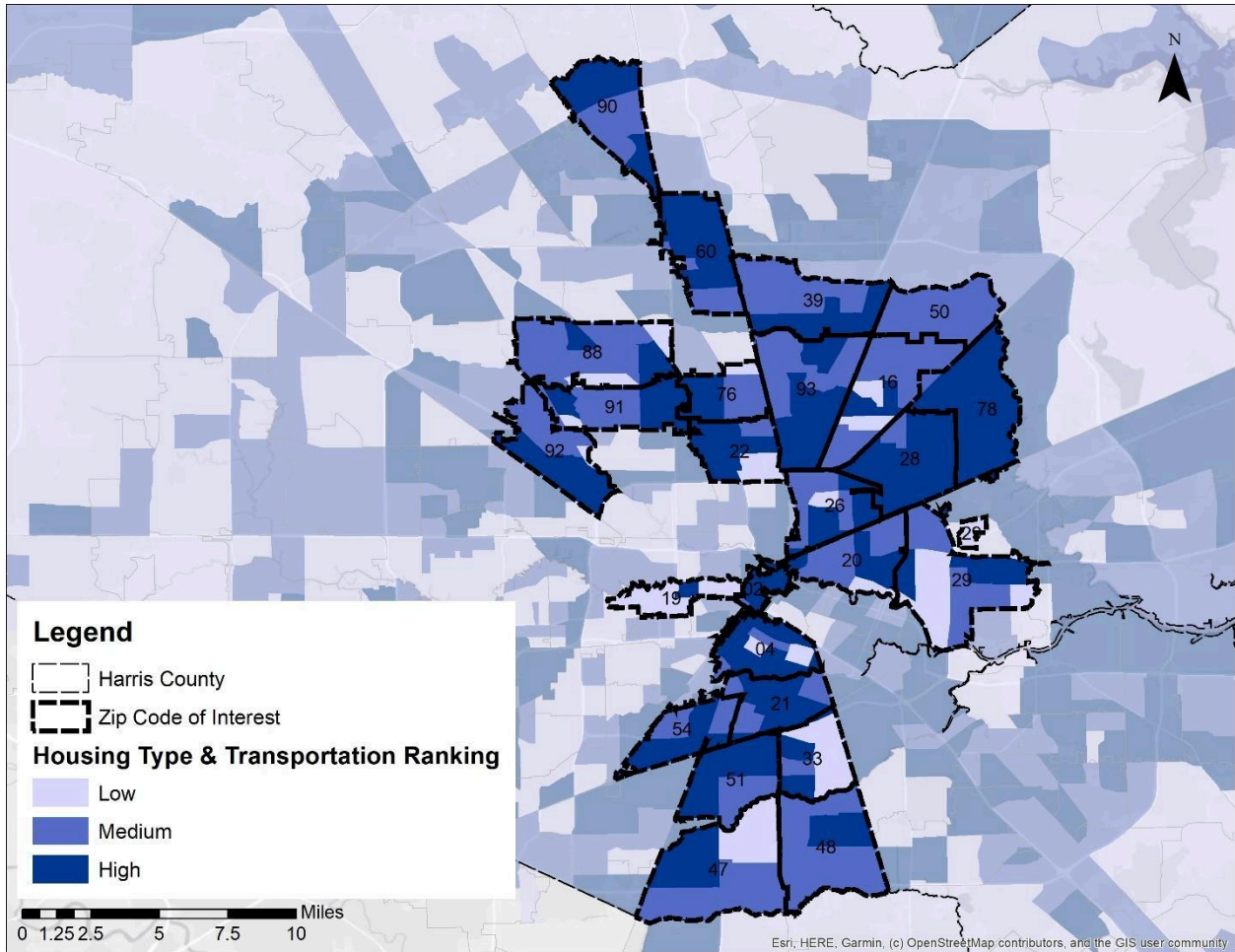
Figure 13 Housing Type and Transportation Vulnerability Ranking

Overall Social Vulnerability Ranking

Each theme's vulnerability ranking, and percentile were summarized and produced an overall ranking for each census tract. The overall ranks determine which pockets of neighborhoods have an overall vulnerability ranking from low to high. Figure 6 displays the least to highest vulnerable areas. Following themes from previous maps, the northeast zip codes are determined to be more vulnerable. It is helpful to identify vulnerability hotspots to identify areas with the

highest concentrations of vulnerable populations. Identifying these areas is vital for emergency responders to focus on vulnerable areas after a disaster. Responders are most likely to send aid, medical, and even more responders to these areas first. Using this map in conjunction to hazard maps can greatly facilitate planning for disasters.
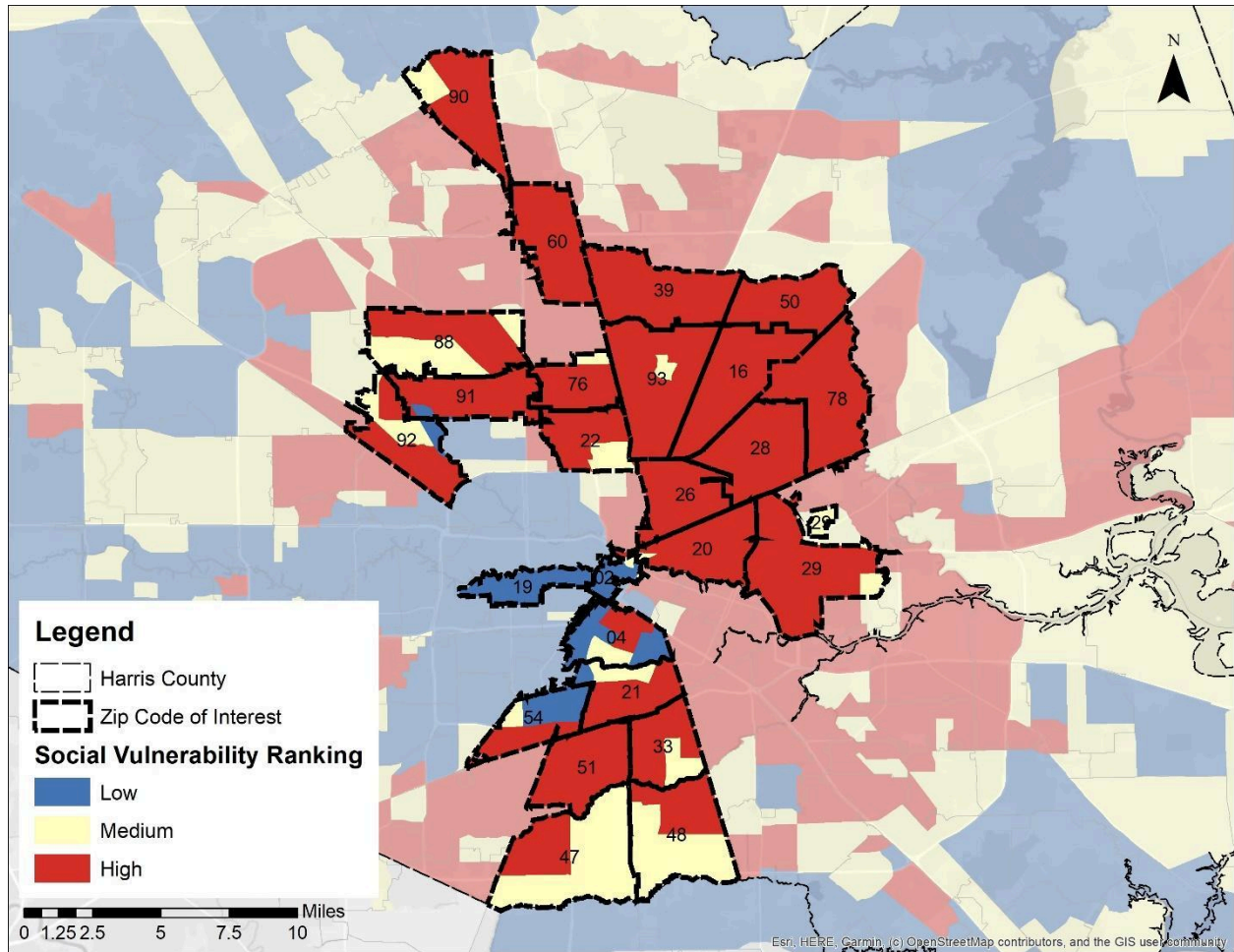
Figure 14 Overall Social Vulnerability Ranking

Current Social and Economic Disparities

Social Population

As mentioned earlier, the CDC uses the 2018 data for SVI calculations. However, the latest Census data available is the 2019 American Community Survey (ACS) 5-Year. This data set collects population and housing data from January 1, 2015, through December 31, 2019; were collected at the zip code level.

Social	Economic
Population and Population Density	Households
Race	Householder by Race
Means of Transportation	Unemployment
Vehicle availability	Unemployment by Race
Health Insurance	Median Household Income
Ability to Speak English	Median Household Income by Race
Disabilities	Owner Occupied Housing Units
Foreign Born	Homeowners by Race
Households that Have No Computer, Smartphone, or Tablet	Poverty
Household without Internet	Poverty by Race
	Housing Tenure (Owner or Renter)
	Housing Tenure by Race

Table 3 Social and Economic Variables

As requested by Charity Productions, these variables were extracted and mapped to display the current state of the 25 zip codes. The total population of all the zip codes 705, 512. The largest populated zip code is 77088, with a population of 55,734. However, it is not enough to know the population of an area. Population density displays a better understanding of how many people live within this area. Population density measures the number of people per unit of an area, which excludes water. This measurement allows us to get a broad sense of how many people would live within one square mile if the U.S. population were evenly distributed across its land area.[1]. Figure 7 displays population density with blue areas being the less populated, red areas the most.

[1] Understanding Population Density (census.gov)
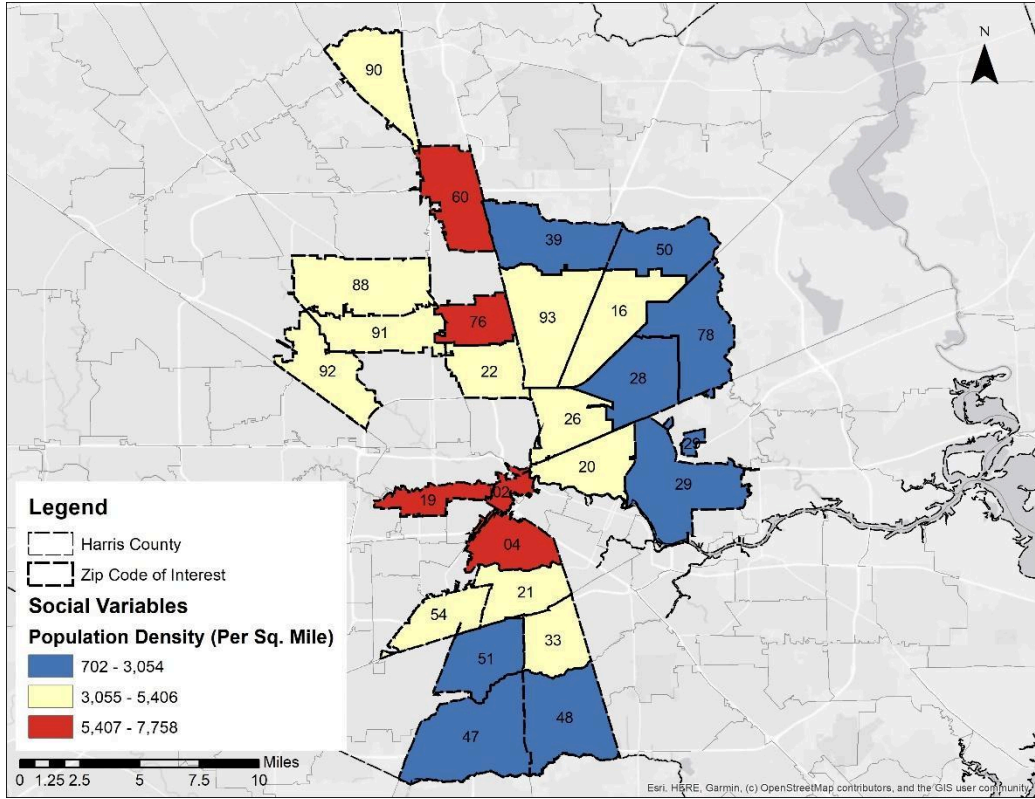
Figure 16 Population Density (Per Sq. Mile)
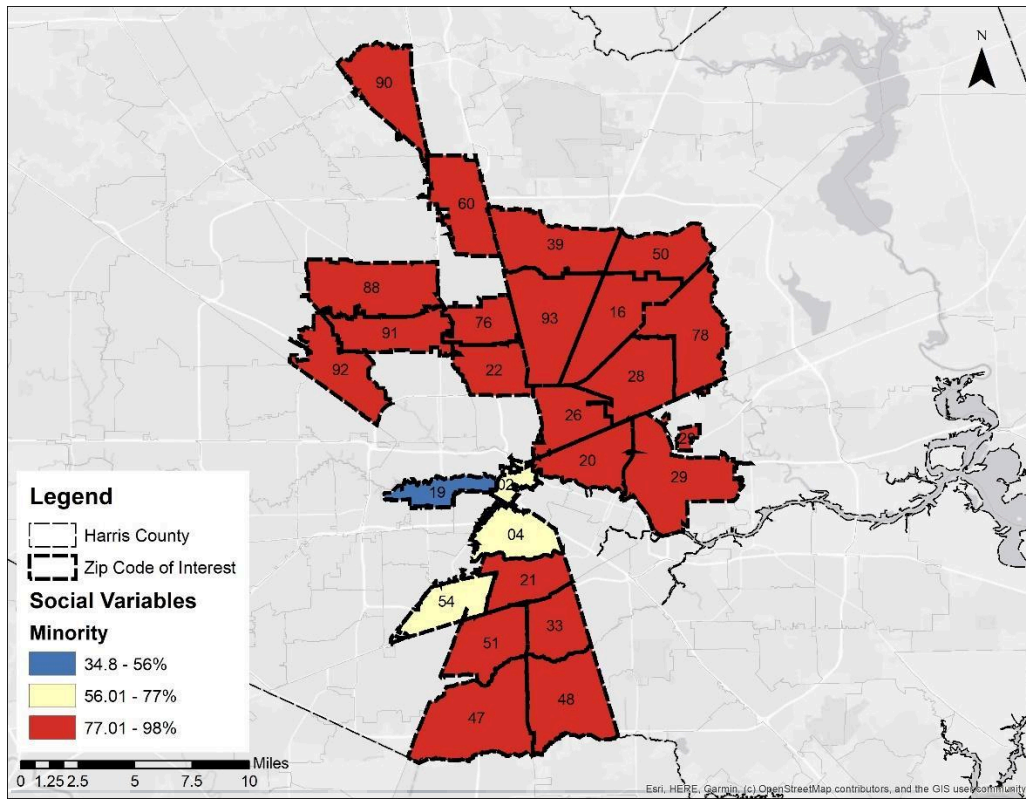
Zip Code	Total Population:	White Alone	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone	Two or More Races	Hispanic or Latino
02	15,613	34.8%	38.2%	0.1%	3.3%	0.0%	0.6%	2.1%	20.9%
04	37,294	27.8%	46.7%	0.0%	9.2%	0.0%	0.9%	2.0%	13.4%
016	30,741	1.4%	62.6%	0.0%	0.4%	0.0%	0.0%	0.2%	35.5%
019	22,057	65.2%	7.4%	0.4%	8.8%	0.0%	0.7%	1.8%	15.7%
020	26,357	3.7%	21.9%	0.2%	0.2%	0.0%	0.1%	0.4%	73.6%
021	26,214	11.0%	70.6%	0.3%	3.5%	0.0%	0.1%	0.3%	14.3%
022	27,924	5.0%	18.9%	0.1%	0.6%	0.0%	0.0%	0.1%	75.3%
026	21,300	2.5%	50.3%	0.0%	0.9%	0.2%	0.0%	0.4%	45.8%
028	17,425	1.9%	66.3%	0.2%	0.0%	0.0%	0.0%	1.3%	30.2%
029	17,781	7.0%	19.9%	0.1%	0.0%	0.0%	0.0%	0.3%	72.7%
033	30,558	1.3%	65.6%	0.0%	0.3%	0.1%	0.0%	1.1%	31.7%
039	28,877	4.9%	8.6%	0.3%	0.7%	0.0%	0.0%	0.2%	85.4%
047	32,616	6.0%	65.0%	0.2%	1.8%	0.0%	0.7%	0.8%	25.5%
048	18,383	2.3%	66.2%	0.1%	0.9%	0.0%	0.6%	0.5%	29.5%
050	4,741	2.2%	39.5%	0.0%	0.0%	0.0%	0.0%	0.0%	58.3%
051	17,221	2.4%	77.2%	0.1%	1.1%	0.0%	0.0%	1.7%	17.4%
054	23,267	27.8%	35.1%	0.5%	24.7%	0.0%	0.7%	3.0%	8.2%
060	45,642	4.8%	15.5%	0.1%	1.5%	0.3%	0.1%	1.0%	76.9%
076	36,009	4.9%	6.3%	0.0%	0.5%	0.0%	0.0%	0.1%	88.2%
078	15,663	4.3%	54.0%	0.5%	0.0%	0.0%	0.0%	0.3%	40.9%
088	55,734	5.2%	37.8%	0.1%	4.1%	0.0%	0.1%	0.9%	51.8%
090	40,761	14.7%	46.8%	0.2%	2.4%	0.0%	0.1%	2.4%	33.2%
091	27,750	8.6%	43.7%	0.1%	0.8%	0.0%	0.0%	1.6%	45.2%
092	38,458	20.7%	11.0%	0.0%	1.5%	0.0%	0.0%	1.3%	65.4%
093	47,135	5.4%	9.4%	0.0%	0.3%	0.0%	0.0%	0.4%	84.4%
TOTAL	705,521	10.7%	36.5%	0.1%	2.7%	0.0%	0.2%	1.0%	48.7%

