

April 2020

# Floodway Buyout Strategy for a Resilient Houston

A Systems Approach to Breaking the Dangerous and  
Expensive Cycle of Rebuilding in the Floodway

Erica Vilay, Master in Public Policy Candidate, 2020  
Phil Pollman, Master in Public Policy Candidate, 2020



**Prepared for**  
Offices of Recovery and Resilience,  
City of Houston

**Advised by**  
Professor Juliette Kayyem  
Professor Julie Boatright Wilson  
Professor Christopher Avery

*Submitted in partial fulfillment of the requirements for the degree of Master in Public Policy. This Policy Analysis Exercise reflects the views of the author(s) and should not be viewed as representing the views of the PAE's external client(s), nor those of Harvard University or any of its faculty.*



**Front Cover:** Residential neighborhoods near the Interstate 10 sit in floodwater in the wake of Hurricane Harvey on August 29, 2017 in Houston, Texas. (Marcus Yam / Los Angeles Times via Getty Images)

**Above:** Debris from inside homes hit by Hurricane Harvey (©AdobeStock)

## About this Policy Analysis Report

This policy report was developed by two public policy graduate students as part of their Policy Analysis Exercise, in partial fulfillment of the requirements for the degree of Master in Public Policy from the John F. Kennedy School of Government at Harvard University in Cambridge, Massachusetts.

This document was developed over an academic year, October 2019 to April 2020, for the Offices of Recovery and Resilience at the City of Houston. The findings, analysis, and recommendations were developed through an in-depth literature review and interviews with public servants and academic experts. This report builds directly on the work of the Office of Resilience and the Office of Recovery's recent publications, "Living with Water" and "Resilient Houston 2050 Strategy."

The field of climate adaptation and managed retreat is new, requiring urgent research and testing through applications. We hope that this report will contribute a small part to that body of work for local governments like Houston to best protect their citizens and natural environments against climate change, the greatest existential threat of our lifetimes.

We would like to thank our advisors for challenging, supporting, and guiding us. Thank you to the HKS Environment and Natural Resources Program and the Belfer Center for Science and International Affairs for awarding us a research grant to make this report possible. Most importantly, we would like to thank our families for their love and support – for always being our life rafts against rising tides. Thank you.

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# Executive Summary

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## Climate Change and Extreme Weather Events in the City of Houston

Houston, Texas, America's most diverse and fourth-largest city, is the most flooded city in the United States. Nicknamed Bayou City, Houston is crisscrossed by 22 watersheds and sits atop a low-lying prairie just 26 feet above sea level. Houston's geography and urban planning make flooding and water damage a constant threat. Houston is also the largest city in the U.S. without a zoning ordinance code, though it does have land-use restrictions. The upstream development of Houston and the downstream erosion of the coastline has only worsened the ability of watersheds to drain, causing the dangerous, costly, and repetitive flooding of structures closest to the bayous.

Intense rain and hurricanes, the primary environmental destructive forces for the city, are increasing in frequency and intensity. In the past five years, Houstonians have experienced the devastation of six federally-declared flooding disasters, including three "500-year" floods in three years. During Hurricane Harvey in 2017, a full one-third of Houston was underwater, causing the deaths of 68 Texans and \$130 billion in damage.

The structures, policies, and tactics of disaster recovery today are not preparing the City of Houston for the increasingly costly events of tomorrow. In the face of increasing numbers of extreme weather events, Houston cannot continue to rebuild in the same way. In February 2020, the Houston Mayor's Office of Resilience published "Resilient Houston," a long-term resilience plan for adapting to the effects of shocks and stressors, including climate change and extreme weather events. To achieve healthy and connected bayous, an integral part of Houston's resilience, the plan aims to clear the floodway of all habitable structures by 2030.

## **Current Approach: Opportunistic Buyout Program**

An effective buyout program, in which the government purchases property from private citizens, is the only way to break the cycle of destruction and rebuilding. Buyouts in the floodway have many compelling benefits, most importantly permanently relocating families to safer, less flood-prone areas. Houstonians receive \$7 in benefits for every \$1 invested in buyouts. However, adding to the complexity and perhaps fueling distrust of the government, the U.S. and Houston have a history of using relocation and development to displace and consolidate non-white communities.

Residents in Houston's floodway are trapped in a reinforcing feedback loop, in which they are always incentivized to rebuild within the floodway instead of relocating permanently to safety. The case for not participating in a voluntary government buyout program is rational when compared to the most competing offers to rebuild or sell to developers. Without government intervention, people will predictably continue the cycle of rebuilding in the floodway.

Multiple entities in the Houston area have established buyout programs, but they are complex, slow, and do not attract the levels of participation necessary to match the scale and urgency of the flooding. Given the historical buyout capacity of the Harris County Flood Control District, it would take nearly 60 years to buy out all the floodway properties that the City wants relocated by 2030.

## **Recommendations: Buy-in/Buyout (Strategic and Managed Retreat)**

Houston must move from an opportunistic buyout program happening at multiple agencies to an integrated and scaled-up "buy-in/buyout" program that includes a relocation strategy at the forefront. The buy-in/buyout process means including community participation in and endorsement of relocation plans. Strategic and managed retreat therefore becomes not only a flood reduction responder, but also a tool for achieving Houston's larger social, economic, and resilience goals.

Our thirteen recommendations build upon the City's current competencies to help the City of Houston meet its 2030 goal of clearing the floodway of all habitable structures. Each recommendation is supported by case studies from around the U.S., including the massive buyout program conducted after Superstorm Sandy. The actions are sequenced by the first six months (Governance), months six through eighteen (Programs), and the following twelve months (Policy Reform). Lastly, an example of the strategy is applied to the Greenspoint Neighborhood in North Houston to envision how the plan would operationalize.

Houston has a commitment to re-build differently – to adapt to the demands of a changing climate and prioritize human flourishing for all residents before the next flood comes. We hope this report proves useful to the City as it builds toward a future that is equitable, prosperous, and accessible for all.





*The consequences of the spill Buffalo Bayou River in Houston.  
Flooded park on Downtown city background from Hurricane Harvey (©AdobeStock)*



# Houston Snapshot

## Addressing the Increasing Climate Threats to Bayou City

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The City of Houston is an administratively independent city within Harris County. At 2.3 million people, Houston is the nation's seventh-largest metropolitan area and fourth-largest city. In addition to being the "Energy Capital of the World," Houston is known for its deep-water seaports, growing life sciences industry, the world's largest medical center complex, and the nationally-important NASA Johnson Space Center. The city also follows the Texas tradition of being one of the most business-friendly markets, with low unionization rates, no state or corporate income taxes, and no standardized zoning development laws. Houston has one of the youngest, fastest-growing and most diverse populations anywhere in the world; 29.1% of Houstonians are foreign-born.

The geography and urban planning of Houston make flooding and water damage a constant threat, as the city was built atop a low-lying prairie just 26 feet above sea level. Intense rain and hurricanes are the primary destructive forces for the city. The flat city is crisscrossed by twenty-two watersheds, comprised of bayous (slow-moving rivers) and their floodways, running 25,000 miles. A floodway is an area adjacent to a bayou, where water flow is concentrated and moves at high velocity (Mayor's Office of Resilience, 2020). Water drainage is made more difficult by sea-level rise in the nearby Galveston Bay, and Houston historically receives about one major hurricane per decade from its position on the Gulf of Mexico.

Houston is also the largest city in the U.S. without a zoning ordinance code, though it does have land-use restrictions. The upstream development of Houston and the downstream erosion of the coastline has only worsened the ability of watersheds to drain, causing the dangerous, costly, and repetitive flooding of structures closest to the bayous.

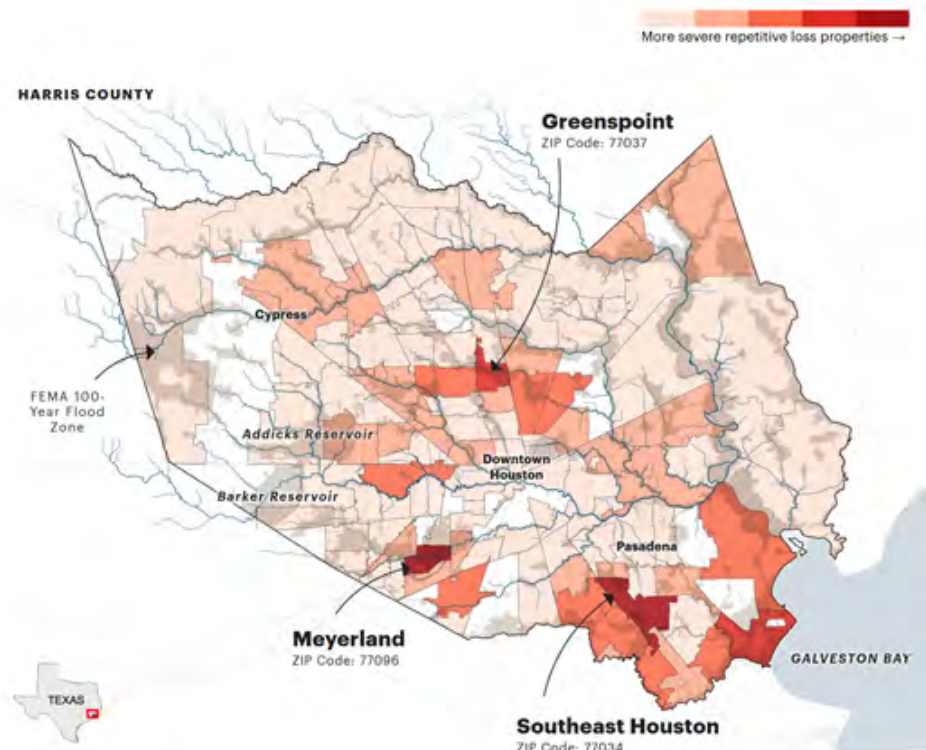
Riverine flooding, hurricanes, and sea-level rise are the primary climate threats to Houston. Over the last twenty years, Houston has experienced an average of five days of flooding per year, making it the most flooded city in the United States. More recently, Houston has experienced six federally-declared emergency storms in five years (Halloween 2015, Memorial Day 2015, Tax Day 2016, June 2016, Hurricane Harvey 2017, Tropical Storm Imelda 2019), including three "500-year" floods in three years. Due to the crisscrossing nature of the bayous, flooding in Houston is not limited to just waterfronts, but affects many areas across the city. Properties in the floodway are especially subject to dangerous and repeated flooding.



Flooding in Houston is some of the country's most repeated and most expensive. Data from the Federal Emergency Management Agency's National Flood Insurance Program (NFIP) lay out the magnitude of damage costs for Houston. Of the U.S. Federal Emergency Management Agency list of Severe Repeated-Loss Properties (SRLP) [1], Harris County has the most payouts in years spanning 1975-2015, pre-Hurricane Harvey. The largest number of claims on a single structure is 40 payouts to rebuild. Of about 30,000 designated SRLP properties across the U.S., nearly five thousand are in Texas, the second-highest of any state (after Louisiana). The total number of NFIP paid losses for SRL properties in Houston is 10,321, the largest of any area in the U.S. The total of NFIP payments for SRL properties in Houston is \$196 million, also the largest total of any area in the U.S. (Pinter et al., 2017)

## Severe Repetitive Loss Properties in Harris County (1978-2015)

Source: FEMA data obtained by NRDC (Moore, 2017)



Hurricane Harvey, which made landfall on August 25, 2017, was a major turning point for the city. With peak accumulations of over 60 inches of rain, the category four storm produced the most rain on record for a weather event in the contiguous United States and caused an estimated \$130 billion in damage (Smith & NOAA National Centers For Environmental Information, 2020). At least 68 fatalities in Texas alone were directly attributable to this event, the highest death toll due to a tropical system in that state since 1919 (Murphy, 2018). At the peak of the five-day storm, a full one-third of Houston was underwater, with more flooded homes than in New Orleans during Hurricane Katrina or New York City during Hurricane Sandy. Hurricanes Harvey and Katrina are the most expensive natural disasters in the history of the United States. The storm also caused first-time flooding for many residents, bringing the attention of a much wider audience to this critical issue.

[1] Defined as a family property that has had four or more claims of more than \$5,000 or two to three claims that cumulatively exceed the building's value (Flood Insurance Reform Act of 2004)

In addition to the immediate structural costs, Harvey inflicted long-term psychological costs. A recent study by Rice University found that “nearly 20% of flood victims in the study reported post-flood PTSD, depression and anxiety, and more than 70% of survey respondents said the prospect of future flood events was a source of worry” (Boyer, 2019).

Storms are only increasing in severity: climate change made Hurricane Harvey’s rainfall 15% more intense and made the extreme rainfall three times more likely to occur (Oldenborgh et al., 2017). Rainfall amounts that were previously classified as 100-year events in Houston are now much more frequent 25-year events, according to Atlas 14, NOAA’s most updated analysis of precipitation (O’Leary, Maureen, 2018). The damage from these storms will likely also intensify, exacerbated by population increases and property development on vulnerable land near the bayous.

Significantly, the economic and social impacts of climate change are not distributed evenly. Areas with higher social vulnerability, a measure developed by the Centers for Disease Control, are more likely to lack the resources to prepare for and recover from a disaster. In the 59 Census tracts identified as “highest risk,” for example, 31,000 families lost more than half of their annual income after Hurricane Harvey (Civis, 2019). Hurricane Harvey also destroyed over half of Houston’s affordable housing stock (Mayor’s Office of Resilience, 2020). Because under-resourced groups such as low income, non-white, undocumented, older, or disabled people begin with fewer resources, recovering from a disaster can be particularly challenging.

In February 2020, the City published “Resilient Houston,” a long-term resilience plan for adapting to shocks and stressors. A resilience goal for the City is to remove all habitable structures from the floodway by 2030. Buyouts, in which government entities purchase property from private citizens, are an example of an effective climate adaptation program [2]. Not only is a buyout safer for families, but the one-time cost also reduces the subsidized cost of repairing repeated structural flood damages, restores the land to absorb stormwater, and opens the possibility of community amenities including parks and fields. Though studies need to be conducted to specify the exact number, we conservatively estimate that there are about seven thousand habitable units in Houston’s floodways, with 6,174 documented multi-family units (GHFMC, 2019a).