Table 4 Racial Demographics

The demographic makeup of the population is in figure 8 and table 3. As shown in the map, the zip codes consist up of minority populations. Zip for 77019 has the least number of minorities. The largest racial minority is the African American or Black and Hispanic or Latino population. A large number of minorities in these areas could mean that they established historical communities for decades. The majority of African Americans live in the southernmost zip codes, 021, 051, 033, 047, and 048. Additionally, there is another large African American population in the eastern zip codes, which are 016, 028, and 078. Much of this community lives in the central, eastern, and western zip codes for Hispanic or Latinos.

Zip Code	Use public transport	Do not have vehicle access	Do not Health Insurance Coverage	Speaks English "Not Well" or "Not at all"	Disability	Foreign Born
77002	8.6%	18.6%	13.0%	2.0%	13.7%	12.2%
77004	7.3%	17.4%	12.9%	1.4%	10.4%	14.6%
77016	7.1%	11.7%	24.9%	10.9%	19.7%	15.5%
77019	2.4%	3.8%	5.9%	1.8%	5.0%	18.5%
77020	5.1%	14.7%	31.8%	22.2%	14.9%	26.7%
77021	7.3%	17.6%	16.4%	2.6%	15.5%	9.4%
77022	3.4%	17.5%	29.9%	23.3%	13.8%	30.3%
77026	7.4%	16.7%	31.0%	15.6%	20.7%	17.5%
77028	3.7%	12.3%	22.8%	6.3%	19.6%	12.3%
77029	3.2%	8.5%	24.3%	19.9%	12.8%	31.8%
77033	6.4%	12.9%	22.3%	8.3%	17.1%	12.2%
77039	0.4%	4.5%	37.2%	33.3%	6.6%	35.8%
77047	1.9%	4.0%	17.2%	3.6%	10.1%	12.3%
77048	4.5%	11.0%	18.1%	3.5%	11.9%	9.4%
77050	0.7%	6.0%	35.6%	18.1%	15.3%	26.2%
77051	6.7%	17.5%	19.7%	3.9%	19.7%	8.7%
77054	13.1%	7.1%	9.4%	2.6%	5.8%	34.4%
77060	3.8%	13.1%	39.7%	36.6%	6.9%	41.8%
77076	2.8%	8.4%	37.2%	31.2%	4.6%	33.9%
77078	3.1%	13.4%	18.9%	10.5%	13.6%	18.3%
77088	3.0%	8.2%	26.9%	14.8%	11.5%	24.8%
77090	3.8%	9.6%	20.9%	7.9%	10.6%	16.2%
77091	4.8%	12.6%	32.2%	16.7%	12.1%	23.4%
77092	2.8%	9.2%	27.2%	22.4%	10.5%	32.3%
77093	1.8%	8.4%	34.3%	31.6%	7.6%	33.6%
TOTAL	4.5%	11.1%	25.5%	15.5%	11.6%	23.5%

Table 5 Social Variables

The City of Houston possesses a public transportation system. These services are available through the METRO. With public transportation services available, vehicles are as dependent compared to more rural areas. Communities in 054 and 004 are the most familiar with the usage of public transit use. However, in rapid evacuation situations, residents must find other forms of transportation to evacuate hazardous areas. It is crucial to document communities that do not have vehicle access. The more central zip codes do not have vehicle access. Communities that depend on public transportation and do not have vehicle access are dependent on others to evacuate hazardous zones. This population depends on either family members, friends, or governmental programs to evacuate and seek shelter.

Threats such as the COVID-19-pandemic widely displayed disparities and inaccessibility to posses' health insurance. At the beginning of the pandemic, a simple coronavirus test could cost an individual as must as $100.[15] Overtime, many hospitals, higher education institutions, medical

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[15] [Most Coronavirus Tests Cost About $100. Why Did One Cost $2,315? - The New York Times (nytimes.com)](#)

clinics, and other agencies provided tests at affordable prices, even free. Without reduced prices, many low-income families would not have been able to get tested and prevent the spread of

COVID-19.

Out of all social variables, no health insurance coverage is the highest number, with the 093-zip code as the most uninsured area. Disabled populations are highly vulnerable and dependent on others. Five zip codes fall within the highest range, which is 15.01%-20%. Figure X, in the appendix, displays the patterns of people with disabilities throughout the zip codes. The highest concentration of disabled people falls within central east zip codes and the second most southern areas.

Non-English speakers pose a communication issue during all levels of disaster management. Immigrant populations are most likely to be less fluent in English, and Spanish speakers are expected to increase in the United States. [1]. Increasing language diversity in disaster awareness would lower barriers faced by non-English speaking communities. There is a high concentration of limited-English speakers in the northern zip codes with a range of 24.01-36%. It is also important to note that the 060-zip code has the largest concentration with 14,726. Foreign-born populations face discrimination during disasters. Suppose recovery aid is limited due to no citizenship status or different visas status. Depending on aid eligibility, immigrant populations lack access to funding during recovery efforts. [2]. Foreign-born populations follow slightly similar trends to the non-English speaking map. Like the non-English speaker population, the

060 area has the highest foreign-born population. It is essential to build trust and relationships and regularly engage with immigrant populations to reduce vulnerabilities, language limitations and increase resilience.

[1] Instituto Cervantes. (2019). El español: Una lengua viva. Annual Rep. Retrieved from https://cvc.cervantes.es/lengua/espanol_lengua_viva/pdf/espanol_lengua_viva_2019.pdf
[2] Méndez, M., Flores-Haro, G., & Zucker, L. (2020). The (in) visible victims of disaster: Understanding the vulnerability of undocumented Latino/a and indigenous immigrants. Geoforum, 116, 50- 62.Morrow, B. H. (1999). Identifying and mapping community vulnerability. Disasters, 23(1), 1- 18.

Economic Population

Economic variables were extracted to understand the current state of housing, income, poverty, unemployment, and tenure of each zip code. In addition, data that intersected economic using race and ethnicity to understand disparities of minority populations.

The Census describes a household as "people who occupy a housing unit" and a housing unit as "a house, an apartment, mobile home, group of rooms, or single room that occupies a separate living quarter." [1] By this definition, households include a related and unrelated family who share the housing unit. A person who lives alone or a group of unrelated people sharing a house also falls within a household. Another important term is householder, which refers to the person in whose name the housing unit is owned or rented. [2]. The number of households equals the number of householders. After households, the Census breaks down to owner-occupied or renter-occupied. The housing unit is considered owned if the owner or co-owner lives in the units, even if the mortgage is not entirely paid. The other units are classified as rented if units are rented for cash rent and occupied without paying rent.

[1] A10010. Households by Race of Householder [10] - Social Explorer Tables: ACS 2019 (5-Year Estimates) (SE) - ACS 2019 (5-Year Estimates) - Social Explorer
[2] Subject Definitions (census.gov)

Most households in the zip codes are rented, meaning most people do not own their homes. The 090-zip code is the highest area with rented individuals, while 088 has the most owned units. Figure 9 displays the total number of households in the area, and table 5 displays households by the race of the householder. Households in red display the largest range of households. Table 6 depicts the median household income and median household income by race in each zip code. The average household income is $43,408, compared to the average for African Americans is $32,668.
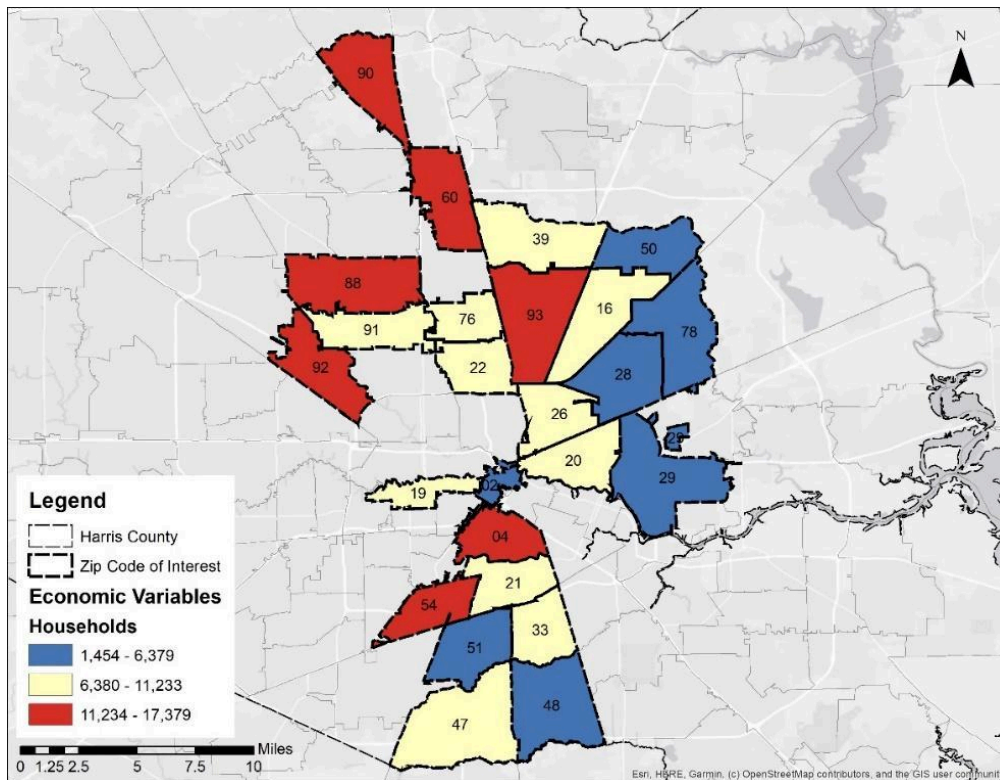
Zip Code	Total Households	Owner Occupied	Renter Occupied	Owner Occupied (White Alone, Not Hispanic Or Latino Householder)	Renter Occupied (White Alone, Not Hispanic Or Latino Householder)	Owner Occupied (Non-White Householder)	Renter Occupied (Non-White Householder)
02	4,678	17.0%	83.0%	12.2%	50.1%	4.9%	32.8%
04	13,418	33.6%	66.4%	10.5%	16.6%	23.0%	49.9%
016	9,679	59.5%	40.5%	1.0%	0.9%	58.5%	39.6%
019	11,233	51.0%	49.0%	39.1%	31.9%	11.9%	17.1%
020	8,670	44.7%	55.3%	2.6%	2.9%	42.1%	52.4%
021	10,720	38.8%	61.2%	3.7%	7.6%	35.1%	53.6%
022	9,255	43.8%	56.2%	3.9%	5.3%	39.9%	50.8%
026	7,960	40.3%	59.7%	0.5%	1.3%	39.8%	58.5%
028	5,847	55.9%	44.1%	2.1%	0.9%	53.8%	43.2%
029	5,647	62.0%	38.0%	6.5%	3.6%	55.5%	34.4%
033	9,165	58.4%	41.6%	0.7%	0.4%	57.8%	41.1%
039	7,607	59.7%	40.3%	7.5%	1.3%	52.3%	39.0%
047	10,533	68.5%	31.5%	4.8%	2.4%	63.7%	29.1%
048	6,041	60.9%	39.1%	2.1%	0.7%	58.8%	38.4%
050	1,454	77.6%	22.4%	1.7%	0.3%	75.9%	22.1%
051	6,379	38.3%	61.7%	2.1%	0.9%	36.2%	60.8%
054	13,097	14.8%	85.2%	5.6%	22.7%	9.2%	62.5%
060	14,165	22.2%	77.8%	3.1%	4.5%	19.1%	73.3%
076	10,382	47.6%	52.4%	6.3%	2.4%	41.3%	50.1%
078	4,640	60.7%	39.3%	2.3%	2.5%	58.4%	36.7%
088	17,379	61.9%	38.1%	8.2%	0.8%	53.7%	37.3%
090	15,927	21.6%	78.4%	8.4%	9.9%	13.2%	68.5%
091	9,911	40.7%	59.3%	6.7%	3.6%	34.1%	55.7%
092	13,954	35.6%	64.4%	20.1%	11.5%	15.6%	52.9%
093	12,831	56.9%	43.1%	5.4%	2.8%	51.5%	40.3%
TOTAL	240,572	44.3%	55.7%	7.6%	7.8%	36.7%	47.9%

Table 6 Households

| Zip Code	Median Household Income (In 2019 Inflation Adjusted Dollars)	White Alone Householder	Black or African American Alone Householder	American Indian and Alaska Native Alone Householder	Asian Alone	Native Hawaiian and Other Pacific Islander Alone Householder	Some Other Race Alone Householder	Two or More Races Householder	Hispanic or Latino Householder
002	$71,369	$80,313	$37,917	-	$72,778	-	$75,150	$69,821	$81,115
004	$51,309	$81,241	$31,332	-	$132,123	-	$76,625	-	$57,971
016	$36,335	$43,010	$34,091	-	-	-	$30,000	-	$41,047
019	$116,207	$123,808	$23,500	-	$128,656	-	$31,250	$195,060	$93,472
020	$32,207	$34,417	$21,189	-	-	-	$42,058	$41,645	$35,631
021	$37,913	$62,031	$32,267	-	$92,125	-	$20,357	-	$40,110
022	$31,183	$34,141	$19,249	-	-	-	$42,228	$52,969	$34,985
026	$28,678	$34,688	$25,244	-	-	-	$35,515	-	$34,536
028	$29,014	$35,750	$27,852	-	-	-	-	$29,135	$40,500
029	$38,183	$41,694	$31,134	$35,250	-	-	$41,667	-	$40,515
033	$38,162	$44,136	$34,132	-	-	-	$49,135	$25,000	$45,545
039	$36,769	$36,552	$38,958	$27,629	$14,271	-	$71,058	-	$36,675
047	$67,725	$60,532	$68,993	-	$83,622	-	-	-	$58,125
048	$41,300	$61,450	$31,808	-	$52,589	-	$91,250	$94,643	$62,200
050	$48,500	$41,831	$51,111	-	-	-	$64,821	-	$42,165
051	$30,646	$46,198	$26,261	-	-	-	-	$61,786	$53,077
054	$50,827	$54,973	$46,184	-	$54,338	-	$37,179	-	$35,119
060	$31,006	$32,262	$26,834	$43,177	$26,577	-	$33,413	$39,872	$32,748
076	$38,346	$39,297	$24,975	-	$37,591	-	$48,173	$32,438	$39,902
078	$40,298	$49,831	$34,728	-	-	-	-	$68,257	$52,695
088	$42,489	$51,795	$33,510	$11,114	$53,789	-	$54,961	$68,992	$49,404
090	$39,808	$51,670	$32,623	-	-	-	$51,405	$60,685	$47,438
091	$36,098	$41,473	$30,396	-	-	-	$48,750	$59,286	$36,926
092	$39,536	$48,559	$31,905	-	$47,813	-	$29,444	$37,500	$31,852
093	$31,301	$32,360	$20,503	-	$57,167	-	$38,417	-	$33,424

Table 7 Median Household Income by Race (In 2019 Inflation Adjusted $)

There is a severe income gap more evident when poverty is shown. Table 7 displays poverty rates, and figure 10 maps percentages of minority populations in poverty. 13 zip codes lie within the highest poverty range from 28.01% - 36%. People living below the poverty level are less like to have assets to prepare for and recover from disasters. [1]. With many individuals living below the poverty, disaster management personnel could use this information to secure flexible aid programs for victims of disasters. Unemployed people are all people who were not employed when the census was collected. Unemployment depicts the number of people from the labor force over the age of 16 and are either jobless, without work, and are available for work, or have taken specific steps to find work. The highest range of unemployment is from 10%-14%, as shown in Figure 11.

[1] Morrow, B. H. (1999). Identifying and mapping community vulnerability. Disasters, 23(1), 1- 18.

Zip Code	Population for Whom Poverty Status Is Determined	Income in the Past 12 Months Below Poverty Level	White Alone, Not Hispanic or Latino Population for Whom Poverty Status Is Determined	Income Below Poverty Level (White Alone, Not Hispanic or Latino)	Minority Population for Whom Poverty Status Is Determined	Income Below Poverty Level (Minority)
02	7,264	23.2%	4,043	16.9%	3,221	31.1%
04	28,539	25.0%	7,265	13.5%	21,274	28.9%
016	30,518	26.6%	425	43.3%	30,093	26.4%
019	22,002	9.6%	14,335	5.1%	7,667	18.0%
020	26,210	32.0%	968	24.7%	25,242	32.3%
021	25,948	28.9%	2,720	15.5%	23,228	30.4%
022	27,815	32.8%	1,365	22.5%	26,450	33.4%
026	21,270	33.9%	516	25.2%	20,754	34.2%
028	17,393	29.2%	337	48.4%	17,056	28.8%
029	17,668	27.3%	1,204	15.8%	16,464	28.1%
033	30,438	27.9%	358	52.0%	30,080	27.6%
039	28,835	33.0%	1,397	13.0%	27,438	34.0%
047	32,556	12.0%	1,961	8.6%	30,595	12.3%
048	18,296	24.3%	416	4.6%	17,880	24.7%
050	4,741	20.8%	104	4.8%	4,637	21.2%
051	17,185	35.3%	421	5.7%	16,764	36.1%
054	23,174	21.2%	6,397	19.4%	16,777	21.9%
060	45,575	33.0%	2,159	21.0%	43,416	33.6%
076	35,866	30.9%	1,731	10.7%	34,135	31.9%
078	15,622	18.5%	677	43.4%	14,945	17.4%
088	55,584	20.8%	2,884	7.4%	52,700	21.6%
090	40,491	21.6%	5,861	10.4%	34,630	23.4%
091	27,496	25.1%	2,367	22.0%	25,129	25.4%
092	38,312	31.5%	7,890	11.1%	30,422	36.8%
093	47,058	36.5%	2,499	40.7%	44,559	36.3%
TOTAL	685,856	27.0%	70,300	14.3%	615,556	28.4%

Table 8 Poverty and Poverty by Race

33
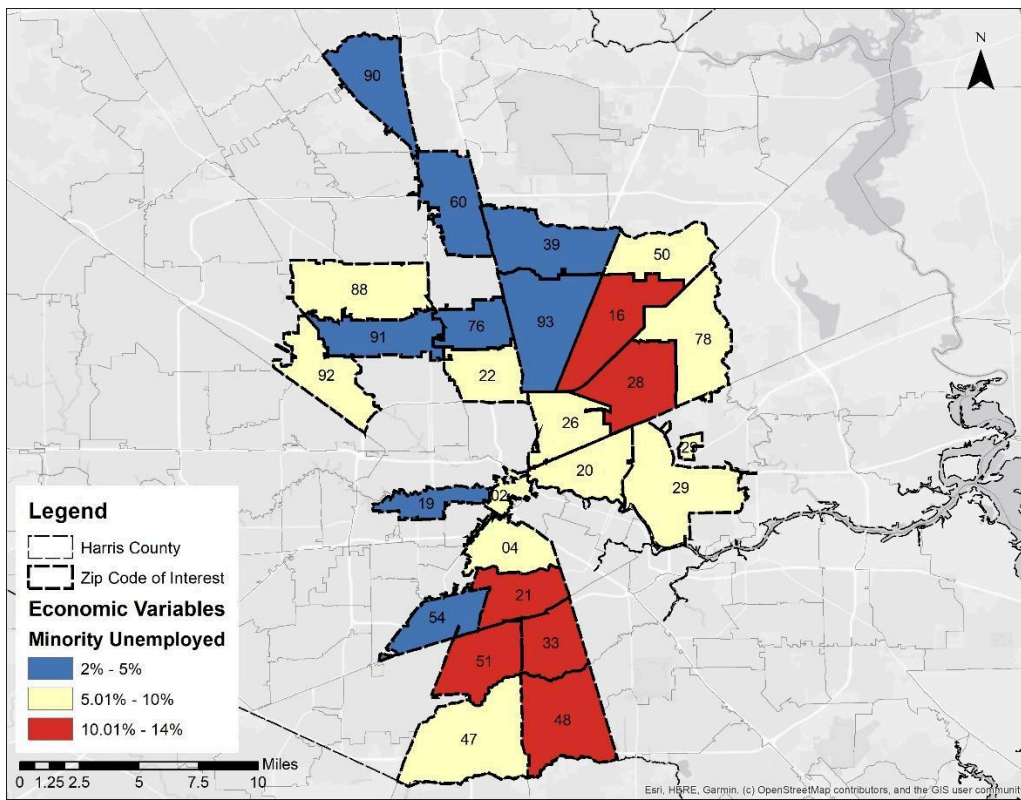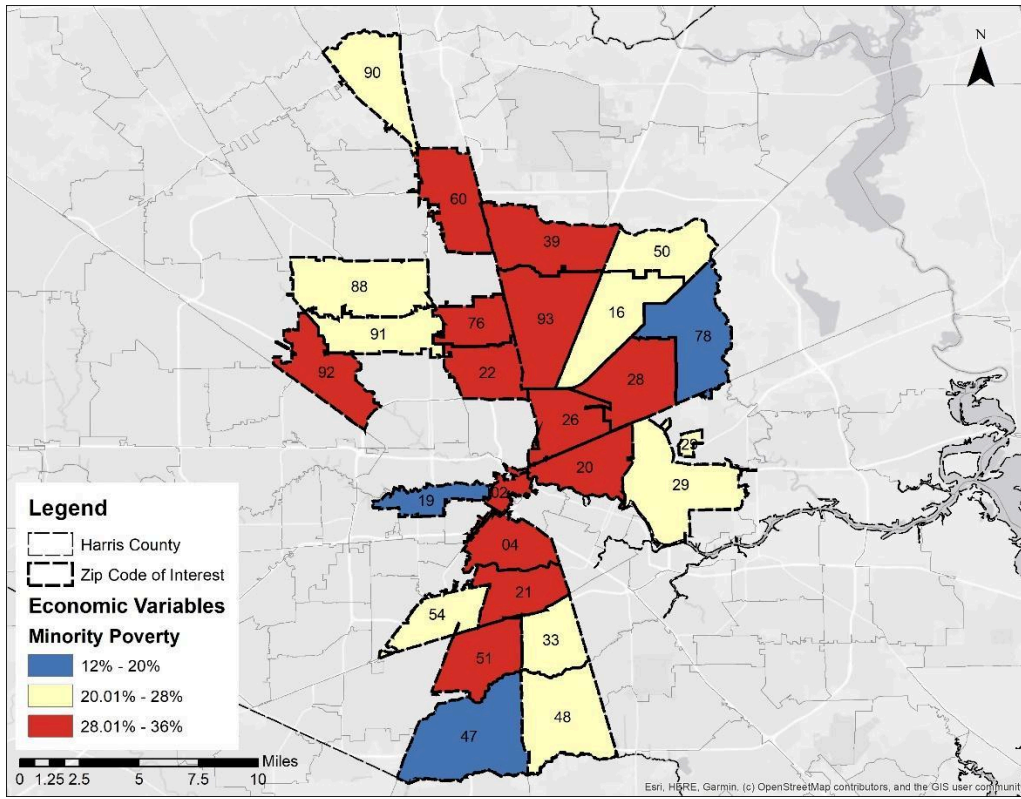
FEMA Individual Housing Assistance

The purpose of FEMA's (Federal Emergency Management Agency) Individuals and Households Assistance (IHA) program is to provide financial and direct services to eligible individuals and households affected by disasters. [1]. The program assists with funds for temporary housing, temporary housing units, repair or replacement of owner-occupied homes, hazard mitigation assistance for homeowner repairs, and other uninsured or under-insured disaster caused expenses and serious needs.

FEMA's public source database, Open FEMA, provides the public with datasets to encourage accountability, transparency and encourages collaborations with community partners. In its missions' spirits, data from the IHA program was extracted for the 25 zip codes. The amount of assistance received to the zip codes can be determined by mapping the variables. The table displays the variables that were provided through Open FEMA. [1] Individuals and Households Program | FEMA.gov
.

IHA Variables	Description
Applications	Total number of applications to the Individual Assistance Housing Program
Average Gross Income	Average self-reported gross income
Special needs indicator	Applicant requires special accommodations to use FEMA assistance
Personal Property Eligible	Is the applicant eligible for FEMA's Other Needs Assistance (ONA) to cover damaged personal property
Rental Assistance eligible	Is applicant eligible for FEMA rental assistance
Repair Assistance Eligible	Is applicant eligible for FEMA assistance to repair the damaged dwelling
Replacement Assistance Eligible	Is applicant eligible for FEMA assistance to replace the damaged dwelling
Small Business Assistance Eligible	Is applicant eligible for a Small Business Association loan
Temporary Sheltering Assistance	Is applicant eligible for Temporary Sheltering Assistance
Destroyed	Is structure permanently uninhabitable
Habitability Repairs Required	Are repairs required to make the dwelling habitable
Flood Damage Indicator	Was damage caused by flooding
Flood Insurance Indicator	Does the applicant have flood insurance
Foundation damage Indicator	Has the damaged dwelling's foundation been damaged
Roof Damage Indicator	Has the damage dwelling's roof been damaged
Foundation Damage amount	Foundation damage amount observed by FEMA
Roof damage amount	Roof damage amount observed by FEMA
Rental Assistance Amount	Amount of Rental Assistance in dollars
Repair Amount	Amount of Repair Assistance in dollars
Replacement Amount	-
TSA Checked In	Has applicant checked in to FEMA provided Temporary Sheltering Assistance facility

Table 9 IHA Variables

There were plenty of requirements to qualify for assistance. There are five major assistances options, which were:

1. Temporary Housing for uninhabitable homes
2. Temporary housing units
3. Repairs or replacement of owner-occupied homes
4. Other uninsured or under-insured disaster caused expenses
5. Hazard mitigation assistance

For temporary housing, applicants must need a place to live. At the same time, their home is repaired temporarily, or until permanent housing is secured. [1]. Disaster survivors had to have their home uninhabitable because of a disaster, agree to relocate. Housing needs were not covered by insurance. Then, applicants could apply for transitional sheltering assistance. Temporary sheltering applications had to be displaced and taken refuge in emergency shelters, or if the home was inaccessible due to a disaster. [2]. Rental assistance and FEMA temporary shelters were also available for those applicants.

Home repairs or replacements funds were available for homeowners. Homeowners had to want to either rebuild or make basic repairs to create home more resilient to hazards. Eligibility depended on results from FEMA inspections and if a housing unit was not covered by insurance. Direct temporary housing also become available for applicants whose homes were destroyed by disaster or have no other practical temporary housing options due to a lack of available rental resources. [1]. Other needs assistance was made available for applicants, which covered child-care, medical, and dental, funeral and burial, damages to essential household items, fuel for a primary heat source, clean-up items, damage to the essential vehicle, moving and storage expense, and other serious needs determined by FEMA.[2]

Lastly, FEMA opened funds for homeowners to provide specific mitigation measures to their homes. Specifically, homeowners had to make roof repairs to withstand higher winds, elevate water heater to avoid flood damage, and elevate electrical panels to avoid flood damage. [1]. Approved applicants received assistance up to $36,000.

[1] Hazard Mitigation Under the Individuals and Households Program | FEMA.gov
[1] Possible Sheltering and Housing Assistance for Disaster Survivors | FEMA.gov
[2] Assistance for Housing and Other Needs | FEMA.gov
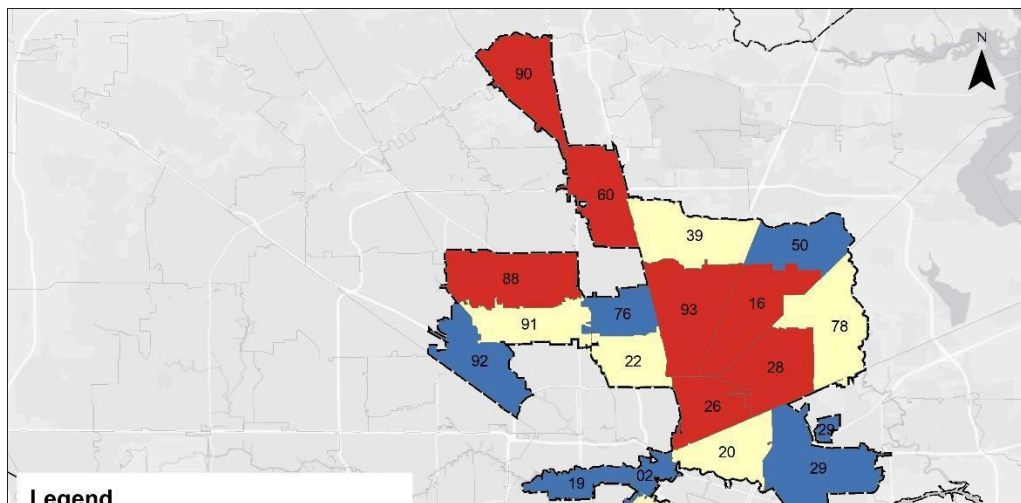
In total, the zip codes turned in 109,847 applications to the IHA program, with the most extensive application coming from the 090-zip code. Figure 13 displays ranges of applications from the zip codes. The most extensive range is from 5,156 to 8,175, shown in red. In the appendix, Figure X displays the average gross income of the applicants. Only one of the zip codes, 002, lies within the highest income range. Ten zip codes fall within the lowest income range, from $749 to $2,926. The gross income for the dataset was self-reported. Lastly, the application reported if the applicant requires special needs accommodations. Only five zip codes fell within the most significant number of special needs applicants, and 458 special needs indicators came from the 026-zip code.