The structures, policies, and tactics of disaster recovery today are not preparing the City of Houston for the increasingly costly events of tomorrow. In the face of increasingly extreme weather events, Houston cannot continue to rebuild in the same way. The approximately seven thousand habitable structures in the floodway must be relocated by 2030, in conjunction with Houston’s larger resilience vision.

[2] Climate adaptation programs differ from climate mitigation programs, which reduce carbon emissions to slow the climate crisis. In contrast, adaptation programs help cities and people adjust to the effects of climate change. Examples of climate adaptation policies include reinforcing and further developing hard infrastructure, incentivizing green infrastructure, restoring the natural floodways, and developing water detention basins.

# Current Policy Intervention

## Traditional Buyout Program

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An effective buyout program, in which the government purchases property from private citizens, is the only way to break the cycle of destruction and rebuilding. Residents today are not incentivized to participate in buyout programs because of the low cost of rebuilding, long lead times, competing offers, and uncertainty about where to move next. The current approach of multiple departments opportunistically attempting buyouts has not attracted the level of buyout participation necessary to match the scale and urgency of the flooding. The core capabilities of buyout programs today are the acquisition of properties and the restoration/development of green infrastructure, with little-to-no planning for the relocation component of buyouts.

Buyouts in the floodway have many compelling benefits. Buyouts permanently relocate families to safer, less flood-prone areas. The resulting empty parcel of land creates city-wide benefits when it is restored to absorb stormwater and minimize flooding in surrounding areas. The buyout policy tool is also a one-time cost, as opposed to the repeated costs of rebuilding or home elevation. In the case of riverine flooding, Houston's most relevant chronic stress, taxpayers receive \$7 in benefits for every \$1 invested in buyouts by federal agencies. Benefits include lower costs from fewer future deaths, nonfatal injuries, and PTSD; lower repair costs for damaged buildings and contents; lower sheltering costs for displaced households, decreased loss of economic activity in the broader community, lower insurance costs other than insurance claims, and more (Porter et al., 2018).

**Houstonians receive \$7 in benefits  
for every \$1 invested in buyouts.**

Although buyout programs are generally paid for by a combination of federal and local funds and administered at the local level, federal entities have increased the pressure on local governments to more aggressively pursue buyout program participation. The federal government has already begun forcing some local governments to exercise eminent domain if residents refuse to relocate (Flavelle, 2020). In 2015, the Army Corps of Engineers issued guidance stating that a "100-percent voluntary participation plan...is not acceptable" for the Army Corps of Engineers' participation, and that all plans involving their participation must include the option to use eminent domain (USACE, 2015).



Buyout programs also have drawbacks as a policy tool for relocating folks from the floodway. For instance, the program is politically unpopular; for every \$100 spent to rebuild homes with national flood insurance funds, FEMA spends just \$1.72 on buyouts. Buyout programs may be unpopular because they are extremely complex and slow. Even if a homeowner is open to being bought out by the government, the process involves multiple federal agencies, state distribution, and municipal administrations. The homeowner might finally receive the proceeds from the sale of their home after eighteen months or more. In contrast, funds to rebuild a property can come within weeks, delivered via the National Flood Insurance Program.

Lastly, the U.S. has a history of using relocation and development to displace and consolidate non-white communities. Houston is no exception, as buyouts in Harris County have not always been evenly targeted. One study using data from 1985-2017 concluded that buyout zones were “disproportionately populated by Hispanic residents, above and beyond what we might otherwise expect from their demographic growth in the area as a whole” (Loughran et al., 2019). Other research in Houston has found that property buyouts have been disproportionately located in areas with high levels of “white flight” in the decades preceding the government buyouts. Areas with high levels of racial stability, regardless of which racial group predominates, are less likely to become major buyout areas even in the presence of identified environmental risk (Loughran & Elliott, 2019). These findings demonstrate that social inequities, racial segregation, and neighborhood history have affected that traditional buyouts of the past.

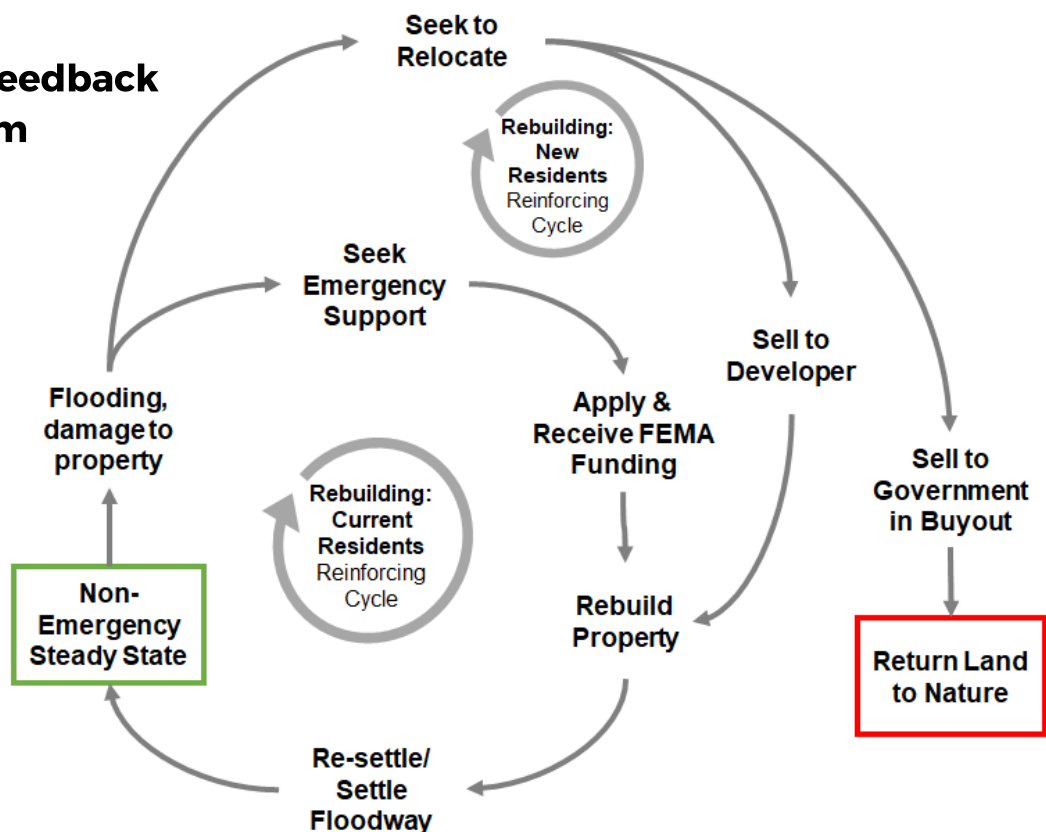
**"The USA has a long history of social inequality that has manifested in low-income and minority populations living in vulnerable areas. When buyouts disrupt communities, they may exacerbate this inequality. But not acting—leaving low-income and minority populations in areas known to be hazardous or using federal funding to rebuild in those areas—also perpetuates inequality. There are strong arguments in favor of disproportionately retreating low-income communities as they are at greatest risk and have fewest resources to recover.” (Siders, 2019)**

# Systemic Diagnosis

## Understanding the Current Incentives and Deficiencies

Floodway residents should be understood as goal-seeking agents who are participating in a system of incentives. Feedback loops are a helpful way to demonstrate the interaction of different variables and decision points. In examining the reinforcing cycles below, we see that the case for not participating in a voluntary government buyout program is rational and predictable. Beginning with the green box, "non-emergency steady state," we can follow the diagram around to follow the options available to a homeowner after a flooding event. The distinguishing factor for a homeowner to sell or rebuild is an unknown level of exasperation; the difference in the choice to sell to a developer or the government is the cost and speed of the offer. A voluntary government buyout offer must compete with the options to rebuild and offers from developers.

### Reinforcing Feedback Loops Diagram



Without government intervention, people will continue the cycle of rebuilding in the floodway.

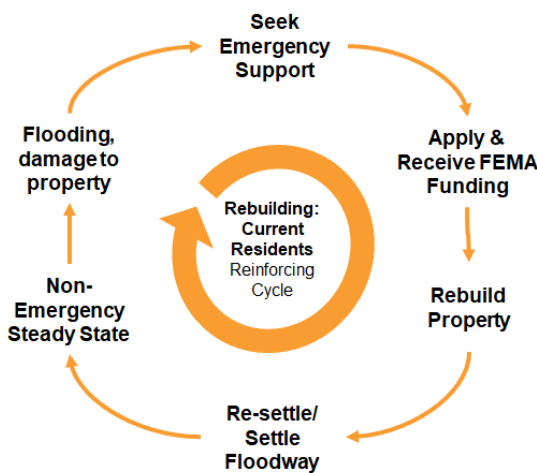
# Resident Experience

## Living through Disaster in the Floodway

The examples of Adrian and Marta, templates of typical floodway residents, demonstrate that, although the flooding and stresses are predictable and increasing in frequency, the incentives all point to rebuilding or selling to developers rather than accepting government buyouts.

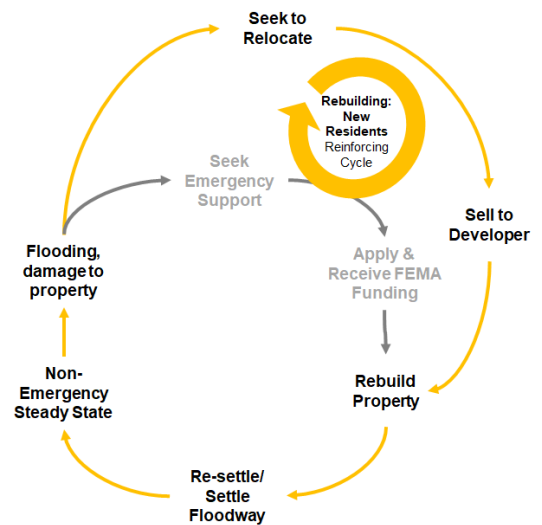
### Example A: Adrian

Adrian and his family have been homeowners in the Meyerland neighborhood of Houston for the last forty years. Adrian purchased his childhood home from his parents and has raised his children in the same house, alongside a community he knows and values deeply. He has never seen the Brays Bayou in his backyard flood more times than in the last ten years. Conscious of the risks of living near the beautiful bayou, Adrian has held an insurance policy through FEMA's National Flood Insurance Program. The premiums are still affordable under his new retirement income and the payouts after each storm usually come within sixty days of each disaster to rebuild. While anticipating and rebuilding after each storm generates some stress for Adrian, he knows it is just the cost of keeping his forever home.



### Example B: Marta

Marta and her family are relatively new homeowners in the Greenspoint Neighborhood of Houston. While Marta was initially attracted to the home because of the low-cost mortgage and proximity to her work, the last five years have not been easy. Each year her single-family home has flooded (eleven times last year alone) and caused significant strain and disruption for her and her children. After Tropical Storm Imelda last year, Marta has had enough of rebuilding: she is ready to sell. She finds two options to sell: one to a developer and one to the Harris County Flood Control District. Marta compares her offers and prioritizes speed of the offer. While Marta likes the idea of returning her home on Greens Bayou back to nature, the county informs her that it will be nine to twelve months before she can move out. With that information, it's a no-brainer for her family to sell to the developer and get out before the next storm.





# Systemic Diagnosis: Current Capabilities Mapping Buyout Programs in Houston

Buyouts today are complex, involving all levels of government with mixed capacity, with long lead times, and regulatory restrictions. The agencies tasked with buyouts today span departments and missions: Harris County Flood Control District, the City of Houston Public Works Department, the City of Houston Housing and Community Development Department, and the non-profit Houston Parks Board. However, their various programs are uncoordinated across offices and are not integrated with larger planning efforts. The lack of zoning in Houston also complicates local officials' ability to create comprehensive plans and restrict the development of unsafe areas. This section of our report briefly outlines existing buyout programs, followed by funding sources. For more details on the programs and their funding sources, see Appendix 1.

## Summary of Buyout Programs Today

	Harris County	City of Houston		Private
	Flood Control District	Public Works Department	Housing and Community Development Department	Parks Board
Target Structures	Single-family, prioritized by FEMA flood maps	Single-family, prioritized by proximity to capital improvement projects	Multi-family, prioritized by neighborhood and repeated flooding	Single- or multi-family, prioritized by proximity to parks/parks planning
Number of buyouts	3,014 (1985-2017)	In progress	In progress	1,000 acres
Core Competency	Acquisition, Demolition, Restoration, and Relocation	Demolition (General Services Department) and Restoration	Acquisition	Acquisition, Demolition, and Restoration
Funding Source	Bond measure, FEMA grants (HMGP, FMA, PDM), County funds, City funds	HMGP (FEMA) – though currently primarily used for home elevations	CBDG-DR (HUD)	Private donations, federal RESTORE grant (BP oil spill)
Basis for Fair Market Value	Pre-flood value	Post-flood value	Post-flood value	Negotiation

The City of Houston currently has several sources of funding for buyouts and resilience more broadly. After a disaster, federal funds are made available to supplement local funds through a cost-share program, as state and municipal governments do not have enough money on-hand. The City of Houston has so far received more than \$74.9 million from various federal programs for buyouts specifically. Additional federal funding for resilience and flood mitigation efforts may also be applied to buyouts. Each federal funding source has its own funding amount, applicable years, and strict regulations and eligibility requirements. Federal funding is therefore quite slow, relatively inflexible, and extremely complex to manage effectively and efficiently.

At the county level, Harris County voters approved a \$2.5 billion flood damage reduction bond in 2018, gaining the support of 85% of voters to spend the money guided by principles of equity. The City of Houston benefits from some of that funding when it is used for infrastructure projects in the City, which may include acquisition. Houston's City Departments may also work with Harris County to conduct buyouts. The Harris County Flood Control District, for example, has conducted single-family buyouts on the City's behalf, tapping into a \$10 million bucket of federal funding allocated to the City for flood events that occurred in 2015.

Oversight of these agencies and funding sources is sometimes provided at the state level by the Texas General Land Office and through federal restrictions on funding from HUD or FEMA. Regulations include requirements under the Uniform Relocation Act, which stipulate the financial assistance that tenants are entitled to, and federal guidelines around eligibility, which exclude certain types of homes and immigrants.

Due to the complexity and long timelines of these various programs and funding sources, Houstonians almost always prefer to rebuild and upgrade their homes instead of selling their homes and moving out of harm's way. Given the historical buyout capacity of Harris County Flood Control District, it would take nearly 60 years to buy out all the floodway properties that the City wants to be relocated by 2030. The City will need to significantly ramp up a program to conduct buyouts at a sustained rate that the city has not experienced since 2002, after Tropical Storm Allison.

**At the current rate, it would take nearly 60 years to buy out all floodway properties.**

While multiple entities in the Houston area have been conducting buyouts, their programs are not well coordinated or integrated into a broader planning or resilience goal. As a result, these programs do not break the cycle of rebuilding at the rates necessary to remove the more than 7,000 habitable structures from the floodway.

# Recommendations

## Buy-in/Buyout (Strategic & Managed Retreat)

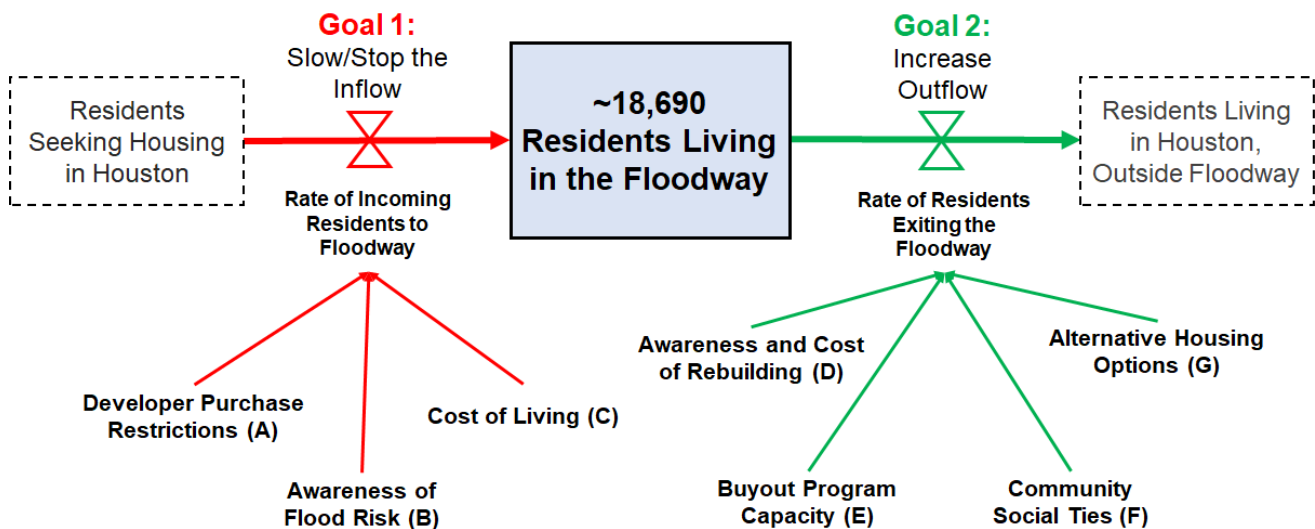
As the “Resilient Houston” report suggests, the City is not content to use federal recovery dollars to react to past disasters. Instead, the City is proactively preparing for future disasters by becoming more resilient across multiple dimensions, including economic equality and social cohesion. The “buy-in/buyout” concept is part of a larger shift towards a strategic and managed retreat from the bayous that also achieves the City’s larger resilience and social goals. The buy-in/buyout process means including community participation in and endorsement of relocation plans. To that end, Houston must move from opportunistic buyout programs nested in multiple agencies to an integrated and scaled-up buy-in/buyout program that includes a relocation strategy at the forefront. The toolbox of interventions should include building comparable affordable housing, planning for equitable relocation, and increasing the number of relocations.



*Residential neighborhoods near the Interstate 10 sit in floodwater in the wake of Hurricane Harvey on August 29, 2017 in Houston, Texas. (Marcus Yam / Los Angeles Times via Getty Images)*



We apply the buy-in/buyout concept to a quantifiable goal: removing all habitable structures from the floodway. The below figure diagrams how the City should tactically intervene to end the cycle of rebuilding and clear the floodway, while implicitly adhering to buy-in/buyout principles. The City must undertake two goals: the first is to limit the number of residents moving into the floodway, and the second is to increase the number of residents moving out of the floodway [3]. Both goals must be addressed simultaneously, or the number of residents living in the floodway will continue to rise. For a more detailed explanation of this diagram, please see Appendix 4.



The thirteen recommendations that follow are built upon the City and County’s current capabilities, our diagnosis of the systems of incentives, and case studies from peer cities or previous buyout programs in Houston. Organized into “Governance,” “Program,” and “Policy Reform” categories, they should be considered interlocking components of the same system, geared toward achieving the future vision of ideal resident experience.

**“Retreat is not a goal in and of itself but a means of contributing to societal goals.” (Siders et al., 2019)**

[3] To estimate the number of residents living in the floodway, we multiplied the estimated number of housing units in the floodway by Houston’s average household size (2.67 residents per unit). As there are 6,174 documented multi-family units in the floodway, we conservatively estimate 7,000 total residential units in the floodway.

## Summary Table of Sequenced Recommendations

	Months 0-6	Months 6-18	Months 18-30
<b>Governance Recs</b> HIGH benefit, LOW effort	1. Appoint Departmental Resilience Officers 2. Establish an Intergovernmental “Buy-in/Buyout” Task Force 3. Develop a prioritization strategy for acquisitions 4. Onboard Project Managers and a Policy Manager		
<b>Programmatic Recs</b> Buy-in for Buy-outs HIGH benefit, MEDIUM effort		5. Build and maintain community support 6. Give incentives for neighbors to be bought out together 7. Contract with a non-profit organization to provide caseworkers 8. Market the Buy-in/Buyout Program 9. Integrate HCDD housing strategy 10. Map and plan for impacts on the receiving communities	
<b>Policy Reform Recs</b> HIGH benefit, HIGH effort			11. Advocate for Reform of National Flood Insurance Program 12. Restrict development in vulnerable areas 13. Prepare flexible funding

Each recommendation is accompanied by an evaluation of its impact and resource cost, and assigned a lead office. “Impact” indicates the estimated effect the recommendation will have on the goal of relocating all residents in the floodway, including scale, duration, and depth of effect. “Resource Cost” encapsulates financial, political, and administrative lift. “Lead Office” indicates which department should take ownership of the implementation of the recommendation.

# Months 0-6

## Four Governance Recommendations

Resilience and recovery efforts must be expanded and coordinated across levels of government to meet the goal of removing all habitable structures from the floodway by 2030. Governance is foundational to the other recommendations to ensure the efforts add up to an integrated long-term vision. Guided by the strategic planning of the Office of Resilience, the Recovery Office should be prepared to take on an enhanced coordination role across the City and County. To internalize this formal authority even after the end of the current mayor's term, City departments must make structural changes and systematize coordination. These governance recommendations include appointing Departmental Resilience Officers, establishing an intergovernmental Buy-in/Buyout Task Force, soliciting and onboarding project management support, developing a prioritization strategy for acquisitions, and giving incentives for communities to be bought out together.

### **Recommendation 1: Appoint Departmental Resilience Officers**

**Impact:** Medium **Resource Cost:** Low **Lead Office:** Resilience

In alignment with Resilient Houston Target 13, every City department should appoint Departmental Resilience Officers (DROs) that will meet every month to coordinate resilience efforts. These DROs, steered by the City's Chief Resilience Officer, will have coordination responsibility across the many resilience efforts. The goal of increasing coordination is to strategically prioritize investments and avoid duplication of efforts, all while putting the Houston resident at the center of the discussions. The buy-in/buyout program will be just one agenda item in a larger city-wide strategy for resilience, with the understanding that buyouts may disrupt many other city services and functions.

Departmental Resilience Officers should have their responsibilities added to their job descriptions, with clear reporting structures. These responsibilities include attending the monthly meetings, briefing their department heads at regular intervals, serving as resilience subject matter experts for their departments, and reporting on departmental progress on various project tasks.

The Office of Resilience must first meet with department heads to make the case for DROs. Political support from the Mayor is crucial, but for maximum effectiveness, employees throughout the City must be oriented toward resilience—and that begins with the department heads.

## Recommendation 2: Establish an Intergovernmental “Buy-in/Buyout” Task Force

**Impact:** Medium   **Resource Cost:** Low   **Lead Office:** Recovery

Relocating families will require City-wide resources and cannot be done through one office or with one policy tool alone. The City should replicate processes from current task forces around infrastructure and drainage to create a Buy-in/Buyout Task Force. As the “buy-in/buyout” concept suggests, the Task Force would oversee the broad categories of acquisition, equitable relocation and affordable housing, and restoration or development of green infrastructure. The Task Force would also integrate these broad categories with Houston’s larger resilience goals, factoring in Opportunity Zones, new development regulations for affordable housing, densifying transportation centers, and the capacities of social services like schools and hospitals.

The Buy-in/Buyout Task Force should be specifically nested within the DRO structure as one program with a quantifiable goal: removing all habitable structures from the floodway by 2030. The Task Force should be chaired by the Chief Recovery Officer and report progress directly to the Mayor in service of resilience targets.

Representatives from HCDD, PW, Parks, Planning, HCFCD, and the Parks Board should be invited as directed by the Chief Recovery Officer. Each office has a unique approach, competency, and funding source to bring to bear on the diverse properties to be acquired. For example, the Parks Board can quickly purchase properties using philanthropic dollars when a homeowner is unable to wait eight- to eighteen-months to complete the process with HCFCD. The Buy-in/Buyout Task Force should stay nimble and leverage DROs’ core competencies by organizing breakout groups that are assigned to acquisition, relocation, and restoration.

The Buy-in/Buyout Task Force should function as an overarching project manager, driving coordination and reporting while department-specific project managers take the lead at different phases. This is especially important in coordinating the use of federal funds and in creating a timeline that maximizes the likelihood that a resident will choose to participate in the buyout program. For an example of how this might work, see the Greenspoint case study on page 30.



## Peer Case Study: New York State Superstorm Sandy Recovery

Superstorm Sandy made landfall in the northeast on October 29, 2012. At the time, it was the costliest hurricane on record in the United States, with almost \$70 billion in damages—surpassed only by Hurricane Harvey in 2017. As with Harvey, Sandy followed on the heels of two other destructive storms from the year before, resulting in the cumulative damage of over 260,000 housing units.

New York centralized its recovery efforts by creating a stand-alone office, the Governor’s Office of Storm Recovery (GOSR), instead of nesting oversight within an existing department. The advantage of this centralization was that fund disbursement and all efforts in housing, infrastructure, and resiliency were consolidated under one roof, allowing for easier coordination. Most importantly, residents had one portal through which they could explore all their options, especially with the complexities of multiple programs.

The learnings regarding acquisition and relocation are interspersed through the below recommendations as stand-alone boxes. Additional learnings from New York’s recovery effort more broadly are included in Appendix 2. A list of all buyout programs as of 2017 is attached as Appendix 3.

### Recommendation 3 : Develop a prioritization strategy for acquisitions

**Impact:** High **Resource Cost:** Low **Lead Office:** Recovery

The first deliverable of the Buy-in/Buyout Task Force is the coordinated development of a Map of Social Vulnerability in the Floodway. This internal strategy document should include aggregated flood risk information from FEMA’s Flood Insurance Rate maps, capital improvement projects, types of structure in the floodway and floodplains, and community input based upon a willingness to sell. In addition to traditional neighborhood demographics, communities should be clustered by flood risk, including income, race, and percentage of homeownership.

The resulting map will be used to internally create buyout projects, prioritize buyouts, and inform policies for incentivizing those buyouts. City Departments and the Harris County Flood Control District likely already have maps or ideas of which properties to prioritize; creating one consolidated map will allow Departments to coordinate efforts. The New York Rising buyout program, for example, designated two tiers of properties, including enhanced buyout zones, which had distinct policy land-use restrictions and monetary incentives.

This internal strategy map will also assist in determining which funding source and which office will take the lead for each buyout project, or cluster of properties. HMGP funding should be used for buyout projects that are adjacent to capital improvement projects, facilitated through the Public Works Department. For single home properties that are in areas that cannot be used to mitigate flooding—in other words, people for whom the only benefit of the buyout is moving them out of harm’s way—CDBG-DR funding should be used, led by HCFCD. The map also provides a critical analysis of the total cost of removing all habitable structures out of the floodway, and traces funding sources to cover the cost. If the currently allocated funding is insufficient, the analysis will serve as an important measurement of unmet need, which can be used in future federal funding applications.

There is tension between planning for a buyout area and publishing the targeted area. The Privacy Act of 1978 forbids the publication of which individual parcels have claimed flood insurance payments. However, general or aggregated information, such as total claims paid to a community or an area, or data not connected to a particular property, may be made public. For example, a community may publish a map showing a repetitive loss area or a list of addresses in that area, provided that it does not show which individual addresses or parcels received flood insurance claim payments (Mapping Repetitive Loss Areas for CRS, 2015).

There is some concern that this type of transparency may lead to land speculation. The City can and should explore policies to mitigate the possible effects of any potential land speculation. Ultimately, however, that possibility should not prevent the proliferation of valuable information that will keep Houstonians safe.

#### **Recommendation 4 : Onboard Project Managers and a Policy Manager**

**Impact:** High **Resource Cost:** Medium **Lead Office:** Recovery

The Office of Recovery does not have the current staff capacity to purchase over 700 properties in the floodway per year to reach the 2030 goal. Full-time, dedicated project managers are needed to scale to the buyout pace, and may be sourced from existing City staff or contractors. As Office of Recovery employees, the project managers would be responsible for the day-to-day project management of specific buyout projects, including marketing, community support building, regulatory specialists, prioritization, and monitoring. Buyout projects and prioritizations would be determined by the Buy-in/Buyout Task Force described in Recommendation 3.