FEMA determined eligibility for the available funds. The datasets provided eligibility for personal property, and other needs, rental assistance, repair assistance, replacement assistance, and SBA (Small Business Administration) grant eligibility. Figure 14 displays the number of applicants that were eligible for personal property and other needs assistance.
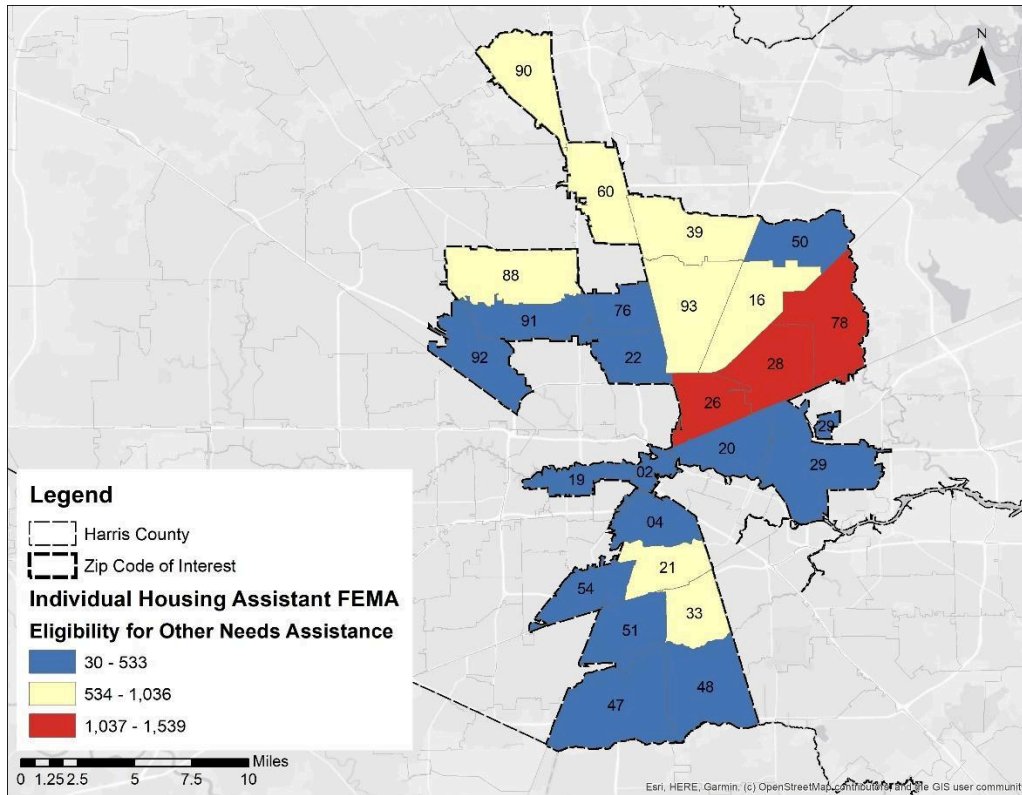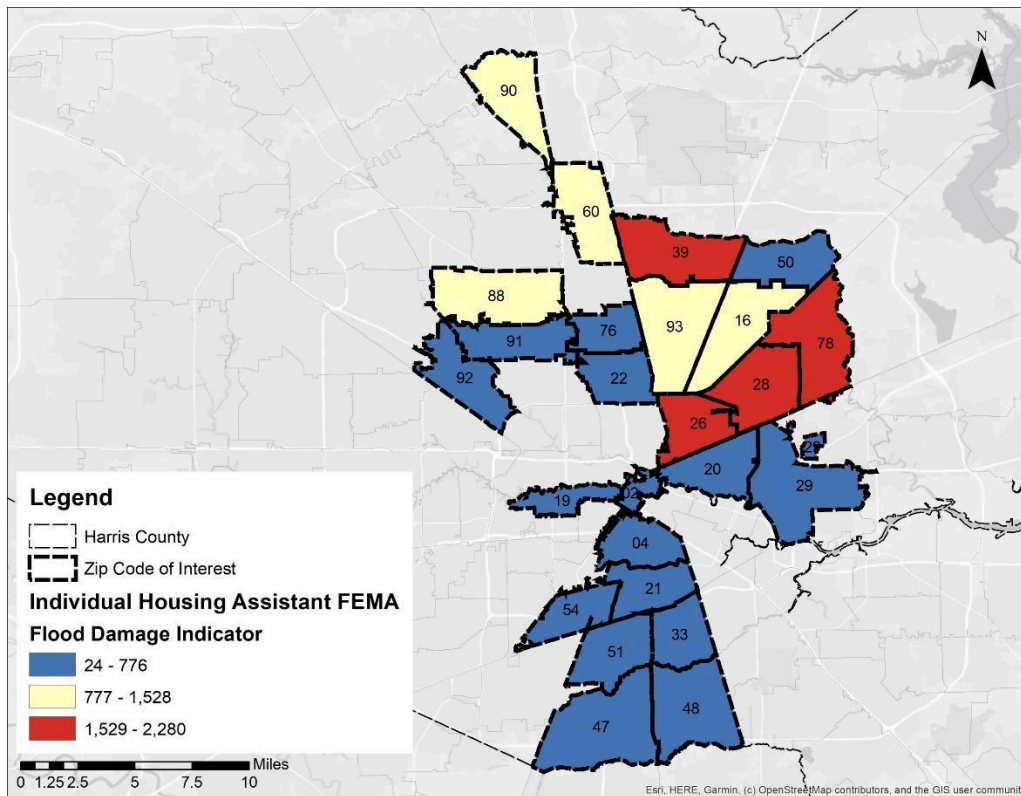
 A total of 13,947 applicants were eligible for personal property and other needs grants. Out of these applicants, the majority of the eligible applicants came from the 026, 028, and 078 zip codes. About half of the zip codes were in the median range of eligibility, which is 534 – 1,036 applicants. There were 12% of applicants eligible for rental assistance. Applicants from 078 and 028 had the highest amounts of eligible applicants with 1,700 and 1,600, respectively. Repair assistance gave applicants the ability to repair housing units. Only 12% of the applicants were eligible for repair assistance. Like rental assistance, most eligible applicants for repair assistance came from the 028 and 078 areas. For SBA eligibility, 1.5% of applicants from 028 and 039 were the highest eligible. The replacement assistance gives the applicant assistance to replace the damaged unit. Out of all zip codes, only one replacement assistant applicant was eligible in the 029-zip code. Lastly, temporary sheltering assistance (TSA) had the highest number of eligible applicants, with 35%. Eligibility maps are available in the appendix.
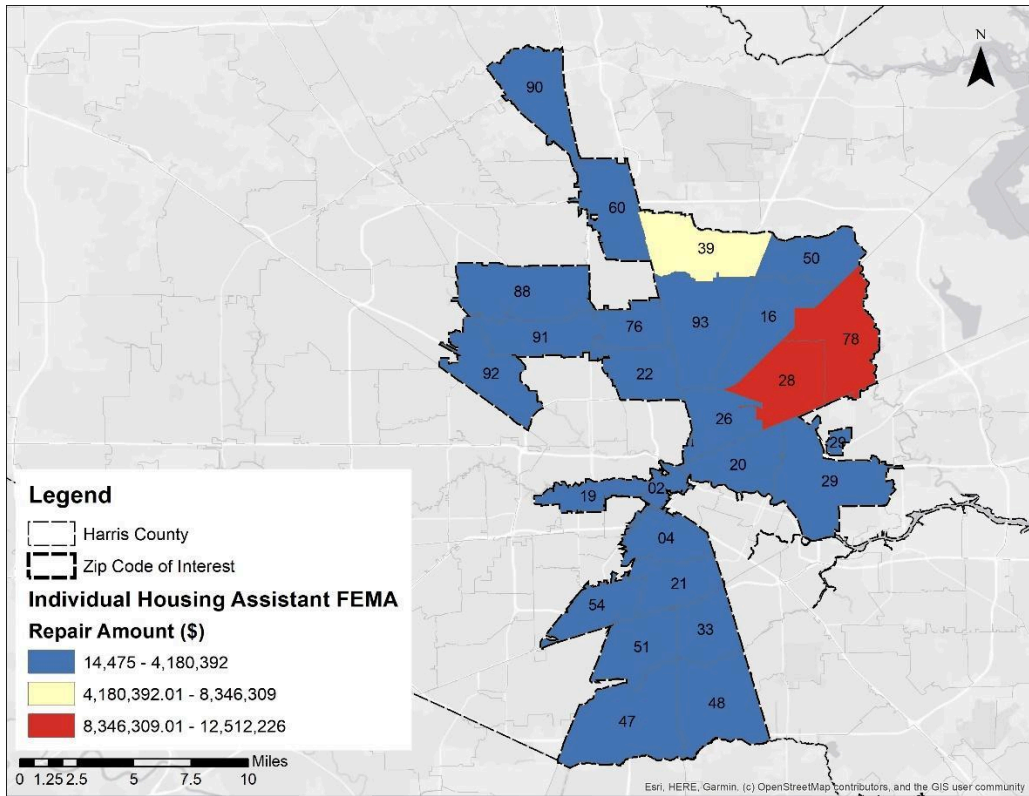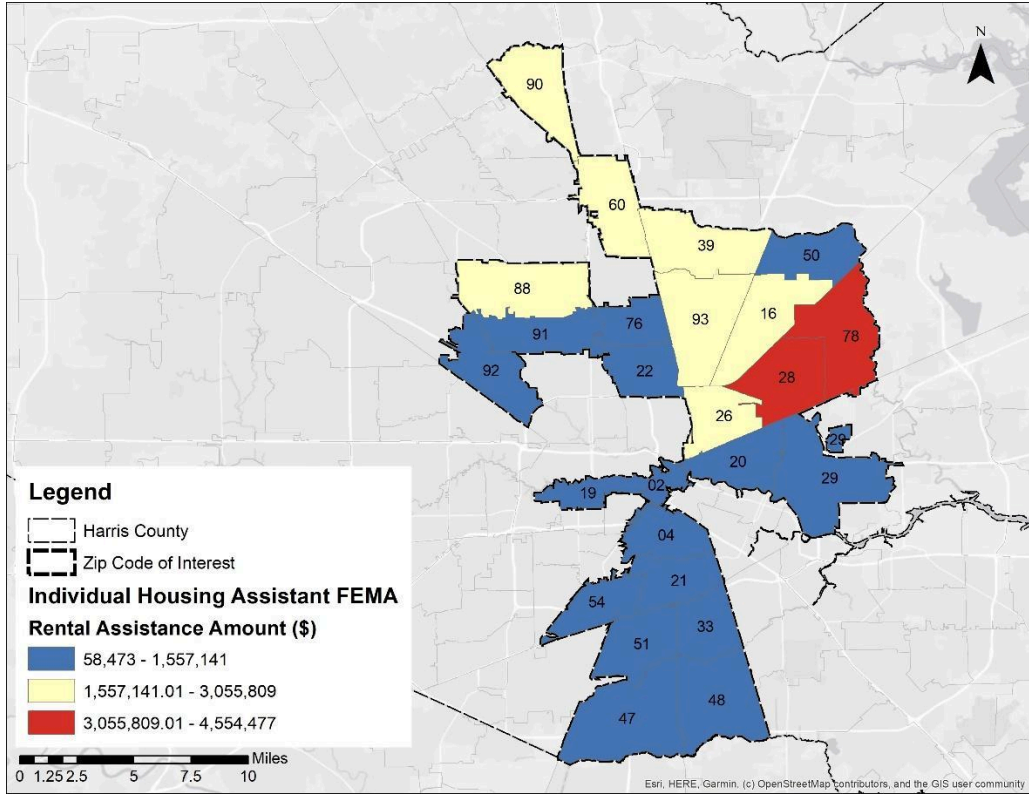
Water damage is typical during hurricane events. Before a hurricane hits, storm surges cause water to rise and create a tsunami-like phenomenon. These powerful forces of wins and water bear down on homes and may cause them to collapse. FEMA determined damage from flooding and if the foundation or roof were impacted. The next set of variables analyzed were indicators of damage to the housing units. In total, 36 homes were destroyed by a disaster. Only six homes were destroyed in the 004-zip code and 5 in the 002-zip code. Fortunately, 21 zip codes fell within the lowest uninhabitable structures range, which is 0-2. Through their inspections, FEMA determined if repairs were required to make housing units habitable. FEMA determined that 19,376 housing units needed repairs. In the 028-zip code, 2,266 housing units required repairs: the

highest of all the zip codes. It is notable to mention that all the southern zip codes had the least number of repairs needed.