Project management support should be scaled in accordance with the pace of buyout projects set by the Taskforce, but a preliminary estimate would be to hire one to three Project Management Buyout Specialists for a four-year time horizon. The Office of Recovery would need to coordinate with department heads from other Houston offices to secure the dedicated project management support.

The Office of Recovery should also onboard a policy manager. The policy manager would have expertise in federal, state, and local regulations regarding buyouts, and would assist the Offices of Resilience and Recovery in standardizing compliance with those regulations. The policy manager would ideally be an internal hire or detail from within City departments such as HCDD, as they are already familiar with federal and state regulations and City policies.

## **NY GOSR Learning**

Understanding and interpreting federal regulations for conducting buyouts is a specialized and human capital-intensive competency. For example, CDBG-DR funding precluded buyouts for second homes or from “unqualified aliens.” After some exploration by the legal team, GOSR ultimately conducted some buyouts in the name of a US-born child of an “unqualified alien.” GOSR also needed to ensure compliance with procurement and appraisal regulations, particularly because they were purchasing homes at pre-storm values. GOSR used CDBG-DR funds exclusively, but they still noted that they would have benefited from a full-time regulatory and policy manager to assist the director with these types of regulations. The City of Houston, juggling multiple federal and county funding sources, is arguably even more in need of a policy manager.



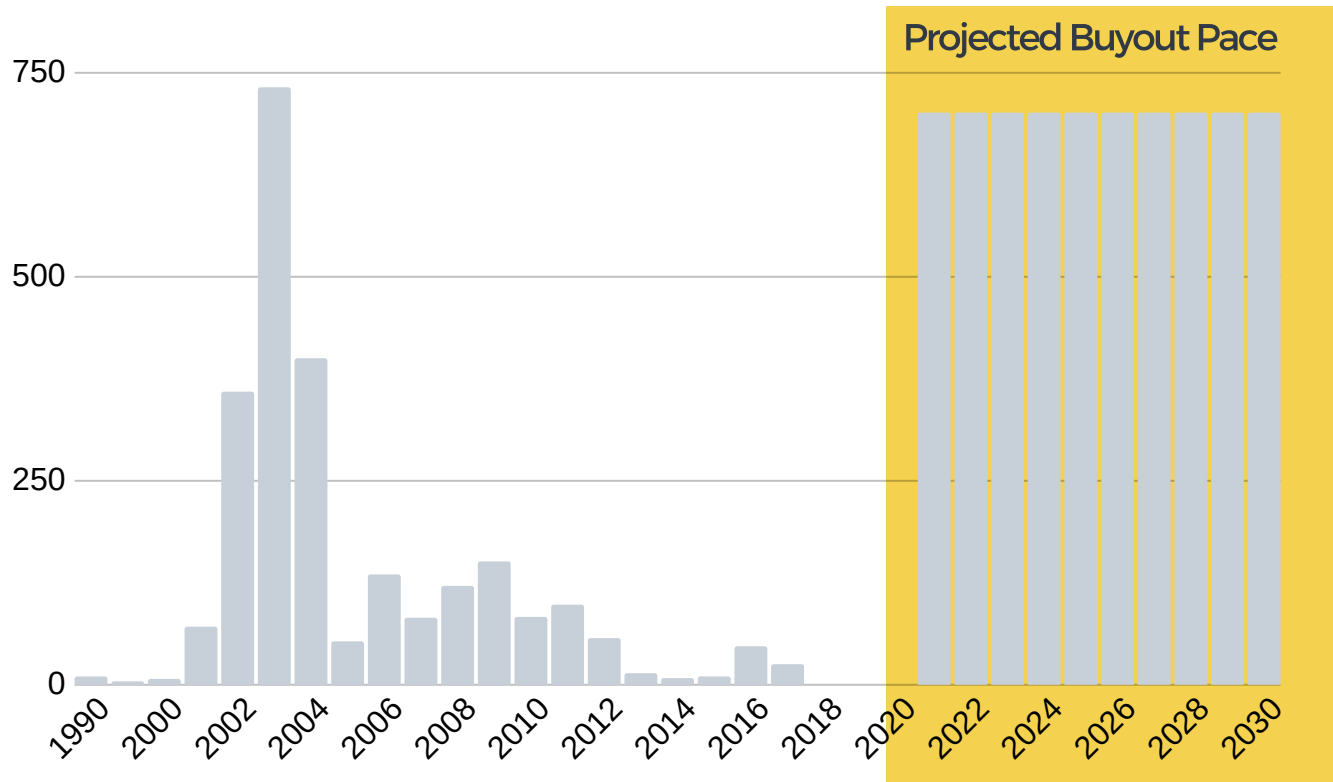
*Destroyed homes during Hurricane Sandy in the flooded neighborhood at Breezy Point in Far Rockaway area of NYC, Nov 2012 (©AdobeStock)*

# Months 6-18

## Six Programmatic Recommendations (Buy-in/Buyout)

Building on the quick wins and governance preparations made in the first six months, the next recommendations include programmatic and policy options to match the scale of the vision for the buy-in/buyout program. The rate of buyouts will need to be sustained annually at a rate seen only once in the history of the City of Houston (723 homes bought-out in 2002 after Tropical Storm Allison).

Home Buyouts conducted by Harris County to Date



To meet the goal of removing 7,000 units from the floodway by 2030, Houston must increase buyout program participation to 700 units per year for 10 years.



The recommendations include building and maintaining community support, contracting with a non-profit organization to provide caseworkers, marketing the home buyout program, integrating with HCDD housing strategy, and mapping for impacts on the receiving communities.

## **Recommendation 5 : Build and maintain community support**

**Impact:** Medium **Resource Cost:** Low **Lead Office:** Resilience

Homeowners and renters in the floodway may have different levels of understanding of their flood risk and exposure. While some residents accepted the risk when they moved in, others may be completely unaware they are now squarely in the floodway, as FEMA maps have been updated and expanded. According to local Harris County Flood Control District officials, “these are homes that were simply built in the wrong place, prior to the knowledge we have today of the boundaries of our floodplains and prior to building regulations imposed by the city and county on land development” (Loughran & Elliott, 2019).

Residents must be proactively and regularly informed about the costs of living in the floodway and their options for leaving. Providing detailed literature at a predictable rate can help residents better understand the risks they are taking. It can also build communication channels that can be tapped when disaster strikes or there are updates to eligibility requirements (Boyer, 2019). If residents know more about the exact damage that they will face if they continue to live in the floodway, they may be more likely to participate in a buyout program. This communication and support could take the form of community meetings, flyers, one-on-one meetings, and door-to-door canvassing.

The Office of Recovery should meet and discuss housing, relocation, and green infrastructure with neighborhood district leaders, community development organizations, fair housing advocates, and non-profit and religious organizations to communicate the risk to those in the floodway. It is crucial to build trust with community leaders and solicit and incorporate their feedback, as they are instrumental to the success of any outreach effort. Officials should also stress that if a homeowner accepts a government buyout, their property will only be used for green infrastructure.

## **Recommendation 6: Give incentives for neighbors to be bought out together**

**Impact:** High **Resource Cost:** Low **Lead Office:** Recovery

Prior studies of post-disaster mobility have indicated that economic factors and levels of property damage are not the prime determinants of individuals’ decisions to relocate, but rather local social ties—whether in the form of employment, family and friend networks, or general place attachment—tend to play a stronger role. These factors shift in relative importance at different points in the life course (Loughran & Elliott, 2019).

A Rice University study revealed that 62% of flood victims planned to stay where they lived. These people were much more likely to rate “emotional attachment to the neighborhood” as more important in their decision-making process compared to people who chose to leave their flooded homes. Additionally, 28% of respondents reported “financial concerns” as their primary motivation for staying or leaving flooded residences (Boyer, 2019).

Successful buyout programs have used federal and local matching dollars to increase the likelihood that whole communities move, and move together. For the highest-priority, repeatedly damaged homes, New York State used HUD funds to offer an additional 10 percent bonus on top of the pre-market valuation of the home if all the homeowners in an area agreed to participate in the program. Additionally, as an incentive to keep residents within the tax base, a 5 percent bonus was provided to those who relocated within the same county.

The Buy-in/Buyout Task Force should determine what incentives can be offered to encourage residents in highest-priority buyout properties to move together. The opportunity to be bought out and relocated together aligns with the “buy-in” principle of minimizing disruption to a community as much as possible. Moving together also prevents the checkerboard effect of sporadic buyouts and home elevations, where the larger plots of land cannot be returned to nature.

If adopted by the City, the policy would shift social pressure to neighbors to market the idea of a buyout to each other, increasing the likelihood of large-scale buyouts. During the early stages of the program, program managers should monitor whether the social pressure of relocating together is creating inequities within communities who wish to stay or mitigate in other ways.

Monetary incentives may not be enough to participate in the buyout program if one of the reasons for not moving is losing the social cohesion of neighbors. In this scenario, an effective option is to relocate neighbors together into new housing developments. Both options can increase buyout program participation, success, and stability.

## Oakwood Beach, Staten Island

Oakwood Beach in New York City was a middle-class community consisting largely of single-family homes. After Sandy, the residents formed a committee and approached New York for a 98% buyout of the 326 homes (Kashiwagi, 2019). Properties were purchased at pre-storm value and homeowners were offered a 5% bonus if they stayed within the community but out of harm’s way—although some residents went on to purchase flood-prone homes (Siders et al., 2019). As of 2017, 300 parcels (in purple) have been purchased for more than \$120 million and have been returned to nature.



## **Recommendation 7 : Contract with a non-profit organization to provide caseworkers**

**Impact:** Medium **Resource Cost:** Medium **Lead Office:** Recovery

The Office of Recovery should contract with a non-profit firm to provide caseworkers to serve as a conduit between project managers and floodway residents. All projects managed out of the Office of Recovery should use the same non-profit firm where possible to simplify the maintenance of quality standards, though multiple non-profits may need to be engaged to cover the entire floodway. Caseworkers are empathetic, informed, and supportive guides in a stressful and complicated relocation process for residents.

Contracting, rather than hiring in-house caseworkers, has several advantages. Residents may be more likely to trust staff from non-profit firms: Rice University's study of flooding and recovery after Hurricane Harvey found that 12.5% of respondents lack trust in politicians and public officials (Boyer, 2019). Contracting also allows city officials to continue specializing in administration, and the division of labor encourages faster scaling. Where possible, the Office of Recovery should encourage firms to hire caseworkers from the communities they serve.

Caseworkers should be assigned to work within specific projects, reporting to the project managers in the Office of Recovery but treating the residents as their clients. Caseworkers are outreach coordinators and educators, as they increase awareness and understanding of the buyout program. Caseworkers should be physically present and active in their assigned communities, accessible to residents. Their contact information should be advertised as part of their assigned communities' Affirmative Marketing and Outreach Plans, and they may be required to canvass neighborhoods door-to-door. They should be familiar with which funding source will be used to purchase their clients' homes, the restrictions associated with those funding sources, and the actions required of their clients to maximize financial benefits.

After a flood event, caseworkers are crucial for alleviating as much stress and uncertainty for the resident as possible. Caseworkers should immediately contact their clients to offer support and inform them of their buyout options. They should remind their clients of duplication of benefits policies, emphasizing the need to preserve receipts of repairs.

For multi-family acquisitions, caseworkers are also relocation specialists, as they connect renters to potential affordable units and explain relocation assistance. For example, renters may not know all of their eligible benefits, which include receiving up to \$7,200 in housing relocation assistance under the Uniform Relocation Act (HUD, 2014). More details on the URA are included in Appendix 6. Renters may also receive additional assistance if local funding is made available. Ideally, in addition to explaining renters' benefits, caseworkers would bring renters to tour the affordable housing units that would become available just when the renters need it.

## NY GOSR Learning

Caseworkers were vital to the success of the buyout process. Even with homeowners volunteering for buyouts, New York undertook an extensive canvassing effort to explore options with neighboring homes. This labor- and time-intensive exploratory phase took nearly a year, with caseworkers regularly out in the field, establishing trust with the community. For the buyout program, GOSR relied primarily on contractors rather than embedded state staff. These contractors included appraisers, caseworkers, and lawyers to close purchases.

### Recommendation 8: Market the Buy-in/Buyout Program

**Impact:** Medium **Resource Cost:** Medium **Lead Office:** Recovery

Homeowners and residents in the floodway should immediately recognize and understand the City's buy-in/buyout program. Increased awareness comes through outreach, mass marketing, partnerships with community leaders, and increased transparency with Houston residents. Increased understanding comes through residents' trusted relationships with qualified, non-profit partner caseworkers. The below recommendations should be undertaken as soon as possible. Setting up this communication infrastructure now is crucial to building the City's capacity to promote the buy-in/buyout program immediately after the next flood—in addition to aiding the City's buyout program today, pre-crisis.

The Office of Recovery should increase transparency and streamline communication with residents by launching a website for the relocation effort. All City departments' individual webpages about relocation should be redirected to the new website, as centralizing communication reduces confusion and misinformation, especially after a disaster. The website should also increase transparency around which properties will be eventually purchased by the City. While it is not necessary for the website to publish maps, users should be able to input their addresses to determine where in the floodplain their homes are located: floodway, 100-year floodplain, or 500-year floodplain.

The Office of Recovery should, in collaboration with HCDD and PW, create Affirmative Marketing and Outreach Plans for each project. These plans have the dual purpose of disseminating information while ensuring HUD funding. The bulk of the AMOPs would be boilerplate, particularly regarding marketing through advertisements, earned and social media, billboards, community events and libraries, and the like. The 2018 AMOP created by the Houston-Galveston Area Council-East/Gulf Coast Region for the Texas Homeowner Assistance Program is a helpful template. As every community in Houston has unique needs and concerns, however, certain aspects of each AMOP will be unique (for example, identifying community partners and canvassing efforts).



Given that there are more than 7,000 habitable units in the floodway, door-to-door canvassing is highly impractical but for a few select neighborhoods. At the same time, door-to-door canvassing creates more opportunities for the City to build trust, provide detailed information, and demonstrate its commitment to a superior customer service experience. It also enables the City to reach communities that are less likely to respond to news articles and advertisements and are unable or unwilling to proactively engage with City officials. Door-to-door canvassing may be most impactful for LMI individuals and families who own the homes they live in (Houston Public Works Department, personal communication, January 23, 2020).

The Homeowner Assistance Program, managed by Houston's Build It Forward, has already identified 59 ZIP codes that qualify as LMI (Appendix 4). The Office of Recovery should cross-reference these ZIP codes against the homes that are in the floodway and owner-occupied, then prioritize canvassing those homes. For tenant-occupied homes, canvassing is likely to be ineffective; the Office will need to rely on phone calls, emails, and physical mailers to the owners of the rented homes.

All representatives of the Office of Recovery must be sympathetic and honest when addressing this topic. Residents understandably experience a variety of emotions when considering a buyout, and representatives of the Office of Recovery must be sensitive to residents' experience. At the same time, the Office of Recovery should speak plainly about the benefits and drawbacks of government buyouts, as well as the future risk of living in the floodway. Honesty is paramount to establishing trust; representatives should not overpromise in their attempt to convince a resident to participate in the buyout program.

Each AMOP should include the City's strategy for building partnerships with community leaders. Council members may support home elevations instead of buyouts, object to shifting their voters to other districts, or raise concerns about adequate affordable housing. The Office of Recovery should have a plan for answering these concerns candidly while emphasizing the current and future danger of living in the floodway. The City must also build relationships with other community leaders, including members of civic organizations, management districts, and religious leaders. Remembering that actions are more powerful than words, the City should conduct tours of new affordable housing units with community leaders, connect them with homeowners who have experienced buyouts, and include them in planning efforts.

## **Recommendation 9: Integrate HCDD housing strategy**

**Impact:** Medium **Resource Cost:** Low **Lead Office:** Resilience

Relocating residents in the floodway is as much a housing issue as it is a climate adaptation issue. The population of Houston continues to grow rapidly, exacerbating an existing shortage of affordable housing.

In 2018, the Houston-Woodlands-Sugar Land Metropolitan area provided only 19 affordable units for every 100 households that are extremely low income—the sixth-worst ratio of all U.S. metro areas [4]. The goal to clear the floodway of all habitable structures will only add to this affordable housing shortage, as at least 7,000 primarily low-to-moderate income units will be eliminated. To accommodate these relocating floodway residents and the next million Houston residents, the City aims to build at least 375,000 new homes across all income levels by 2050 (Mayor’s Office of Resilience, 2020).

The locations of the housing options are a key element for maximizing participation in buyout programs. Recent research has shown that buyouts, though framed by policymakers as voluntary, individualized choices, are actually quite complex. Buyout decisions involve considerations about the appropriate response to environmental threats and, importantly, where to go next (Loughran & Elliott, 2019). Many residents will look to move to adjacent neighborhoods, generally within the same school district, to mitigate the disruption of moving. Some communities may want to move together to an adjacent area if comparable housing is available.

Some residents will prefer to take a public housing voucher to live in an area with higher upward mobility. “What probably matters as much if not more to homeowners is where they see themselves resettling. If it is in a more desirable neighborhood, then the buyout is likely to be more attractive because it offsets lost attachments to place” (Loughran & Elliott, 2019). As Texas law does not obligate landlords to accept housing vouchers, however, vouchers have had limited success. For example, the 108 residents of Arbor Court, a rent-subsidized multi-family property in Greenspoint, have struggled to find units to rent. To increase the efficacy of housing vouchers, the City will again need to increase its number of housing developments, as any development that uses federal, state, or local funding is required to accept housing vouchers.

The timing of available affordable housing is another factor in encouraging buyout program participation. If the affordable units can be made available in synchronization with the buyouts, the resident experience is smoother and more convenient. This synchronization is extremely difficult, however, given construction constraints, other unforeseeable delays, and the need to coordinate across multiple City departments. The Buy-in/Buyout Task Force is meant to address some of these obstacles to streamline the process for the resident.

The Houston Housing and Community Development Department and the Office of Resilience must collaborate to create a housing strategy with integrated resilience principles. For example, city planners should densify neighborhoods out of the floodway near planned public transportation. The City should create ordinances for mixed-use neighborhoods, build with green infrastructure standards, establish affordable housing quotas, and encourage in-fill in areas with increasing vacancy rates. The City should also streamline permitting and standardize interpretations of ordinances to accelerate affordable housing development.

[4] “Extremely low income” is defined as below the poverty rate or less than 30% of median income. National Low Income Housing Coalition, “The Gap: The Affordable Housing Gap Analysis, 2018”.

## Neighborhood Case Study: Kashmere Gardens

Project Hunting was first proposed in 1990, but the first voluntary relocations did not occur until 2007. The public agency in charge of the relocation effort, Harris County Flood Control District, initially sought to relocate 800 households. Through a community planning process and with some community input, the public agency reduced the number of relocated households to forty. The HCFCD began construction in 2007, but it was not until 2014 that the HCFCD knew it would be eligible to have some of its costs reimbursed by the U.S. Army Corps of Engineers.

Interviews with 53 households affected directly or indirectly by relocation from flood-prone Kashmere Gardens in Houston show that the following factors need consideration when subjecting households to relocation: (1) suitability of new housing, (2) perceived competence of relocation specialists, (3) the relocation planning process, and (4) potential health issues for relocated households (Loughran et al., 2019).

### Recommendation 10: Map and plan for impacts on the receiving communities

**Impact:** Medium **Resource Cost:** Low **Lead Office:** Recovery

According to a 2019 study, planners should anticipate that Houstonians who accept a buyout will move into proximate, whiter neighborhoods. The study of the 2,366 traceable buyouts from Harris County Flood Control District between 2000-2007 revealed statistically significant trends of where people end up. First, relocating is a hyper-local process for Houstonians: over 90% of buyout participants stayed within the Houston Metropolitan Area, with a median distance of just a 10-mile distance from their original home. Second, the study found that “what appears to be driving environmental mobility is less the environmental push of imminent risk than the social pull of ‘upgrading’ the socioeconomic status of one’s neighborhood and by extension, its racial composition.” The result is that white residents will relocate to other parts of their own neighborhood, even though there are publicly identified flood risks, while minority participants relocate to whiter neighborhoods (Loughran & Elliott, 2019).

Anticipating where Houstonians will move with their buyout assistance is important not only for housing purposes but also for social services. Both buyout program areas—the sending community and the receiving community—will experience large shifts in healthcare systems, school systems, and other local social systems. Social services at the City and County level should be mapped to understand how the populations they serve will shift over time.

## Months 18-30

# Three Policy Reform Recommendations

The next set of recommendations includes ongoing advocacy and policy changes that will make the buyout program even more effective at the systemic level. Recommendations include advocating for reform of the National Flood Insurance Program, restricting development of vulnerable areas, and preparing flexible funding.

### Recommendation 11: Advocate for reform of National Flood Insurance Program

**Impact:** High **Resource Cost:** High **Lead Office:** Recovery

Purchasing flood insurance through the National Flood Insurance Program is meant to internalize the public externality cost of living in an area that repeatedly floods and receives government support. The NFIP premium, based upon updated flood risk maps, is the most effective way to signal the costs of a property's flood risk. However, rates are kept artificially low and do not reflect the full external costs. If housing price is a primary driver for moving into the floodway, potential buyers and renters would more likely be dissuaded from moving in if the premium fully reflected the true cost of living in the floodway.

The City of Houston should join the Natural Resources Defense Council in advocating for the reform of the National Flood Insurance Program. Under this reform, low- to median-income owners of homes valued under \$250,000 would continue to receive flood insurance at the discounted rate, in exchange for committing to a buyout if their property is substantially damaged by a future flood. This addresses the nearly two-year time lag between disaster and buyout that currently exists, a major obstacle to successful buyouts. If homeowners choose not to agree to the future buyout, they would be required to pay the full risk-based price of flood insurance coverage.

It is difficult to predict how long it will take for this national-level reform to be approved. Because of this, Houston should immediately support the Natural Resources Defense Council in their advocacy efforts. There will be political resistance, as the reform would mean that flood insurance premiums would increase for homeowners who do not agree to the buyout and for homeowners who do not qualify as low- to median-income earners. This also may increase flood premiums for owners of multi-family properties with NFIP coverage, which would increase rents. However, in conjunction with the right of first refusal and the existing ban on new construction in the floodway, this policy would make significant inroads in the goal to remove all habitable structures from the floodway.



## Recommendation 12: Restrict development in vulnerable areas

New construction in the floodway is currently prohibited, as are substantial improvements to existing structures in the floodway (Chapter 19, Houston Code of Ordinances, 2018). While this Chapter 19 restriction is an important step, the City should do more to accelerate the relocation of residents in the floodway. Government buyouts, priced fairly and executed speedily, should be the only option for homeowners in the floodway who are selling their properties. The four options below are different tools for achieving this goal, with varying levels of impact and resource costs. Each will require significant coordination and advocacy with the City Council and other stakeholders to pass and implement.

### Option A: Pass a “Right of First Refusal” ordinance

**Impact:** High **Resource Cost:** High **Lead Office:** Recovery

The right of first refusal is the right to purchase a specific property at a future date, under certain conditions. Applied to the relocation effort, the right of first refusal would give the City the right to preemptively purchase a property if the owner receives an offer. The City would either match the offer or, if the offer is substantially above fair market value, justify a lower offer. The City is under no obligation to purchase the property if it does not wish to do so.

The right of first refusal does not appear to have been applied to resilience efforts yet, though it has been used in multiple cities outside Texas to preserve affordable housing stock. This typically takes the form of “tenants’ right of first refusal,” where tenants are given the option to purchase their apartment building if the owner wants to sell, but may also apply to government entities (Way, 2007). While this form of the right of first refusal has not yet been used in Texas, the idea is beginning to gain traction. In the 2019 legislative session, Senator Kirk Watson introduced a bill, SB 864, that promoted the use of rights of first refusal in awarding Low Income Housing Tax Credits. The bill did not pass during the 2019 session, but was referred to the Committee on Intergovernmental Relations (Watson, 2019).

Passing such a measure would require significant political support at both the local and state level. With the wrong messaging, the policy could quickly become a lightning rod for individual rights’ advocacy groups. Therefore, to pursue this policy, the Office of Resilience should build political support among Council members, then among state legislators that represent Houston.

## Option B: Explore Life Tenancy Agreements

**Impact:** Medium **Resource Cost:** High **Lead Office:** Recovery

The National Park Service has historically used the acquisition of private property to protect and expand park land. In certain instances, the National Park Service has agreed that residents may stay on the newly acquired land for a certain number of years (typically 25 years or up to life tenancy) as a leasing arrangement (Peel, 2000). Under this arrangement, residents waive relocation benefits.

Life tenancy has the major advantage of allowing residents to stay within their communities while ensuring that homes are not rebuilt in the floodway. This structure may also reduce the purchase cost to the government, depending on the structure used. However, this type of agreement may be too complex for federal grant funding to handle, unless the City explores a partnership with the National Park Service.

The City of Houston may explore life tenancy agreements as a method of encouraging buyouts, though it has not explicitly been used for climate adaptation programs before. The National Park Service model could be adapted to stipulate that the monthly lease would be equal to residents' former mortgages, and that the tenancy would be for life or until the property is substantially damaged in a flood event.

## Option C: Explore Code Violation Penalty Fees

**Impact:** Low **Resource Cost:** Low **Lead Office:** Recovery

While the City of Houston does have land restrictions and building codes, violations of these local policies today have no enforced financial repercussions. Enforcing the financial penalties for code violations in the floodway will have the primary purpose of dissuading developers and homeowners from building unsafely. The penalties could then be used to augment local funding for land acquisition.

In the same way the revenues from a gas tax are used to maintain roads, the revenues from the code violation penalties would be used to make the floodway safer. To that end, revenues from other types of violations, like parking tickets or moving violations, should not be used for land acquisition.

## **Option D: Require sellers or lessors to notify buyers or lessees of the property's location in the floodplain**

**Impact:** Medium **Resource Cost:** High **Lead Office:** Recovery

Families who are considering moving into the floodway are not always aware of the flood risk. Under Texas state law, potential buyers and renters are only required to be notified of past flood damage during the time that the seller resided there. A developer who buys and “flips” a flood-damaged property before another flood occurs, therefore, is not obligated to inform buyers that the property flooded just a few years ago.

Similar to state ordinances notifying potential owners or renters of potential lead or asbestos hazards, City should work to require that sellers and renters notify potential residents if the property is within the FEMA-designated floodway, 100-year floodplain, or 500-year floodplain. The responsibility would be on the landlord or developer to view the updated FEMA flood maps ahead of the transaction and incorporate the policy as required. This solution may not dissuade renters or buyers from relocating into the floodway in significant numbers, but it does eliminate the economic problem of information asymmetry that the sellers hold and gives potential buyers and renters all the information on the risk they are exposing themselves to.

## **Recommendation 13: Prepare flexible funding**

The timing of federal money and the buyout process does not align with homeowners' expectations. For example, even with the robust Harris County Flood Control District buyout program, the timeline is one-to-two years before the homeowner can move. Funding is not available soon enough to capitalize on the “moment of clarity” that occurs right after a flood event. By the time a buyout offer reaches the homeowner, many have already submitted applications to FEMA and started repairs on their homes. Private developers also compete with government funding timelines with fast cash, then turn the property around to low income renters.

After Hurricane Harvey, over 800 people responded to a “Voluntary Interest Notice”—but less than 10% were interested in buyouts. The 10% that were interested in buyouts did not live adjacent to one another (Houston Public Works Department, personal communication, January 23, 2020). Three options for raising capital ahead of a disaster to be used for buyouts include passing a city-bond measure, re-characterizing the drainage fee, and partnering with philanthropies or private sector investors.