Damage costs are determined by flood insurance. Flood insurance covers losses directly from flooding. A total of 6,844 (6%) of applicants had flood insurance. The 088-zip code had 761 applicants covered for flood insurance. Three northern zip codes were the least uninsured, with a range from 38 – 181. There were 19,022 damaged dwellings caused by flooding. Figure 15 displays how many dwellings were damaged from flooding. Zip codes labeled in red represent the highest range of units damaged from flooding. The 028-zip had 2,280 damaged units, which is the highest of all zip codes. On top of the flooding, FEMA determined if dwellings' roofs or foundations were damaged. Roofs were damaged more than the dwelling's foundations, with 3,971 and 743, respectively. Zip codes in the 016-zip codes acquired the most roof damage, while the 026-zip code experienced foundation damage. FEMA also evaluated the damage amount for roofs and foundations. There was a total of $1,044,520 damage for roofs, and $1,423,270 foundation damage. Map for flood and foundations indicators and amounts are located in the appendix.
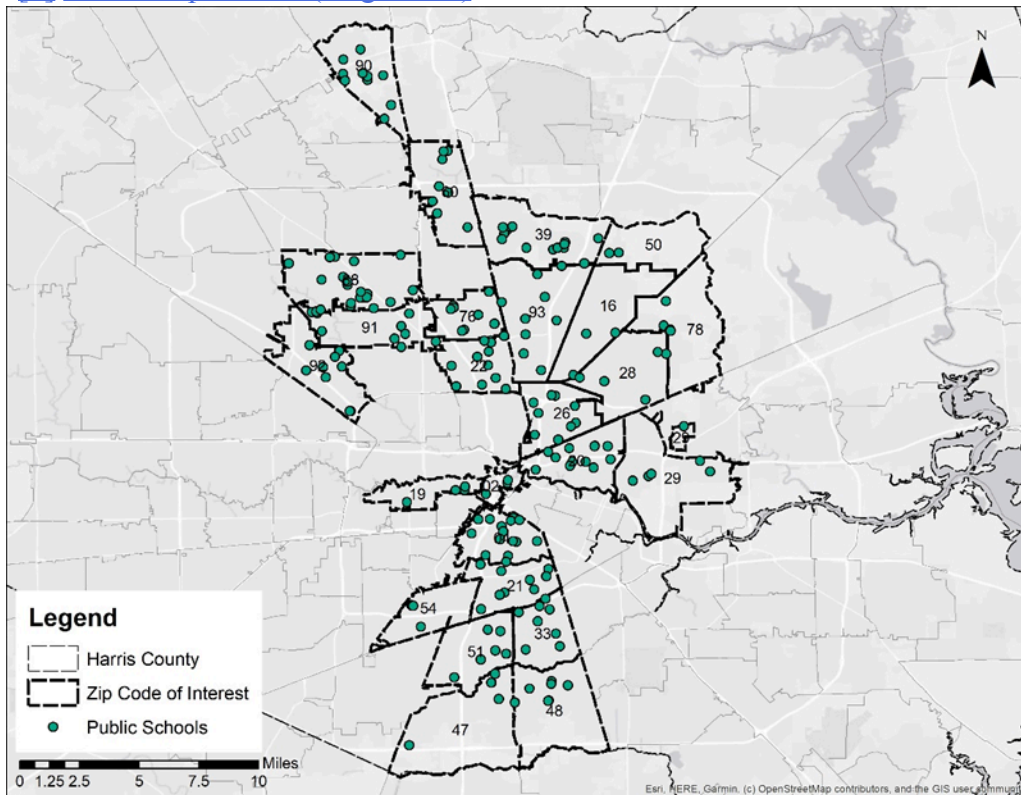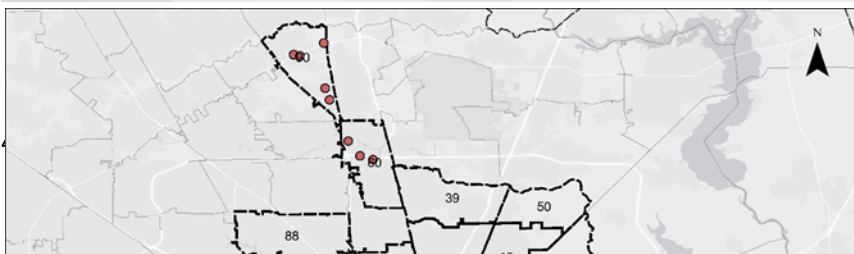
Figure 23 Flood Damage Indicator

Legend

- Harris County
- Zip Code of Interest

Individual Housing Assistant FEMA

Roof damage amount ($)
- 170 - 33,299
- 33,300 - 66,429
- 66,430 - 99,559

Miles
0 1.25 2.5 5 7.5 10

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

After analyzing damage indicators and amounts, assistance funds were distributed to applicants. The IHA database displayed assistance amounts in dollars for rental, repairs, and replacements. Zip codes received a total of $32,998,016 in rental assistance, and $62,074,157 in Repair assistance. Only one applicant from the 029-zip code received $30,747 funds for replacement assistance.

Figure 17 to 18 displays maps of low to high ranges for rental and repairs assistance received, respectively. For rentals, the 078-zip received the most assistance ($4,554,477), while the 002 received the least ($58,473). For repairs, the 078 received the most assistance ($12,512,226), while the 054 received the least ($14,475). Additionally, FEMA noted whenever an applicant checked into a temporary sheltering assistance facility. A total of 5,825 applicants checked-in to housing sheltering. Majority of check-ins came from the 028-zip code, followed by the 028.

By intersecting assistance received by other variables, which zip codes were prioritized for funding can be determined. For example, the 023 and 033 zip codes fell within the highest range of complete applications sent; however, they fell within the lowest range of assistance received. Additionally, other variables such as flood damage indicators or dwellings destroyed are essential factors that could measure the different amounts of assistance received. Further analysis of this database can be broken down into Census Block, displaying the number of funds received per neighborhood. The eligibility and applications process are other barriers that could have depleted applicants' chances to receive assistance.
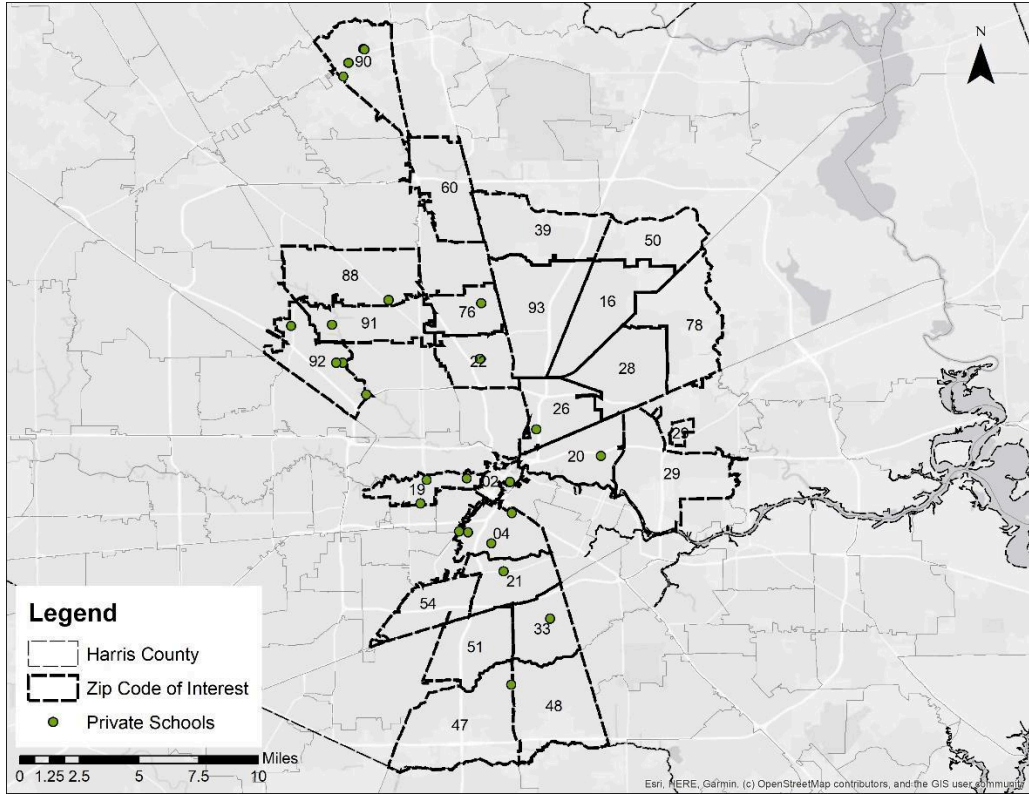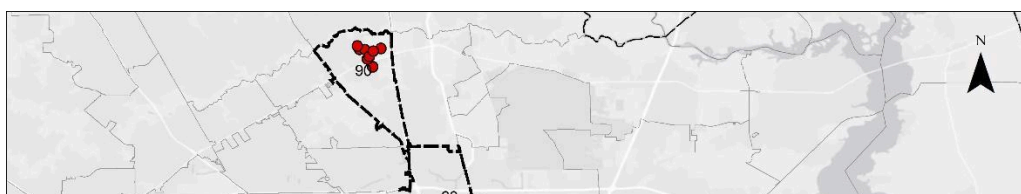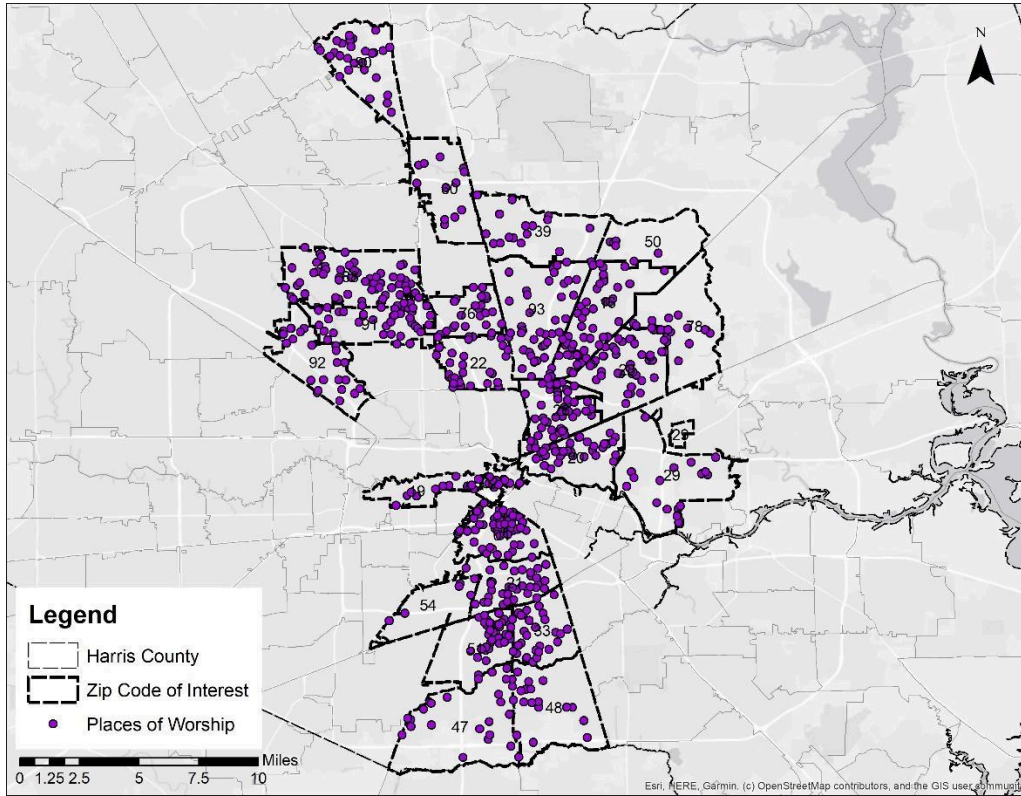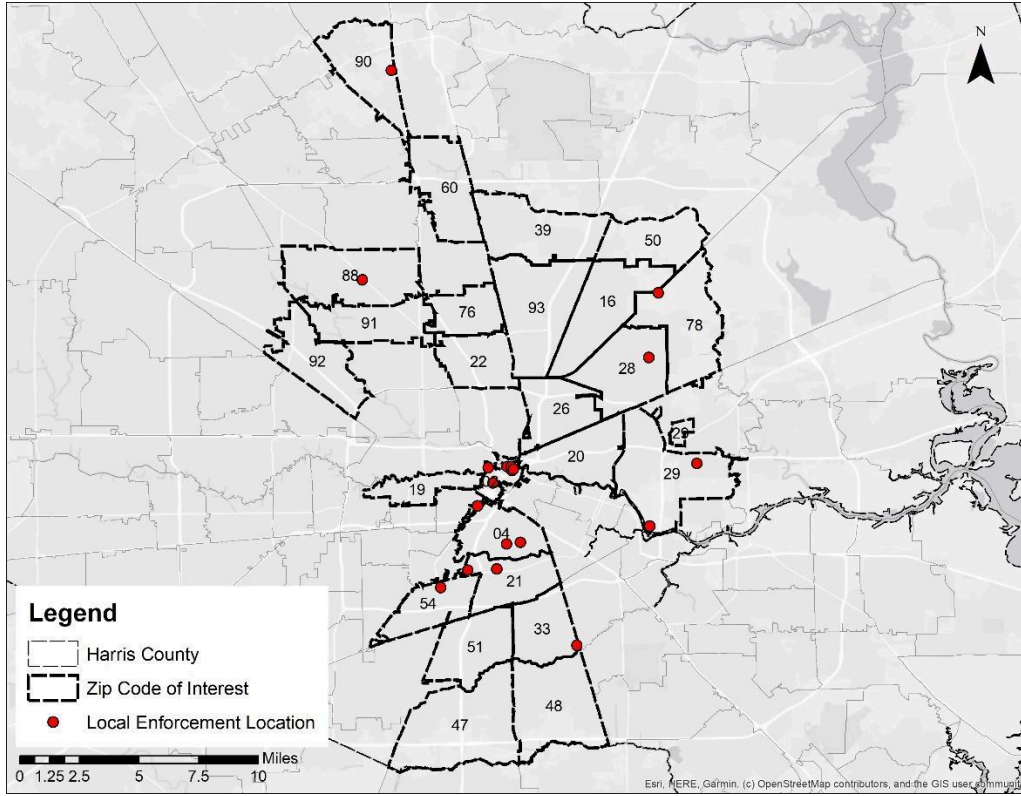
40

Community Assets

Critical community assets are valuable to the community during every step of the disaster management cycle. They are an essential component because their physical location can respond, shelter, house supplies, and beacon to the community. If these assets are harmed, communities could struggle during the recovery process. At the request of Charity Works, community assets for schools, places of worship, local enforcements, grocery retails, hospitals, and civic clubs were included in the mapping.