## Option A: Create and pass a City Bond Measure

**Impact:** High **Resource Cost:** High **Lead Office:** Recovery

A City bond measure would establish an emergency fund dedicated to disaster recovery and resilience. The advantage of creating an emergency fund is the flexibility of timing for buyouts. Harris County Flood Control District has used their local funds for buyouts, shortening the timeline from more than eighteen months to three or four months (Harris County Flood Control District, personal communication, January 23, 2020).

Building the political support for a new City bond measure would take significant mobilization and may be most feasible only immediately after a flood event, when community and political support might be highest. Harris County, for example, passed a \$2.5 billion bond measure a year after Hurricane Harvey. To build support for this bond measure, in three months HCFCD held 23 community engagement meetings in each of Houston's 22 watersheds, gathering public input and ideas (HCFCD, 2020b). HCFCD also received substantial political support from council members, state representatives, and representatives to Congress. The coordination, level of support, and speed were unprecedented. Replicating this unity would be difficult, but the City should begin reaching out to potential partners to build support for a new bond measure. Harris County Engineering Department

Harris County has experimented with other forms of flexible funding. A month after Hurricane Harvey, the Harris County Engineering Department approached the Harris County Commissioners Court for buyout funding. The Commissioners Court authorized \$20 million of County funds to be used for immediate buyouts of properties that met certain criteria. The first home was subsequently purchased only two months after Harvey, thirty days after the funds were authorized—significantly accelerating a process that typically takes eight to eighteen months or more. Ultimately, 48 homes and 26 vacant lots were purchased through this authorization, with 21 pending purchases as of August 2019. A year later, in September 2018, the Commissioners Court authorized the Harris County Real Property Division to seek reimbursement from FEMA for costs associated with the acquisitions. (Blount, 2019)

## Option B: Allow funding from the drainage fee to be used for buyouts

**Impact:** Medium **Resource Cost:** Medium **Lead Office:** Recovery

The City of Houston can also allocate capital for buyouts by re-characterizing the current drainage fee to explicitly include home buyouts. Build Houston Forward is an ongoing program to improve and maintain Houston's 16,000 miles of streets and 5,800 miles of drainage systems. Funding comes from property taxes, drainage fees, and third-party funds. For every \$100 collected in property taxes, for example, 11.8 cents go toward Build Houston Forward: first to pay down existing debt, then to new street and drainage projects.

Houston's drainage fee is determined by the type of property (residential or commercial), the square footage of impervious surface, and the type of drainage system serving the property. In 2018, Houston voted to affirm Build Houston Forward, formerly "ReBuild Houston," with the drainage fee funding specifically set aside for drainage activities only (Morris, 2018). Because of the substantial political cost of creating Build Houston Forward, the City should not attempt to charge a new fee or raise drainage fees beyond established schedules. However, the City should allow buyouts to be included in the definition of drainage activities, if those acquisitions are in service to drainage improvements. This makes funding available for buyouts to occur immediately after a flood event.

### **Peer Case Study: Charlotte, North Carolina**

Charlotte-Mecklenburg County uses their Storm Water Services fees to contribute to a "rainy day fund" that purchases damaged properties before they are repaired or rebuilt after a flood. (Storm Water Services, 2019) Charlotte's Storm Water Services fee is based on square footage of impervious surface, as is Houston's drainage fee. Charlotte's buyout program, while originally federally funded, is now entirely locally funded. As of 2018, Charlotte-Mecklenburg has acquired 400 properties, restoring 185 acres to the floodplain and avoiding an estimated \$25 million in flood losses. FEMA contributed \$28.8 million, while state and local funds contributed \$33.5 million (GHFMC, 2018).

### **Option C: Partner with philanthropies and other private investors**

**Impact: Medium Resource Cost: Low Lead Office: Recovery**

Philanthropies and private investors provide extremely flexible capital because it is not attached to federal or state guidelines. FEMA's Hazard Mitigation Grant Program, for example, requires local governments to cover a percentage of the project's cost. Philanthropic or corporate dollars could cover that percentage, modeled on partnerships the City has had with the Houston Parks Board.

Opportunity Zones may make these types of partnerships more attractive to private investors. Opportunity Zones are census tracts that have been selected for economic development, in which new investments are eligible for preferential tax treatment. The City of Houston contains 99 OZs, with investment priorities that include affordable housing and investments with the ten Complete Communities. (Office of Economic Development, 2020) Where possible, Buy-in/Buyout Task Force projects located within OZs should be opened to private investment through Qualified Opportunity Funds.



# Vision: Recommendations in Action

## Strategic & Managed Retreat of Greens Bayou, Greenspoint Neighborhood

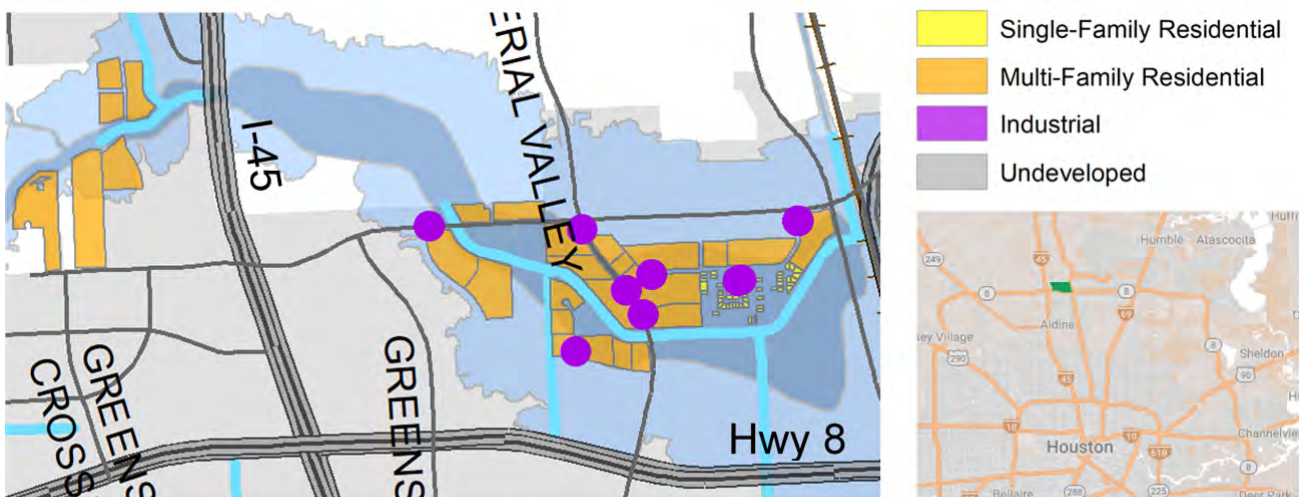
In previous sections, we saw the distressing and frustrating experience of floodway residents from Adrian and Marta’s perspective. Here, we envision the ideal buyout experience from the City’s perspective, implementing the suggested recommendations and seeing their effect. We use the Greenspoint Neighborhood, an area that has flooded multiple times, as a case study.

### Ideal Phase 0: Understanding the neighborhood

An in-depth study is done on the area, concluding that the master-planned vision largely laid out in the “Living with Water” document published in January 2020 is the most viable plan for the region (Office of Resilience, 2020). The development of this vision requires funding, community engagement, and stakeholder coordination—across multiple phases of acquisition, relocation, and restoration. The Buy-in/Buyout Task Force assigns one project manager to coordinate the breakout groups of Department Resilience Officers that tackle the three phases in Greenspoint.

### Ideal Phase 1: Acquisition

Funding for the Greenspoint land acquisition is sourced from the CDBG-DR programs, HMGP, and the Houston Parks Board. The Buy-in/Buyout Task Force’s Map of Social Vulnerability in the Floodway finds that the Greater Greenspoint Management District, highlighted in green in the map of Houston, has 28 multi-family properties and 70 single-family homes.



Maps provided by Houston's Public Works Department

The City of Houston contracts with the Houston Parks Board to conduct the land acquisition of the single-family homes on the City's behalf, primarily using CDBG-DR and Harris County Flood Control District funds, with additional gap funding from the Parks Board. The City's Housing and Community Development Department, meanwhile, contacts the owners of the multi-family properties in the floodway. These acquisitions are also primarily funded by the CDBG-DR programs, with some additional funding from HMGP and the City bond measure. These efforts are coordinated by a project manager, reporting to the Office of Recovery. Throughout, the Buy-in/Buyout Task Force maintains open lines of communication with Council members, state representatives, and representatives to Congress.

The Buy-in/Buyout Task Force, which includes a representative from the Houston Parks Board, develops an Affirmative Marketing and Outreach Plan to reach the single-family homeowners and assigns a caseworker to the 70 homes. The caseworker educates homeowners about the buyout program, including new policies around the National Flood Insurance Program and the right of first refusal. City and County officials hold community meetings to discuss the future vision of Greenspoint, and the caseworker follows up with one-on-one meetings and phone calls.

When disaster strikes, the caseworker immediately contacts homeowners to offer support and explain their options. Because of reforms to the National Flood Insurance Program, owners whose homes experience severe damage are able to receive checks for the pre-flood value of their home within weeks. Caseworkers continue to engage owners whose homes experience less than severe damage, reminding them to preserve their receipts on repairs to prove they have not received any duplication of benefits if they later decide to participate in the buyout program. The newly enacted ordinance regarding the right of first refusal further incentivizes these owners to sell to the City.



### **Ideal Phase 2: Relocation**

During the acquisition phase and in preparation for the relocation phase, the Housing and Community Development Department continues to build affordable housing rental units in undeveloped parcels that are in the Greater Greenspoint Management District but outside the floodplain. The Buy-in/Buyout Task Force adopts the plan proposed by the Greater Houston Flood Mitigation Consortium suggesting which undeveloped parcels to be used, pictured below (GHFMC, 2019b).

Funding for these housing developments comes from the CDBG program, private investments, and Low-Income Housing Tax Credits. As each multi-family property is purchased by the City, the new affordable housing units come online. Caseworkers work with renters to explain Uniform Relocation Act assistance, tour the new affordable housing units with them, and walk them through the application process.

While homeowners do not receive federal relocation assistance, caseworkers check in with them to remind them of financial incentives to relocate together and stay within the Greater Greenspoint Management District. Caseworkers also inform homeowners of any local policies that can “plus up” their federal assistance.

### **Ideal Phase 3: Restoration**

As single-family homes are bought out, Houston’s Public Works Department works with the Parks Board and Harris County Flood Control District to design the greenspace, with input from the Parks and Recreation Department, which will administer the park after its development. The Buy-in/Buyout Task Force also invites public comment on the bayou park plan. Demolition begins on the east side of the pictured bayou as more land is made available. Public Works also begins work scouring out the bayou banks through excavation to reduce the floodplain area.

Because this section of the Greater Greenspoint Management District is within both an Opportunity Zone and a Tax Increment Reinvestment Zone, it is ideally situated for commercial and residential development. The favorable tax environment attracts corporate and private investors, and any increase in property taxes will be reinvested in the area. During the acquisition and relocation phases, the Mayor’s Office of Economic Development identifies several corporations and private investors who will partner with the City to develop the area after the habitable structures in the floodway are removed. Additional funding is sourced from the City’s drainage fees and code violation penalties.

Within ten years, the area’s transformation into the “gateway of Houston” is complete: it functions as a large-scale connector to the airport, Houston’s major highways, and a new light-rail and bus rapid transit system. New businesses revitalize the site of the former Greenspoint Mall, and mixed-use and -income housing developments serve residents in all stages of life. And Marta, living in a nearby home built for resilience, brings her daughters to the new bayou park to run, play, and view the warblers and shorebirds that use the Greens Bayou Park as a “flyway” during their seasonal migrations.

# Conclusion

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Houston has a commitment to re-build differently – to adapt to the demands of a changing climate and prioritize human flourishing for all residents before the next flood comes.

Houston has a vibrant ecosystem of academic researchers, community and business leaders, non-profit organizations, and government officials contributing to an overarching commitment to a resilient Houston. This report adds to that ecosystem by dramatically narrowing the focus to managed retreat, while acknowledging that managed retreat is just one piece of the greater resilience vision.

The best buyout programs have strong political, equity, and outreach lenses in service to broader community goals. In drawing out learnings from peer cities, literature reviews, and interviews with existing program managers, we have applied best practices for Houston to become a leader in buy-in/buyout programs. We envision and recommend a governance structure that internalizes resilience, a buy-in/buyout program that keeps the resident at the center, and advocacy for long-term policy reforms.

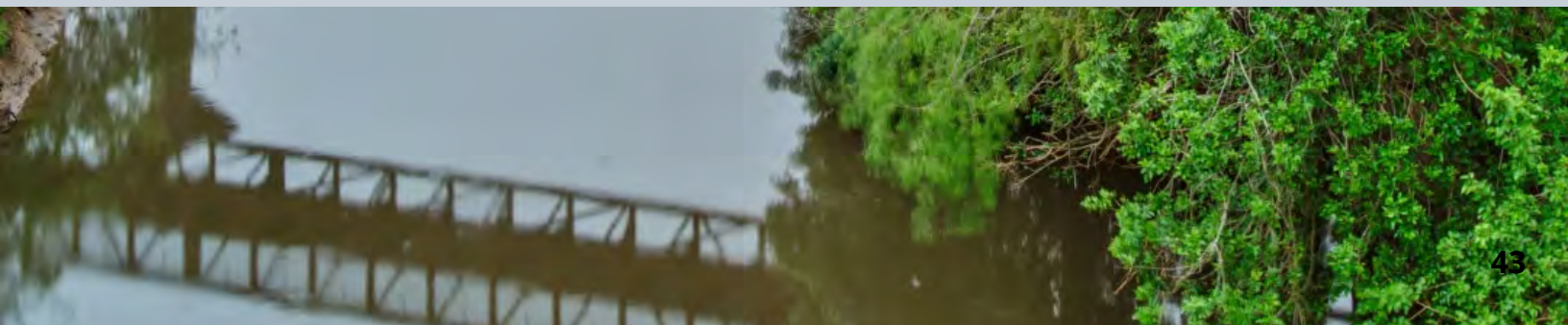
We hope this report proves useful to the City as it builds toward a future that is equitable, prosperous, and accessible for all.

*Opposite: View from the Studemont Bridge over Buffalo Bayou (Credit: Silvio Ligutti via Getty Images)*





# Appendices





# Appendix 1

## Understanding Houston Buyout Programs and Funding Sources

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### Existing Buyout Programs in Houston and Harris County

#### **Harris County Flood Control District**

Beginning in 1985 and accelerating after Tropical Storm Allison in 2001, Harris County Flood Control has one of the most mature buy-out programs in the country. Over three thousand structures in Harris County have been bought through various federal and local funds, 80% of which are within City of Houston boundaries. Over two thousand structures have been purchased with Federal Emergency Management Agency (FEMA) grants; 960 properties with Flood Control District funds; and 30 structures with Corps of Engineers funds. HCFCD has returned 1,100 acres to their natural function as a flood plain, avoiding millions of dollars in flood damages. HCFCD has also conducted single-family buyouts on the City of Houston's behalf. As of January 2020, HCFCD has used \$3 million out of a \$10 million bucket of federal funding allocated to the City for flood events that occurred in 2015 (HCDD, personal communication, January 21, 2020).

Homes are eligible for buyouts if the flooding was caused by a waterway within HCFCD's jurisdiction; if the home is deep within a floodplain and has experienced repetitive flooding; if the buyout would be cost-effective; if there is potential for future floodplain preservation or flood damage reduction; and if it is compatible with community and natural values. While HCFCD has policies in place to acquire multi-family properties, all of its Hazard Mitigation Grant Program funds have been used on single-family acquisitions (Patterson, 2018).

HCFCD uses a combination of in-house and contract employees. Contractors include buyout counselors, appraisers, title companies, and demolition contractors, in addition to contractors that augment in-house right-of-way and relocation agents as necessary. HCFCD also appraises homes based on their pre-flood fair market value, which necessitates a "Duplication of Benefits" determination. This is used to avoid using tax dollars to provide the same benefits more than once. For example, if an owner receives disaster assistance to repair their home and does not use the money for that purpose, then that amount must be deducted from the value of the home.

HCFCD has found that homeowners are more confused by the duplication of benefits determination than any other aspect of the post-disaster buyout process (Property Acquisition Services Section, 2005). Buyout counseling meetings are crucial for owners to understand the process. Owners must be notified immediately after a disaster that a buyout program is available, that minimal repairs should be done, and that they must keep their paperwork and receipts.

Even with HCFCD’s substantial experience and capacity, a typical buyout takes eight to twelve months “to even get started,” and may take an additional few years to complete (Harris County Flood Control District, 2020). The below diagram illustrates HCFCD’s buyouts during and after Hurricane Harvey.



### City of Houston: Public Works Department

The Public Works Department uses FEMA’s Hazard Mitigation Grant Program funding to implement a variety of mitigation projects, including buyouts of single-family properties in the floodway and 100-year floodplain. Scaling the number of buyouts, however, has been particularly challenging: in 2018-2019, Public Works made two applications to FEMA for buyouts, for a total of seven homes—and one application will likely be approved (Houston Public Works Department, personal communication, January 23, 2020). Public Works is hampered by several factors: apparent lack of interest in buyouts, prioritization of clusters of homes adjacent to infrastructure projects, and federal timing and restrictions. The vast majority of the HMGP funding has been used for home elevations rather than buyouts.

After Hurricane Harvey, Public Works sent out an interest form that informed residents of their three mitigation options under FEMA: elevation, buyout, or mitigation reconstruction. Over 800 hundred people responded, but less than 10% were interested in buyouts. Those who wanted buyouts were spread out all over the City, rather than clustered in one area (Houston Public Works Department, personal communication, January 23, 2020). One particular neighborhood ably illustrates residents’ apparent disinterest in buyouts: Public Works sent out mailers to everyone in that neighborhood, inviting them to a public meeting, and a consultant went door-to-door. Not one person attended the meeting. Three people submitted applications—but for home elevations, not buyouts. Residents may have been disinterested because they were renters, or because of a lack of details around the potential offer they would receive or available relocation assistance.

In addition to residents' apparent disinterest, Public Works prioritizes clusters of homes that are located near a Harris County Flood Control District (HCFCD) or Public Works infrastructure project. Public Works has identified and mapped the properties in the floodway, including distinctions between residential, commercial, and industrial properties, and adjacencies to potential capital improvement projects. These infrastructure projects are meant to mitigate flooding in surrounding neighborhoods and are determined after analyzing the overarching flow of water through the bayous. Where appropriate, properties looking for home elevation assistance in the future will be informed that buyouts are the only mitigation option available to them. Public Works also prioritizes clusters of homes to avoid creating a detrimental "checkerboard" effect in the neighborhood.

Finally, Public Works is subject to federal limitations around timing and cost-benefit analysis. Properties may be purchased only if the cost of repairs exceeds the value of the property. Additionally, the timing of federal funding is very slow; the funding for HMGP was not announced until seven months after Hurricane Harvey occurred, and applications typically take an additional year or more to be approved and awarded. In that time, most owners have repaired their homes or sold to a developer or new owner. As the buyout program expands, Public Works intends to intensify coordination with HCFCD, the Housing and Community Development Department, and Parks.

### **City of Houston: Housing and Community Development Department**

The Housing and Community Development Department (HCDD) uses funding from the Department of Housing and Urban Development to run three buyout programs, each associated with a disaster year. HCDD has focused on multi-family structures because Harris County Flood Control District (HCFCD) has received substantial funding to administer its buyout program, which has historically focused on single-family homes. In projects with HCFCD as lead, HCDD provides supplemental funding for acquisition, relocation, and demolition. Of the \$10 million granted for the 2015 disaster year, \$3 million has been spent.

For buyout programs associated with the 2016 and 2017 disaster years, HCDD provides the majority of the funding for acquisition. For the 2016 disaster year, HCDD has been allocated \$23 million to remove approximately 250 single-family or multifamily units from high flood risk areas, and has been allocated \$40.8 million for the 2017 disaster year (Texas GLO, 2020). HCDD has developed a draft manual on multi-family buyouts, which includes Uniform Relocation Act requirements. As of January 2020, HCDD is in the process of contracting with a non-profit organization that will provide relocation services for tenants, which includes assisting tenants in calculating the amount of assistance they will receive, and may assist with finding a new home.

In collaboration with Public Works, HCDD prioritizes properties that supplement Public Works or HCFCD infrastructure projects, have experienced repetitive or severe repetitive loss, are in low- to median-income areas, and are clustered together. As a result, HCDD will target specific multi-family properties rather than blanketing an area with marketing and outreach.

HCDD is also charged with developing affordable housing more broadly, using Community Development Block Grant funds. Where possible, HCDD attempts to coordinate the availability of new affordable housing units with residents who need to relocate, but construction timelines make such coordination extremely difficult.

## **Houston Parks Board**

Founded in 1976, the Houston Parks Board is non-profit organization with local government corporation status, a unique structure that allows the Parks Board to act as an agent for the City of Houston. The Parks Board has acquired nearly one thousand acres along the bayous, with two full-time employees working on land acquisition, including outreach, negotiation, and closing across a variety of properties—residential, single-family without clear title, and commercial. After determining which parcels along the nine targeted bayous needed to be acquired and who owned them, the Parks Board created a community engagement and communications protocol. They were proactive in working with civic and neighborhood associations, council members, and property owners, and provided translation services to ensure all members of the community could be represented.

While the Parks Board works in conjunction with the City and with Harris County Flood Control District (HCFCD), it does have more flexibility in timing and in using funding to help “make homeowners whole,” or recoup the total cost of relocation, including the value of the property. After the acquisition, the Parks Board typically turns over the asset to the City. In addition to acquiring the properties outright, the Parks Board can also close funding gaps for City acquisitions.

The Parks Board uses funding from a number of sources for land acquisition, the bulk of which is private donations. In 2012, for example, the voters in Houston passed a \$100 million bond for Bayou Greenways 2020, a 150-mile system of parks and trails along nine of Houston’s major bayous. The Houston Parks Board committed to raising a capital campaign to match that amount, ultimately surpassing the match to raise \$120 million. Some amount of the capital raised by the Houston Parks Board was earmarked for land acquisition.

The Houston Parks Board also receives funding for the conservation and maintenance of Bayou Greenways 2020 through a Section 380 agreement with the City, which transfers revenues from property tax increments in a particular zone to the Parks Board. Lastly, the Parks Board received a \$70 million grant in federal funding from the RESTORE Act, which disburses money from the BP oil spill settlement. (The Parks Board has also applied to FEMA for buyouts to augment the City and County’s work, but those applications have been denied.) The Parks Board chooses which funding source to use for each parcel, with the understanding that private funds provide significant flexibility (B. White, personal communication, March 11, 2020).

## Existing Funding Sources for Buyouts in Houston

### County Funds

The City of Houston benefits from Harris County funding when the funding is used for infrastructure projects in the City, which may include acquisitions. A year after Hurricane Harvey, Harris County voters approved a \$2.5 billion flood damage reduction bond, gaining the support of 85% of voters to spend the money guided by principles of equity. This bond measure will fund about 237 flood damage reduction projects in the Houston area (HCFCD, 2020a). The bonds will be sold in increments over at least 10-15 years, as funding is needed for projects to move forward. Several projects will be completed as a partnership between the City of Houston and the Harris County Flood Control District. \$32.5 million, for example, has been allocated for the planning, right-of-way acquisition, design, and construction of channel improvements on Keegans Bayou (HCFCD, 2018). The City of Houston has also historically benefitted from Harris County funding immediately after a disaster. For example, the Harris County Engineering Department was allocated \$20 million of County funds to conduct buyouts directly after Hurricane Harvey; some of those buyouts occurred within the City of Houston.

### Federal Funds

Federal funding comes from the Department of Housing and Urban Development (HUD) and the Federal Emergency Management Agency (FEMA). Typically, the funding comes through federal appropriations via the Stafford Disaster Relief and Emergency Assistance Act and is administered through the Texas Land Agency to be managed by different municipalities, including Harris County and City of Houston. To be eligible for federal funds, buyouts must be voluntary exchanges between a property owner and the government. The government can then decide whether to demolish the property and return the land to its original use or develop flood mitigation infrastructure, but the land can never be developed for commercial or residential use.

HUD administers the Community Development Block Grant (CDBG), a yearly grant that is intended to ensure affordable housing, provide services, and create jobs (HUD, 2019). It is categorized as a “block grant” because it is a sum of money that is subject to fewer federal regulations, allowing states relative flexibility in administering the funds. The amount of funding allocated to Houston is determined on a yearly basis by a HUD formula that incorporates multiple measures of need (HUD, 2019). In 2019, for example, the City of Houston was awarded \$23.9M in CDBG funds (HUD, 2020). The CDBG program also has two sub-grants: CDBG-DR (Disaster Recovery) and CDBG-MIT (Mitigation). These grants are awarded on an as-needed basis.

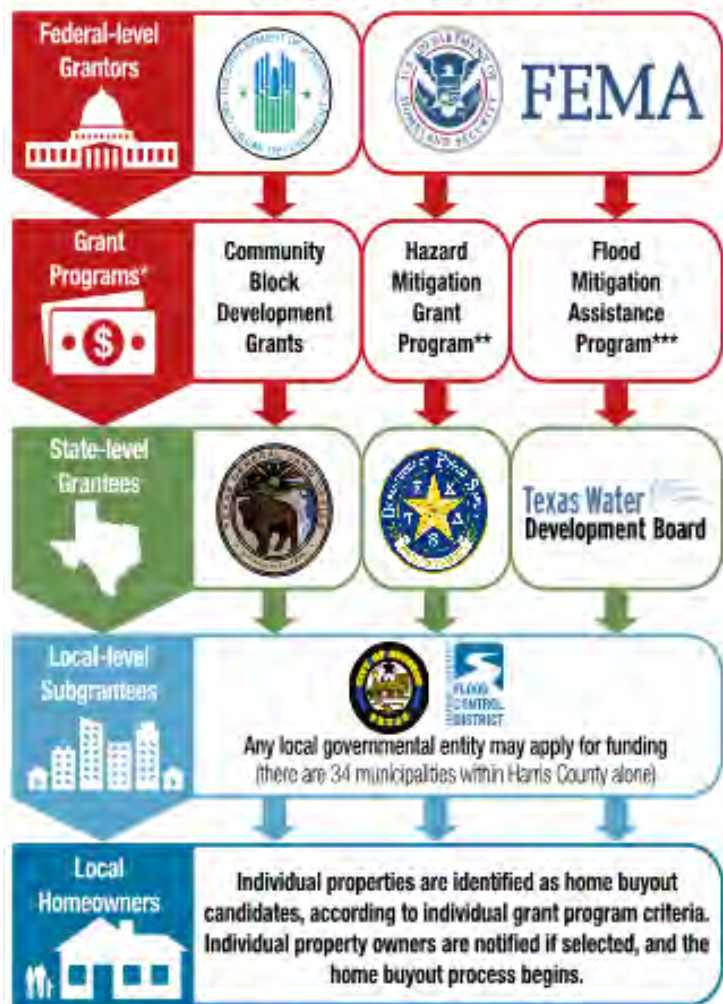


After an event is designated a Presidentially Declared Disaster, Congress appropriates special funds for the CDBG-DR program. HUD announces the allocations, publishes a Notice in the Federal Register, and awards the funds. HUD may award funds directly to a local government or to a state, which in turn administers or distributes the funds (HUD, 2018). For the 2015, 2016, and 2017 disasters, the City of Houston was allocated about \$1.4 billion through the CDBG-DR program. About \$75 million was directly allocated to a buyout program. This funding is subject to regulations outlined by the various applicable Action Plans submitted by the City of Houston. Administrative costs are capped by the Texas General Land Office.