The Homeland Infrastructure Foundation-Level Data (HIFLD) data is a tool to get details on community assets. The HIFLLD dataset provides geospatial data that can be useful for community preparedness, resiliency research, and more [1]. Figures X to X display community assets' location within the 25 zip codes. More details about each community asset, such as an address, and names can be found in the appendix.
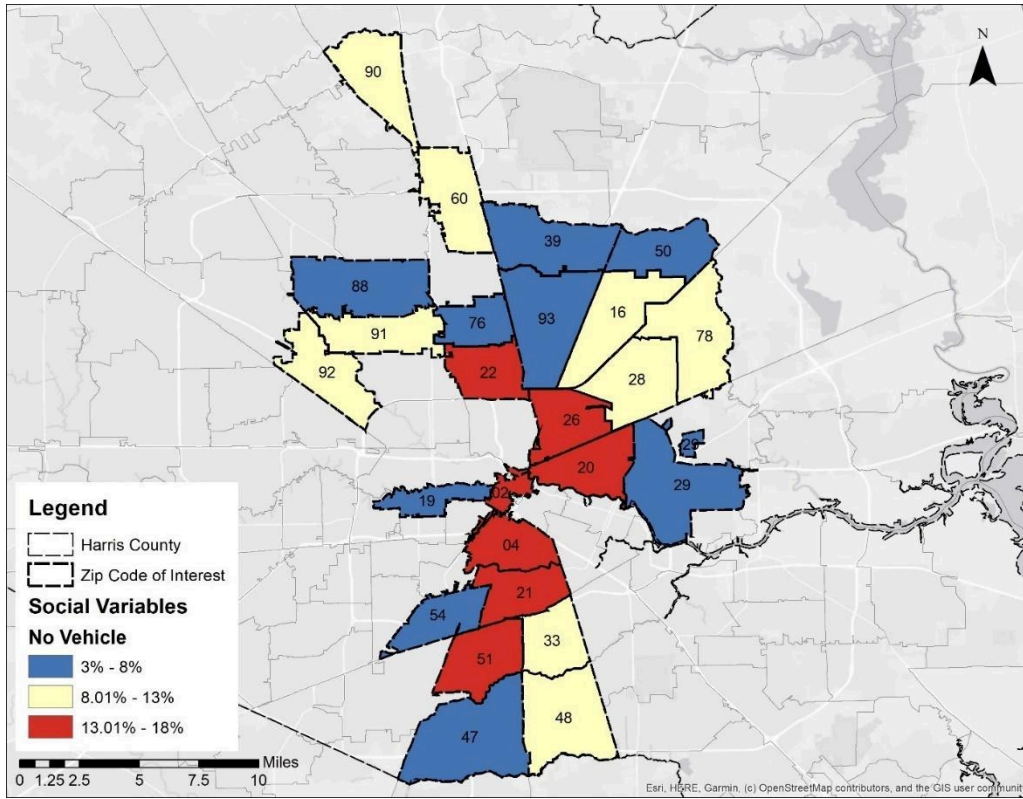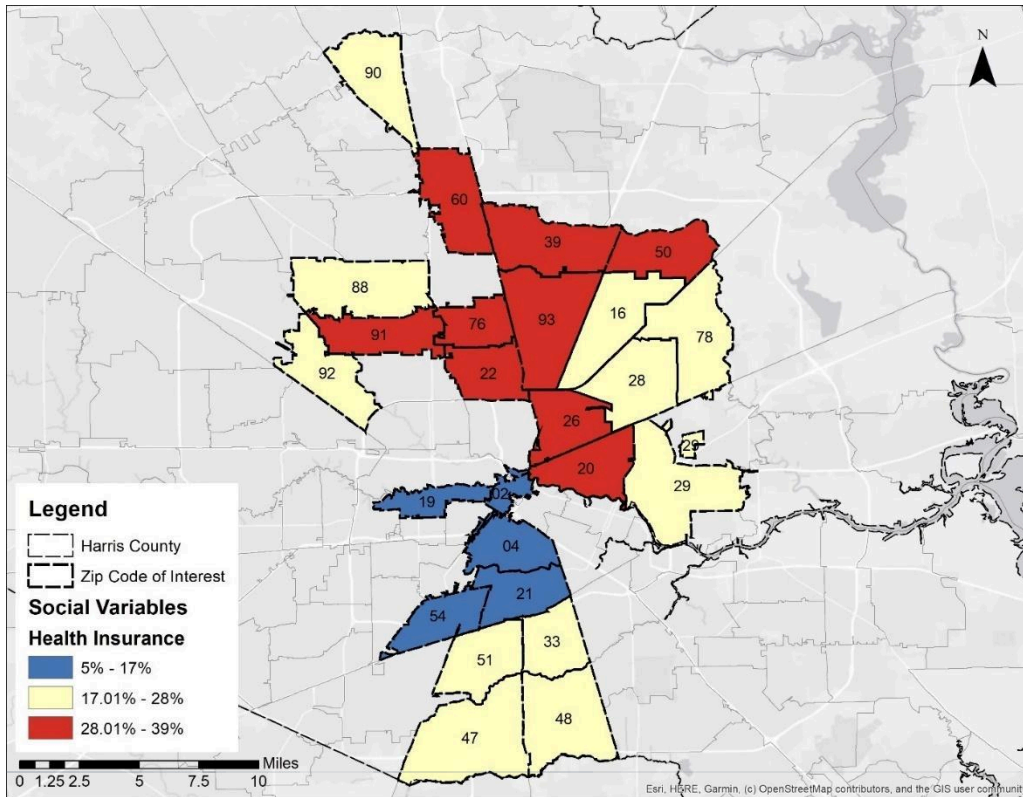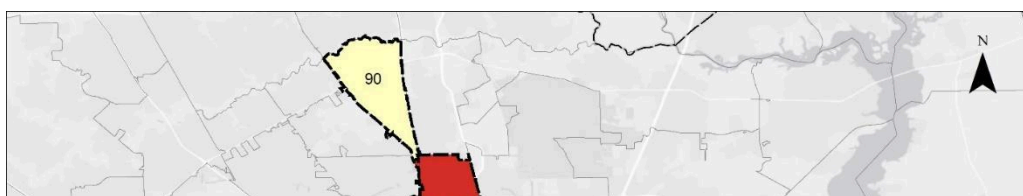
[1] HIFLD Open Data (arcgis.com)

Legend

- ⬛ Harris County
- ⬛ Zip Code of Interest
- 🟢 Private Schools

Miles
0 1.25 2.5   5   7.5   10

Legend
Harris County
Zip Code of Interest
● Local Enforcement Location

Miles
0 1.25 2.5   5   7.5   10

Legend
Harris County
Zip Code of Interest
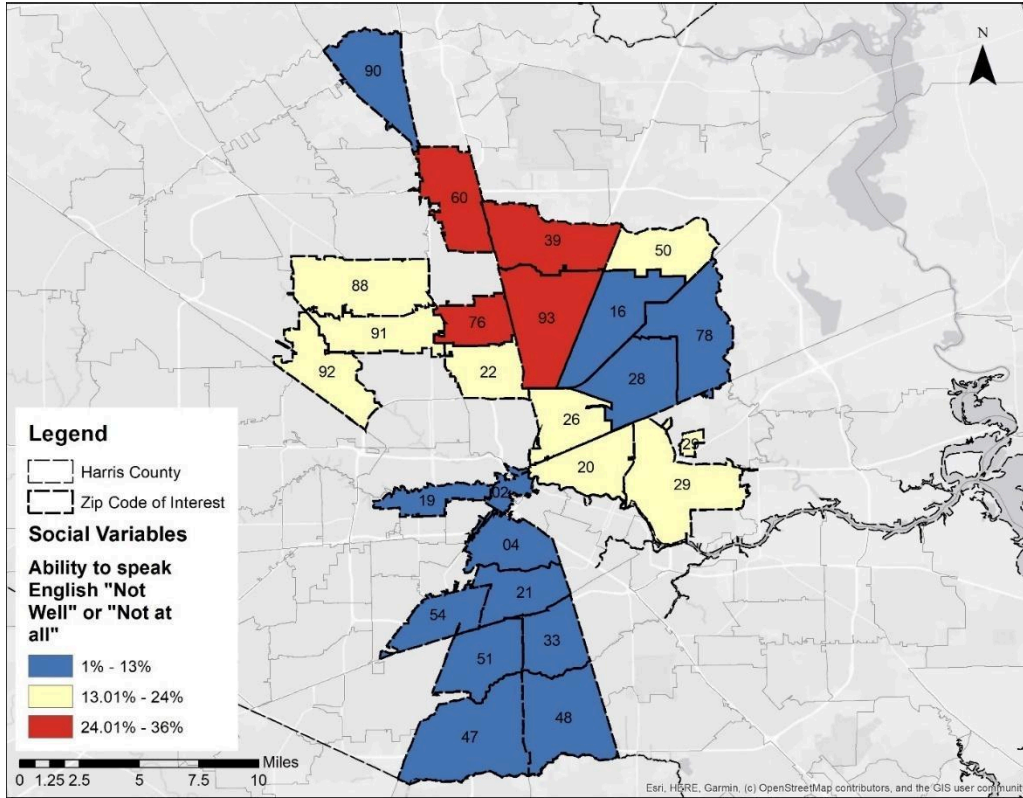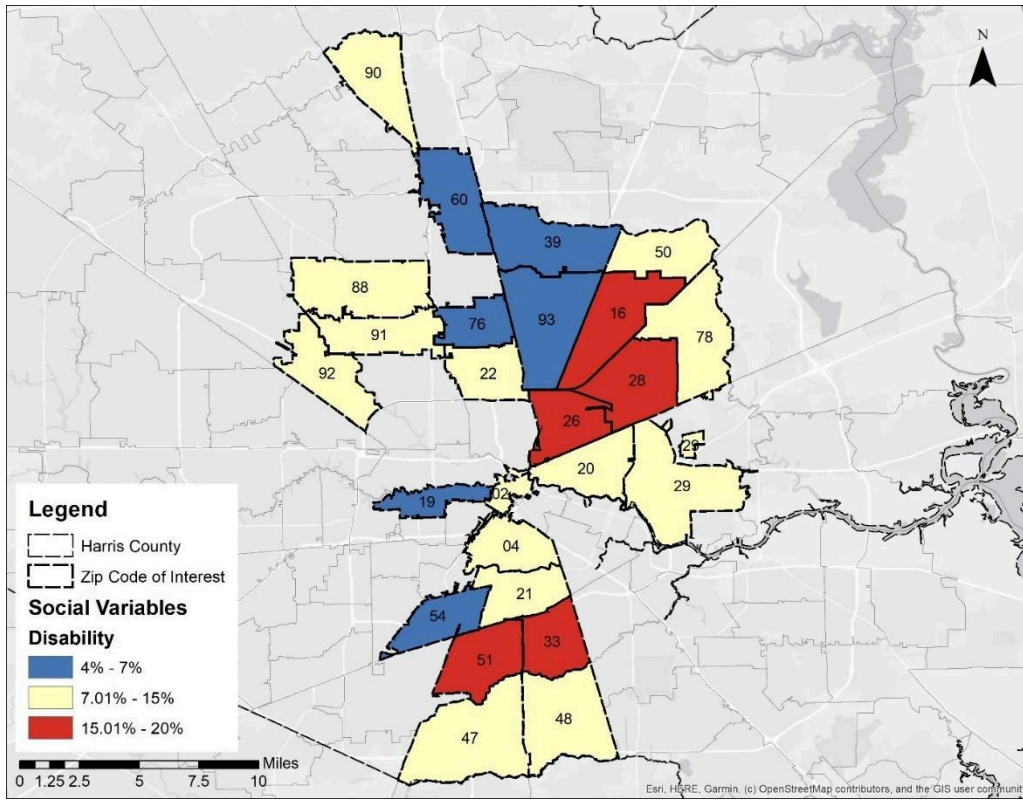● Places of Worship

Miles
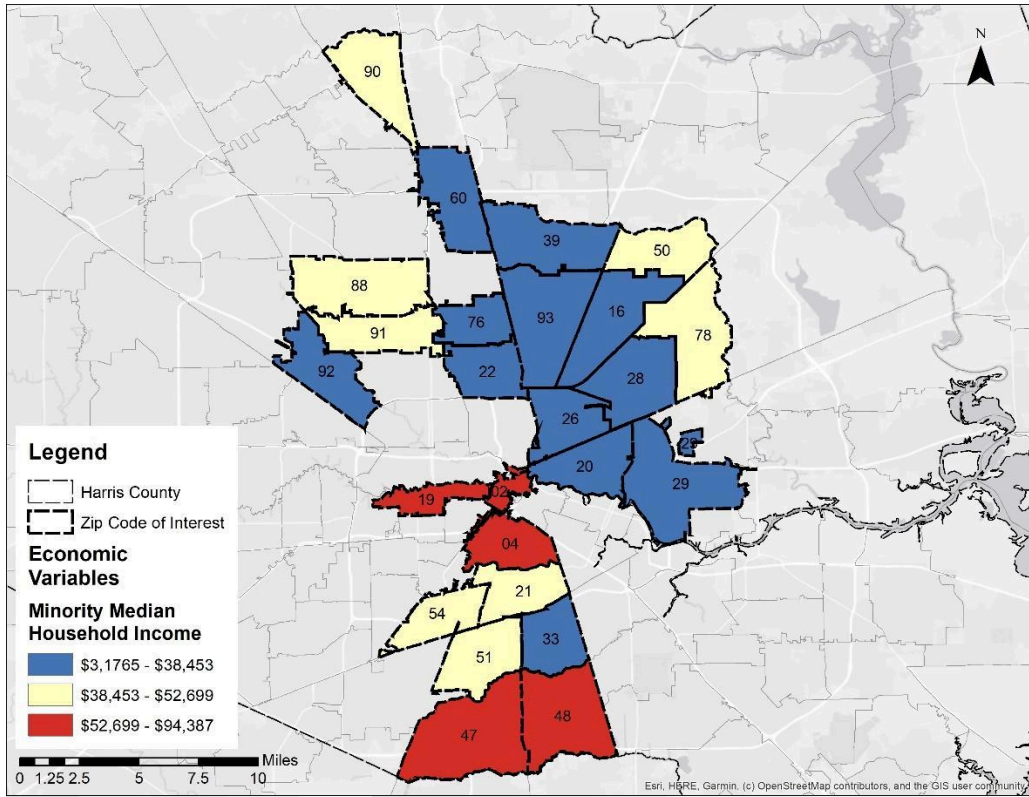0 1.25 2.5   5   7.5   10
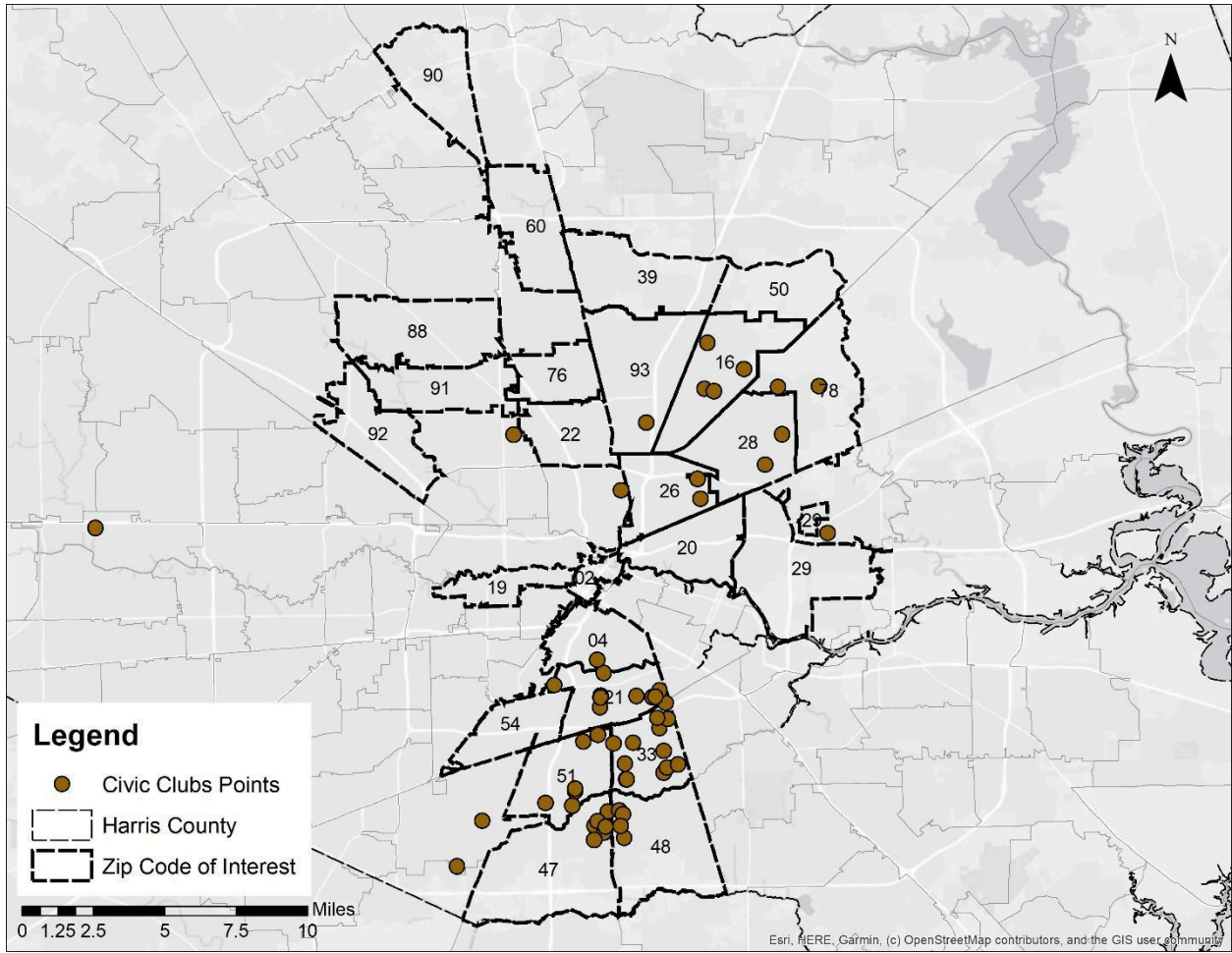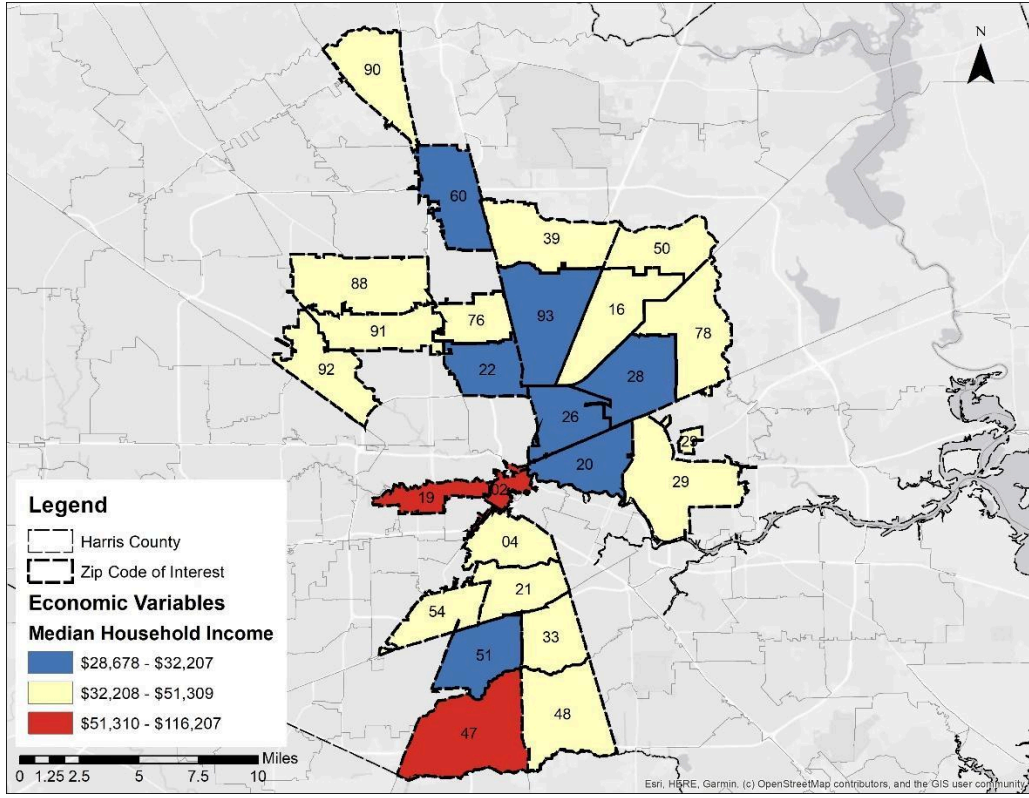
Appendix

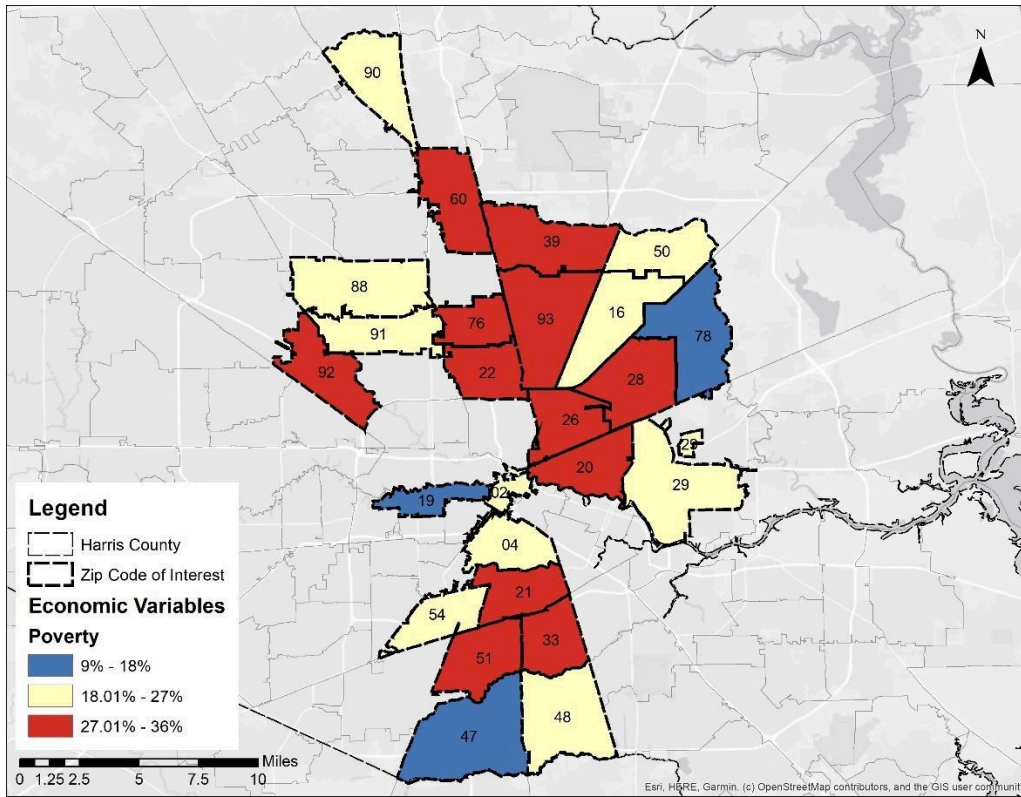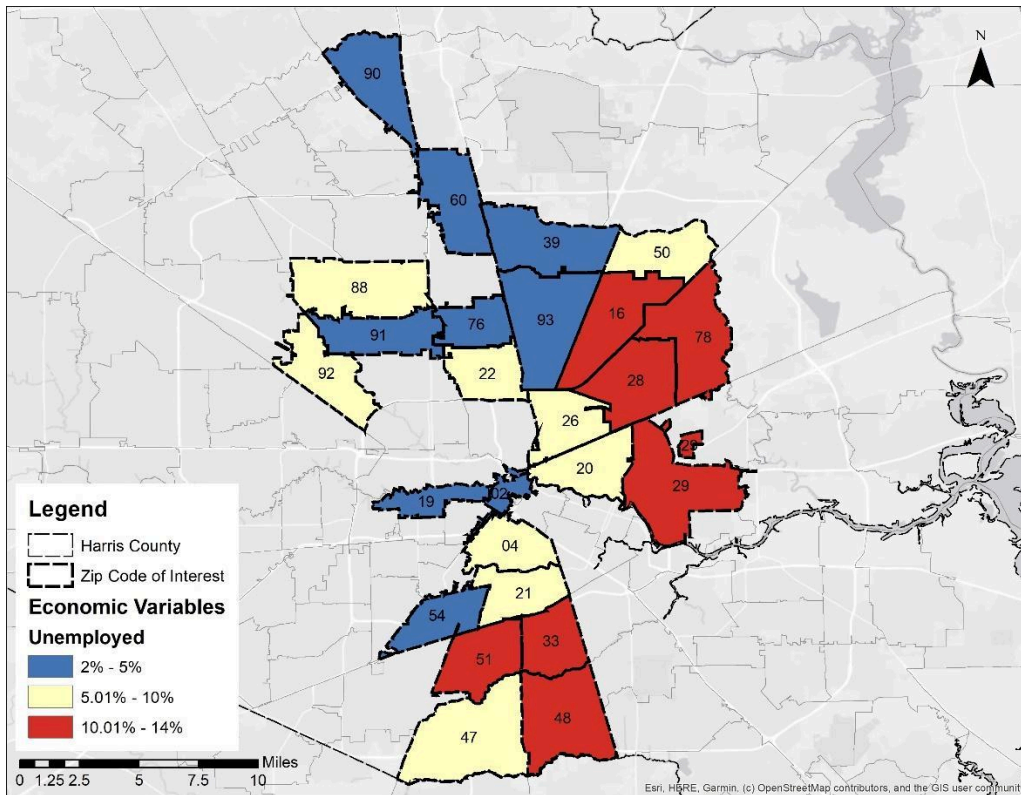FIGURE SEQ Figure * ARABIC 36 POPULATION WITHOUT VEHICLE ACCESS

FIGURE SEQ Figure * ARABIC 43 PEOPLE BELOW THE POVERTY LEVEL LINE

FIGURE SEQ FIGURE * ARABIC 45 HOUSEHOLDS WITHOUT
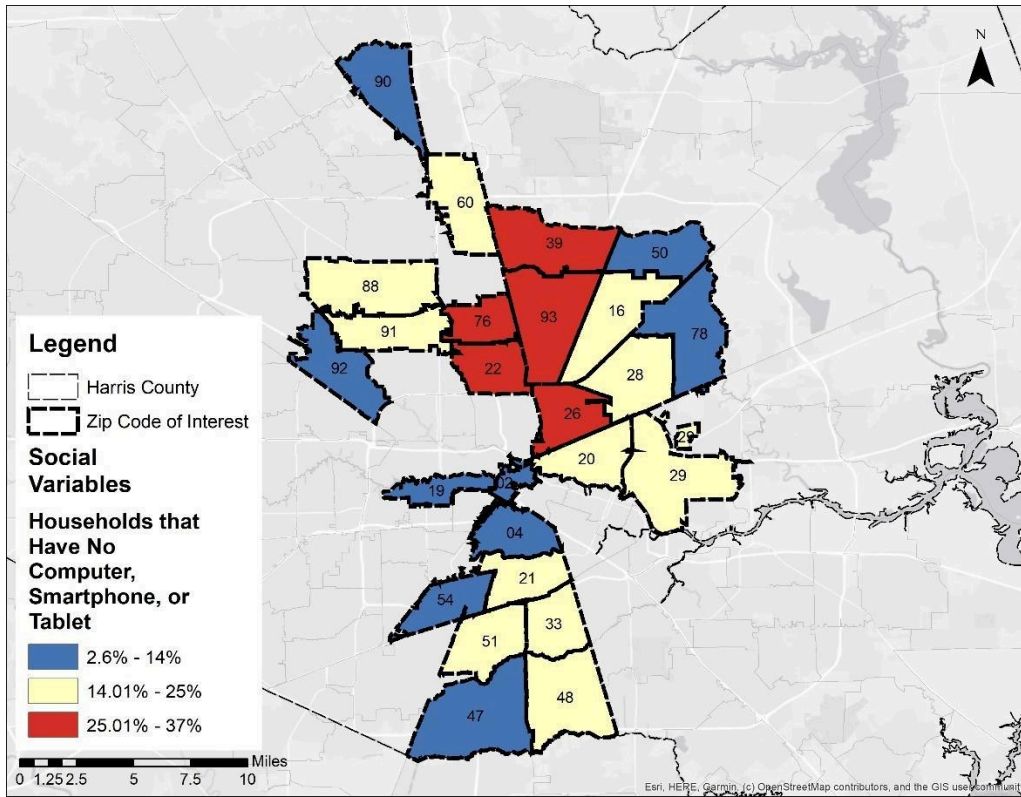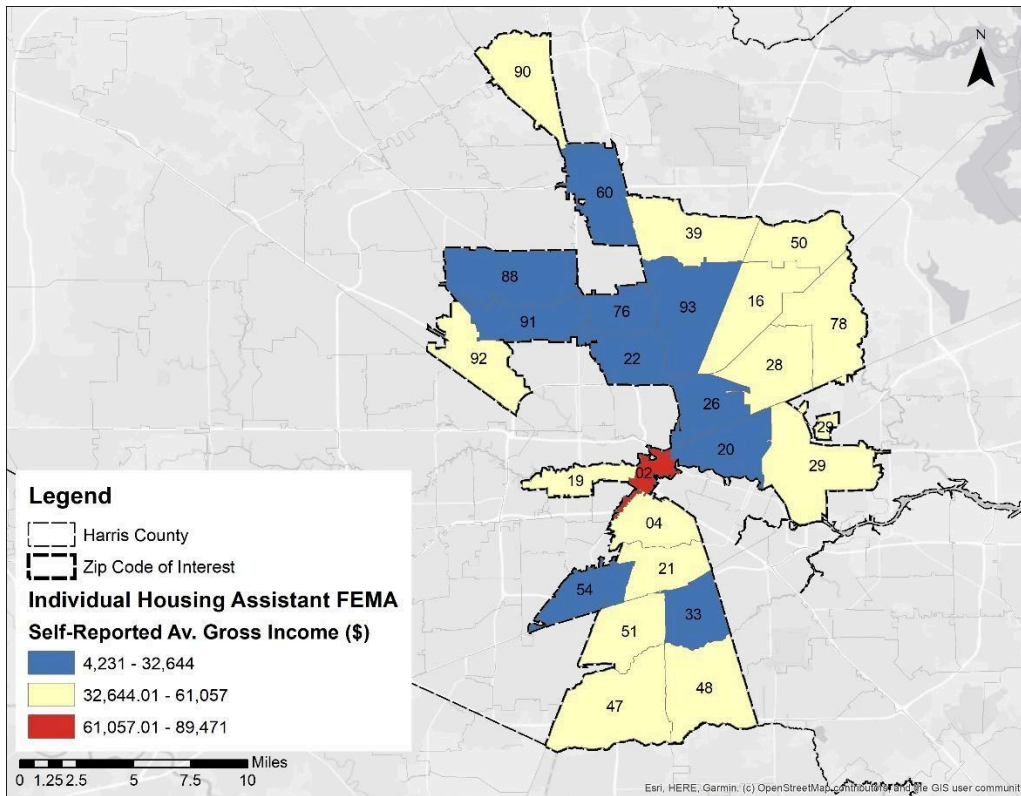COMPUTERS, SMARTPHONES, OR TABLETS