Similarly, HUD may allocate funding through the CDBG-MIT program directly to a local government or through a state. For the 2015 events, the City of Houston was directly allocated \$61.9 million. For the 2016 and 2017 events, HUD allocated funding to the Texas General Land Office, a state agency. The City of Houston may receive funding by submitting proposals to the state-wide competitions for the 2016 and 2017 events (it is ineligible for the 2015 competition). It may also receive funding through the Regional Mitigation Program, if it is allocated funding through its Area Council, and/or the Coastal Resiliency Program.

FEMA administers five subprograms: Hazard Mitigation Grant Program, Flood Mitigation Assistance, Pre-Disaster Mitigation, Repetitive Flood Claims, and Severe Repetitive Loss. Funds from all of these programs may be used for acquisition and demolition of properties.

### How is home buyout funding allocated to individual property owners?



\* Each grant program is associated with its own objectives and eligibility criteria.

\*\* The Hazard Mitigation Grant Program (HMG) is only available following a Presidential-declared disaster (i.e. Hurricane Harvey).

\*\*\* The Flood Mitigation Assistance Program (FMA) grant uses funds allocated by the NFP from the proceeds of flood insurance. FMA grants are awarded annually, and the Flood Control District must compete with all other communities nationwide for these grants. These grants are not guaranteed.

Hazard Mitigation Grant Program (HMGP) funds are disbursed after an event is declared a Major Disaster by the president. Unlike the CDBG grants, each project must be individually approved by the state agency that administers the funding, the Texas Division of Emergency Management. These include large-scale projects as well as individual home mitigation projects, which includes buyouts, elevations, demolition, and rebuilding. HMGP funds provide up to 75% of eligible costs for mitigation projects, with local entities providing the other 25%. Some federal funds, like the CDBG-DR, may be used to provide the local match, but there are limitations. Additionally, FEMA does not allow for reimbursement of costs incurred before grant approval, including property and right-of-way acquisition. Though FEMA has the authority to waive this restriction, it has not yet done so for the City of Houston and it may be restricted in its ability to allow grantees to acquire property (Costello, 2019).

The Flood Mitigation Assistance program provides funds to mitigate properties insured by the National Flood Insurance Program. For buyouts in particular, FEMA provides 100% of eligible costs for homes categorized as “Severe Repetitive Loss,” 90% for homes categorized as “Repetitive Loss,” and 75% for homes categorized as neither (FEMA, 2016).

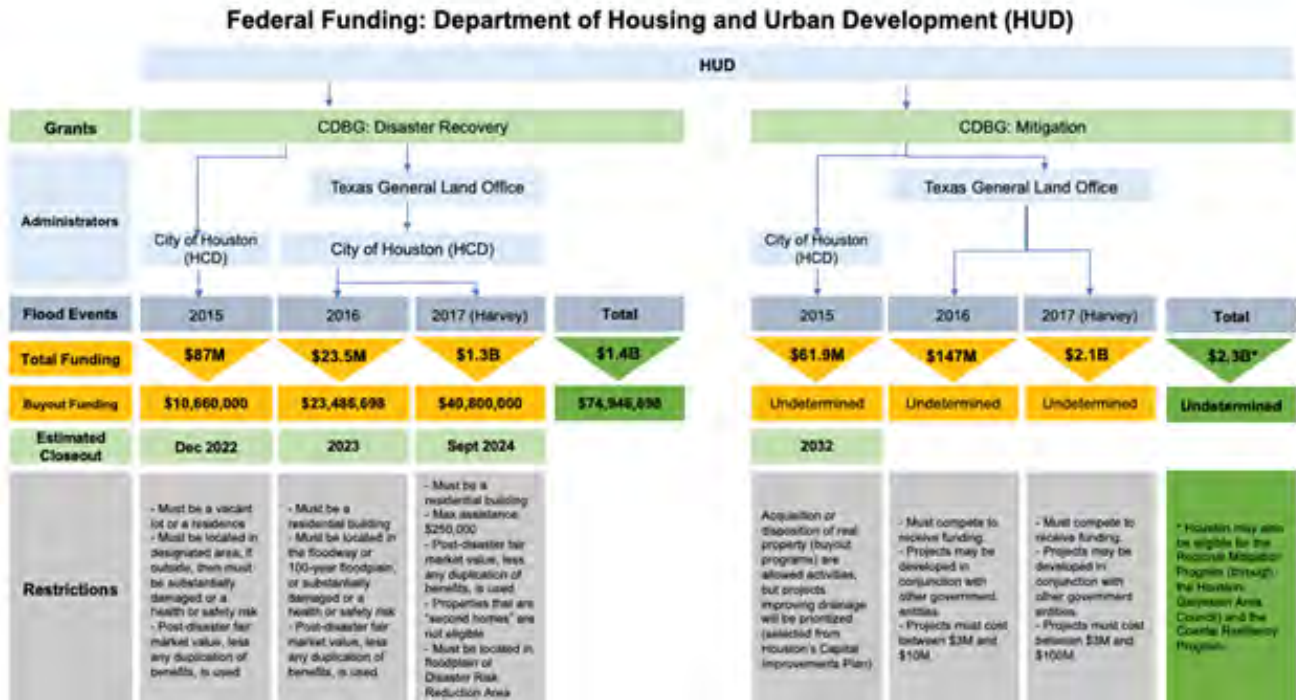
Pre-Disaster Mitigation funds are allocated annually by congressional appropriation. Repetitive Flood Claims and Severe Repetitive Loss funds apply to properties that have had multiple flood insurance claims, with the goal of reducing flood damages to properties that are insured by the NFIP (Patterson, 2018).

### General Overview of Federal Funding Sources and Restrictions (Siders, 2019)

Table 1 Sources of and restrictions on federal funding for floodplain acquisition

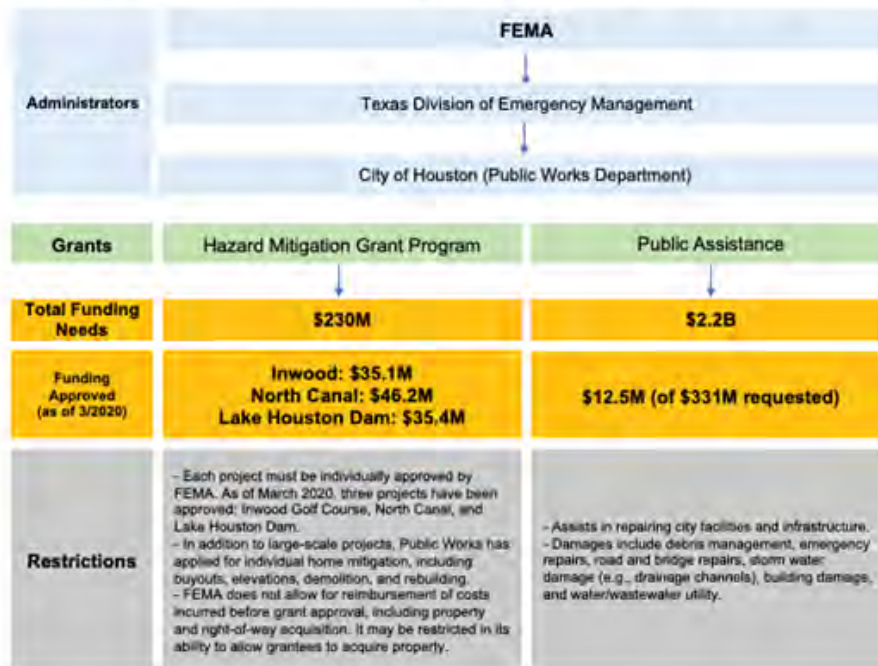
Source	Type	Federal contribution	Post-acquisition deed restrictions	Other restrictions	Legal authority	Purchase price	
FEMA	HMGP	Voluntary	75% of project cost; other 25% from non-FEMA sources	Acquired properties deed-restricted for open space, recreational, or wetlands management in perpetuity; properties may not be sold or transferred to private ownership		Robert T. Stafford Disaster Relief and Emergency Assistance Act; National Flood Insurance Act; CFR 44 Part 80, Property Acquisition and Relocation for Open Space	Pre-disaster fair market value (FM) (possible incentive or relocation bonuses)
HUD	CDBG	Voluntary or non-voluntary	25% match paired with FEMA as cost-share or up to 100% independent	No deed restrictions; redevelopment possible	70% of CDBG funds expended must benefit low- to moderate-income persons (LMI)	Housing and Community Development Act (HCDA); Uniform Relocation Assistance and Real Property Acquisition Policies Act (URA)	Pre- or post-disaster FMV (possible incentive or relocation bonus)
	CDBG-DR	Voluntary	25% match paired with FEMA as cost-share or up to 100% independent	Within 100-year floodplain: deed-restricted to remain undeveloped; may be sold or transferred to private owner with deed restrictions; outside 100-year floodplain: no deed restriction required; redevelopment possible	Appropriation may reduce or waive LMI requirements	Disaster Relief Appropriations Act (Specific to each disaster: allows HUD to waive HCDA provisions and add alternatives to tailor to specific disaster recovery needs)	Pre- or post-disaster FMV (possible incentive or relocation bonus)

# Overview of Houston's Federal Funding Sources and Restrictions: HUD



# Overview of Houston's Federal Funding Sources and Restrictions: FEMA

## Federal Funding: Federal Emergency Management Agency (FEMA)





# Appendix 2

## Best Practices from the New York Governor’s Office of Storm Recovery (NY GOSR, 2017)

As the events of the last few months have demonstrated, disasters can pose very different threats, requiring very different emergency response and long-term recovery strategies. While there is no one size fits all recovery program, there are some universal lessons to be learned from responses to past disasters. Five years after Superstorm Sandy caused unprecedented damage to the northeast, and four years after GOSR was established to maximize the coordination of recovery efforts in New York State, we offer some of these best practices, gleaned from our own experiences.

### 1. Centralize interagency coordination to enhance program effectiveness.

GOSR is managing the disbursement of more than \$4.5 billion in funds allocated as part of the CDBG-DR program administered by the U.S. Department of Housing and Urban Development and aimed at disaster relief and long-term recovery. Because CDBG-DR funds are allocated through these supplemental (and not annual) appropriations — and because of the very nature of disasters — the budgeting process can create a unique environment that prompts recipients to make many managerial and administrative decisions in quick succession. As such, grantees may choose to nest oversight internally via an existing office or agency, or opt to create a new stand alone office to specialize in grant administration. Through the establishment of GOSR, New York State pursued the latter of these two options. Using GOSR as the vehicle to drive recovery and resiliency, New York State is promoting the existence of centralized and specialized administrative capacity, as well as a deeper focus on meeting numerous regulatory and geographic constraints specific to this funding source. Thus, our programs can better coordinate with each other and with key stakeholders to respond to new challenges and barriers inherent in any recovery.

### 2. Planning for vulnerabilities and risks is essential to a long-term recovery and includes strong community input.

*Rebuilding without consideration of assets, hazards, vulnerabilities, and risks dooms communities to cycles of devastating and repetitive loss, and is not a pragmatic way to invest precious and limited disaster recovery resources.* Within the disaster recovery field, academics and practitioners are increasingly highlighting New York’s focus on long-term resiliency, especially in the context of the increasing strains that climate change will place on our communities. We feel strongly that the path to true resiliency, therefore, must go through a collaborative planning process that unites local knowledge and expertise about community assets with a deep technical understanding of hazards, vulnerabilities and risks.



## **Appendix 3**

All Buyout Programs as of 2017 (NY GOSR, 2017b)

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# Appendix 4

## Stock-and-Flow Diagram of Residents in the Floodway

A stock-and-flow systems map of the floodway illustrates how the City can intervene to end the cycle of destruction and rebuilding. This map is helpful for making explicit the mental models of actors and structural dynamics.

Within the Resilient Houston Strategy, the goal of removing all habitable structures in the floodway can be translated into residents by multiplying the estimated structures by the average household size in Houston (2.67 residents per unit). As there are 6,174 documented multi-family units in the floodway, we conservatively estimate 7,000 total residential units in the floodway (GHFMC, 2019a).

The estimated population of 18,690 residents in the floodway can be diminished or increased only by examining the flows in and out of that pattern. Most commonly understood through an analogy of a bathtub, a stock is the existing water in a bathtub; the inflow is the rate of water delivered by turning the faucet dial; the outflow is rate of water leaving through the drain. In understanding the factors that affect the inflow and outflow, we can see all the policy options available to the City for intervention.



# Appendix 5

## List of LMI ZIP Codes (HCDD, 2019)

This list of ZIP codes was developed by Houston’s Housing and Community Development Department for the Homeowner Assistance Program.



### Homeowner Assistance Program Situation and Pipeline Report #1 August 28, 2019

#### Canvassing Report as of August 28th

A team of canvassers knocks on doors in low- and moderate-income neighborhoods to encourage residents to take the survey.

Zip Codes	Count of Knocks
77004	1,154
77007	411
77008	700
77009	2,333
77011	1,170
77012	3,483
77013	2,498
77015	4,323
77016	3,768
77017	5,344
77018	197
77021	1,620
77022	2,010
77023	1,309
77024	38
77025	6,936
77026	1,207
77028	2,316
77029	1,427
77030	486
77031	691
77033	3,779

Zip Codes	Count of Knocks
77034	7,698
77035	2,633
77037	916
77040	1,685
77042	1,782
77043	613
77045	2,491
77047	13
77048	2,141
77049	636
77051	5,301
77056	604
77057	581
77060	63
77061	302
77063	355
77067	73
77071	1,377
77072	223
77074	1,056
77075	4,858
77076	462

Zip Codes	Count of Knocks
77077	2,737
77079	1,859
77080	222
77082	332
77087	4,912
77088	2,678
77089	5,440
77091	1,871
77092	818
77093	566
77096	7,174
77336	958
77339	796
77345	1,317
77346	125
Jan/Feb*	65,628
<b>Grand Total</b>	<b>180,496</b>

*\*Zip code data was not consistently collected in January and February 2019.*



Canvassers wear red polo shirts with the Build It Forward logo and carry tablets.

# Appendix 6