Legend

- ⬚ Harris County
- ⬚ Zip Code of Interest

Individual Housing Assistant FEMA

Rental Assistance Eligiblity

- 🟦 29 - 423
- 🟨 424 - 1,104
- 🟥 1,104 - 1,700

Miles
0 1.25 2.5   5   7.5   10

Esri, HERE, Garmin, (c) OpenStreetMap contributors and the GIS user community

Legend

- ⬚ Harris County
- ⬚ Zip Code of Interest

Individual Housing Assistant FEMA

Special Needs (Disability) Indicators

- 🟦 24 - 169
- 🟨 170 - 313
- 🟥 314 - 458

Miles
0 1.25 2.5   5   7.5   10

Esri, HERE, Garmin, (c) OpenStreetMap contributors and the GIS user community

Legend

Harris County

Zip Code of Interest

Individual Housing Assistant FEMA

Is the structure uninhabitable

- 0 - 2
- 3 - 4
- 5 - 6

Miles
0 1.25 2.5   5   7.5   10

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

Legend

Harris County

Zip Code of Interest

Individual Housing Assistant FEMA

Flood Insurance Indicator

- 38 - 181
- 182 - 462
- 463 - 761

Miles
0 1.25 2.5   5   7.5   10

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

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FIGURE SEQ FIGURE * ARABIC 57 IHA ROOF DAMAGE AMOUNT

Legend

- ⬚ Harris County
- ⬚ Zip Code of Interest

Individual Housing Assistant FEMA

Temporary Shelter Check In

- 🟦 23 - 197
- 🟨 198 - 372
- 🟥 373 - 547

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
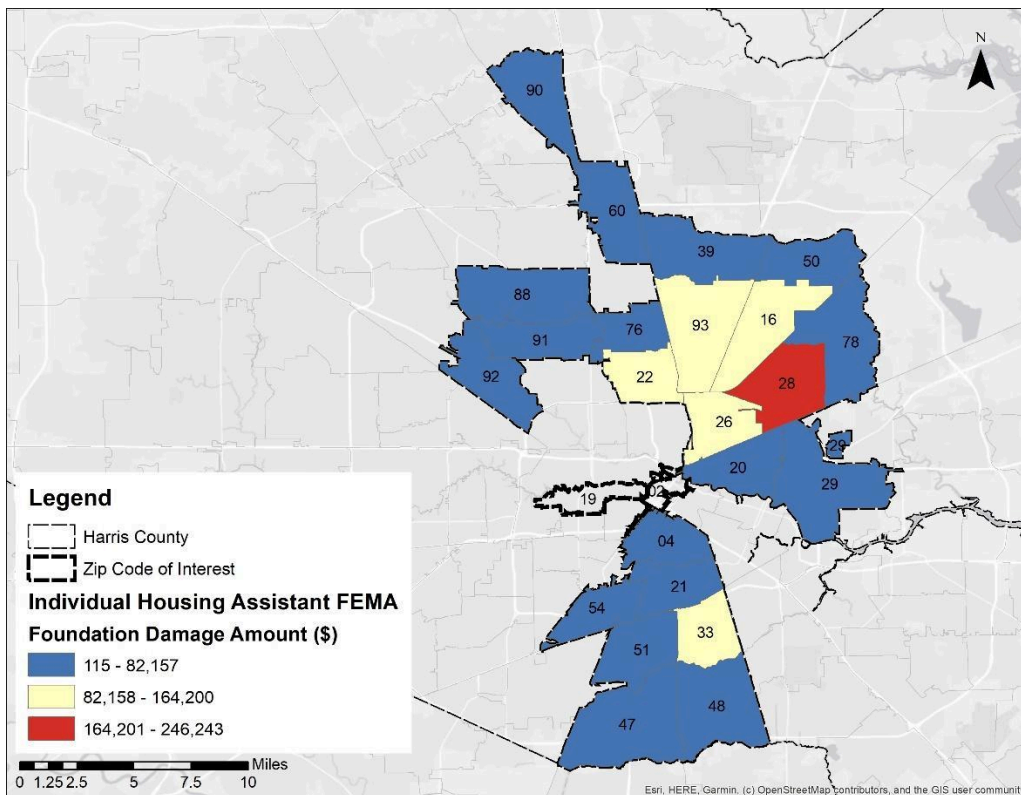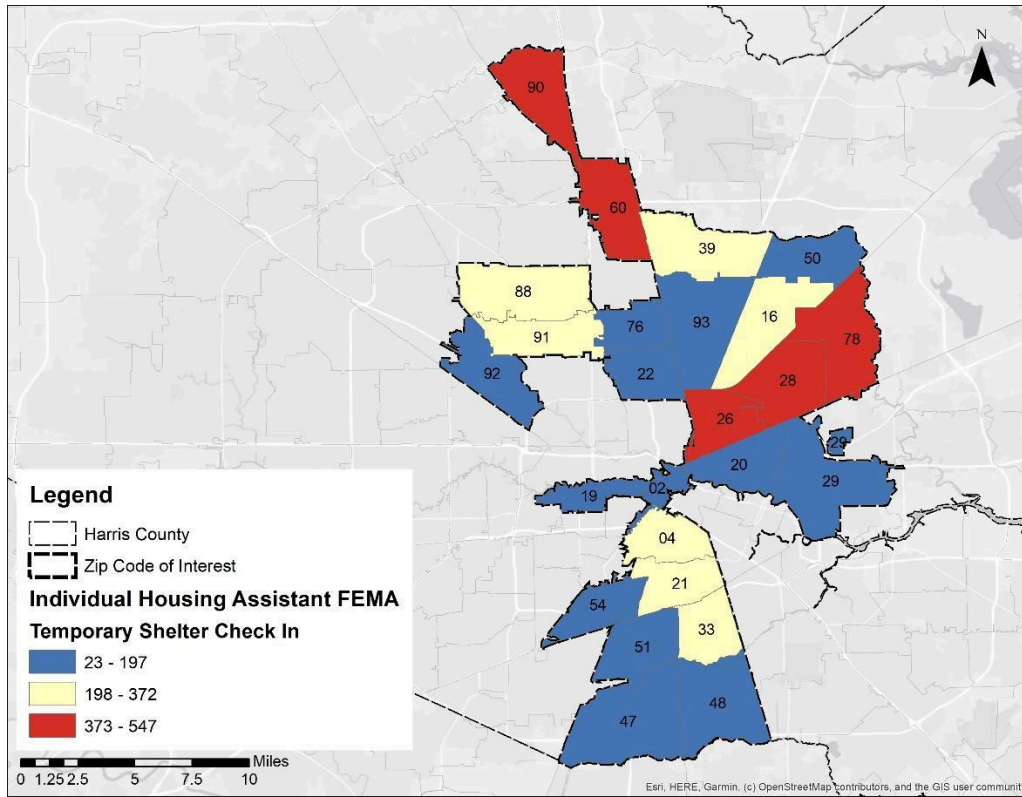
Zip Code	Civilian Population in Labor Force 16 Years and Over	Unemployed	White Alone, Not Hispanic or Latino 16 Years Old in Civilian Labor Force	Unemployed (White Alone, Not Hispanic or Latino)	Non-White 16 Years Old in Civilian Labor Force	Unemployed (Non-White)
02	5,552	5.6%	3,370	4.7%	2,182	7.1%
04	19,446	7.6%	6,492	4.9%	12,954	9.0%
016	13,138	14.0%	174	12.1%	12,964	14.0%
019	14,361	2.3%	9,840	2.0%	4,521	2.9%
020	11,124	8.3%	545	0.9%	10,579	8.7%
021	12,625	10.0%	1,767	2.5%	10,858	11.2%
022	12,280	6.8%	606	9.4%	11,674	6.6%
026	9,130	8.7%	236	8.9%	8,894	8.7%
028	7,471	13.3%	189	7.4%	7,282	13.5%
029	7,659	10.7%	713	10.4%	6,946	10.7%
033	12,412	14.1%	143	16.8%	12,269	14.1%
039	11,721	2.4%	630	2.5%	11,091	2.4%
047	17,746	8.3%	1,214	4.9%	16,532	8.5%
048	8,734	13.6%	342	7.9%	8,392	13.9%
050	2,059	10.1%	42	0.0%	2,017	10.3%
051	7,215	12.0%	217	4.6%	6,998	12.2%
054	14,679	4.0%	3,989	2.9%	10,690	4.4%
060	20,229	4.5%	955	0.9%	19,274	4.7%
076	15,818	3.1%	684	5.8%	15,134	3.0%
078	6,636	10.8%	328	27.4%	6,308	9.9%
088	25,913	8.2%	1,459	7.7%	24,454	8.2%
090	21,143	5.2%	3,576	1.7%	17,567	5.9%
091	12,878	5.0%	1,296	2.1%	11,582	5.3%
092	20,467	6.8%	4,884	5.6%	15,583	7.1%
093	18,454	4.8%	901	12.3%	17,553	4.4%
TOTAL	328,890	7.3%	44,592	4.2%	284,298	7.8%

Table 10 Unemployment by Race

Zip Code	Household without Internet	Households that Have No Computer, Smartphone, or Tablet
02	9.6%	7.2%
04	18.5%	12.9%
016	25.1%	19.0%
019	6.0%	2.7%
020	27.1%	21.2%
021	24.0%	17.9%
022	41.9%	33.9%
026	41.4%	30.2%
028	29.9%	19.4%
029	28.0%	20.2%
033	26.9%	16.5%
039	39.6%	34.0%
047	9.2%	7.3%
048	21.3%	15.8%
050	18.4%	12.1%
051	31.5%	22.0%
054	6.2%	2.6%
060	29.9%	19.6%
076	39.3%	36.1%
078	19.2%	11.9%
088	22.5%	15.1%
090	15.9%	6.1%
091	25.6%	18.6%
092	16.4%	11.4%
093	44.9%	37.2%
TOTAL	24.3%	17.6%

Table 11 Households without Internet or Computer

Summary –Not the end this is the next step to volume 2

From Here Down trying to figure out where it goes

Charity Productions' self-funded evidenced-based patchwork of coordinating existing lessons learned and specific proven strategies offers additional tools in the reverse engineering toolbox. Innovative proof of concept and demonstration projects will provide recipes of success. Amending a fractured, and disconnected service delivery system littered with status quo detractors can be converted. Practitioners know the need for innovative and aggressive approaches with instructional core operational methodologies based on scientific formulas, with sustainable processes that mitigate threats and accelerates the recovery process.

The focus of this report is to avoid viewing these communities outside of the lenes of a burden, rather viewed as an untapped repository of resources and information at the ready to be activated.

In addition to the needs of communities within the footprint, there also exist **ASSETS.** Assets untapped or positioned strategically as invested partners. Instead of being cataloged as collateral damaged goods.

Individuals who possess interest, skills, and abilities in which they are willing to contribute towards the development of the community, is an asset. Applying a Community Based Participatory Research approach as a resource will ensure projects are feasible and concise to mitigate disparities.

- According to Dr. Robert D. Putnam, Bowling Alone – The Collapse and Revival of American Community, Dr. Putnam is a Harvard Professor.
- According to Susan Rogers' research in Sunnyside a, Context for Change, Susan Rogers is an Associate Professor University of Houston and Director of the Community Design Resource Center, discovered that 22 million dollars leaves Sunnyside is a neighborhood in southeast Houston and zip codes 77052, 77047, & 770033. This is a prime example of predatory practices diverting money and services out of the neighborhood.

Community Measurement Science Fields of Opportunities is our new umbrella. Full of reverse engineering, multi-level marketing, rebranding of thinking, producing added value, and clearer understanding from lessons learned.

What's inside the toolbox? Can people produce lubrication where there is friction, nurture better ideas and outcomes? What can we expect from the **" Houston's Big Body of Politics" ?**

Focusing: Reassessing and Leveraging and Framing Human Capital, an Asset

2013, Charity Productions began a series of field data collection processes targeting 25 zip codes labeled with many negative characterizations. We used a GIS map created by the City of Houston Health Department related to Clusters of Vulnerable Populations in Houston as part of the baseline. Predatory language encourages predatory practices by local jurisdictions, thus widening the disparity gaps.

- Local jurisdictions not designed to reduce negative outcomes
- Citizens limitations with engaging in the public policy and advocacy formulas
- After a 100 years lack of trust
- Providers silo operations that morph into a limited referral network
- Citizens battle fatigue from attacks by predators from all quarters inundated with unfulfilled political promises and school closings

In this report, Charity Productions serves as a community outreach organization to advocate the needs of underrepresented groups in vulnerable communities. Texas Target Communities (TTC) serves as an outside agency in an academic-community partnership with Charity Productions to collectively work together to address issues identified in the footprint. Charity Productions collected primary data from the communities throughout the zip codes of interest and TTC analyzed the data to identify their main concerns and needs to be addressed. Solutions: Leveraging Existing Frameworks and Human Capital

The focus of this report is to avoid viewing these communities in the perspective of being a burden of a problem to solve, but to recognize the is existing assets that can be utilized as resources to fill in disparities in order to find solutions that will directly serve the needs of residents. Leveraging Community Capital to Find Solutions According to Mayor Sylvester Turner's vision to "create complete communities" we must utilize the existing assets within these communities to create feasible neighborhood improving projects. Assets can be identified as capabilities available through local government, local organizations, or institutions. Individuals who possess interest, skills, and abilities in which they are willing to contribute towards the development of the community14 in this section, we will identify assets existing within the footprint and services available outside the footprint to leverage as resources to implement neighborhood improving projects to reduce disparities in vulnerable communities. Federal Public Policy mandated by The Presidential Policy Directive in 2003.

Footnote:

14 Lionel J. Beaulieu (1995). Mapping the Assets of your Community: A Key Component for Building Local Capacity. Southern Rural Development Center 15 Presidential Policy Directive PPD-8, https://www.dhs.gov/presidential-policy-directive-8-national-preparedness

This report has three major sections with a conclusion being the fourth section. This report is also aimed at empowering stakeholders with the skill sets to substantiate rational positions papers concerning the decades of selective tax pawers equity in service delivery.   at stakeholders are aiming at reminding scholars to venture out beyond the mind bunkers of timidness status quo and step onto the global stage of new knowledge and rigor. Hopefully, this will contribute to a 21century of model of scholarly doers. Reimaging the enthusiastic moments when a problem is solved, or a mystery revealed.   At the current rate of resolutions, and predictions history may record our efforts as unfavorable until and unless we increase the solution pools for the underserved. We have past the sixty- year mile marker of unresolved issues. COVID 19 virus demonstrated, it can be done if we have a common goal for common needs, there is hope! A new generation of new knowledge practitioners at all levels are becoming visible.

The third world conditions are substantially visible in black and poor neighborhoods designation until a new land development project is funded in the same area. There is much space for accusations of malpractice, incompetence, increasing predatory behaviors, corruption, and cover-ups. These occurrences are well documented, particularly in areas with a history of poverty or where under educated people reside. This report offers victims, researchers, and the political class, some a fresh look through the eyes and experiences throughout various institutions and agencies.   We want to improve tax-based service delivery and reduce service gaps and disparities.
Conclusion Notes 1

labeled that have evolved to predatory responses to people in labeled poor, black, underserved, or vulnerable.
A condition spanning sixty-years requires the same level of cooperation to reduce long standing disparities, in our demonstration project are
to system and product processing protocols during this pandemic. Conversely, COVID 19, exposed the underbelly and fractured sides of tax-based service delivery flaws.

This report will act as effort to contribute strategies designed to improve the tax-based delivery system as well as the private sector in some cases.

 repository of experiences, trainings, interviews, programs, projects, and research presented by Charity Productions. Core elements in this quest to improved service delivery are injustices that are codified as procedures and practiced fair. on people labeled poor, black, marginalized and many other related designations. These and other negative terms has grown into a system of accepted practices full of injustices and disparities that have become full grown The techniques, lessons learned, and subject matter insights are in a time of modern message systems connected decades of

Abstract. An abstract is a concise summary of an experiment or research project. It should be brief -- typically under 200 words. The purpose of the abstract is to summarize the research

paper by stating the purpose of the research, the **experimental method, the findings, and the conclusions**.

compound crisis and unfulfilled political promises.

pivot port service assembly network for tax-based and private sector delivery systems. game changing proclamations into platforms of improved tax-based service delivery and bottom-up sustainable messaging systems. that we introduce an innovative approach using scientific principles that will tap untapped community capital. A good description is reverse engineering unmitigated and on-going threats. After decades and oceans of research with billions of dollars of funding, the disparity rates are consistently widening. Therefore, adhering to the volumes of case studies, and reports we summarize a common recommendation is better narratives that produces better outcomes. COVID 19, got everyone's public health and safety attention. Reverse engineer untapped human, social and community capital.

- The measure of our scholarship must be compared to the rate of decline and control of the problem.
- The effectiveness of our scholarship must be compared to the expanse of the distribution of programmatic generational usage of in some cases new practices.
- The contained in the application of the techniques. that will increase citizen capacity to respond and transform untapped human community assets, into skilled invested indigenous assets.
- The quality and longevity of our scholarship and innovativeness must be compared to the functionality of the rate of generational acceptances by citizens.

Solutions: Leveraging Existing Frameworks and Human Capital The four themes presented in this section represent the disparities present throughout the zip codes of interest. All the data shown is relevant to serve as indicators to which they contribute to the reoccurring problems in these vulnerable communities. There is a significant amount of data indicating a distinguishable set of disparities present within the footprint to acknowledge and recognize as a problem that needs to be addressed. The problems needed to be addressed are as follows in correlation to the data provided: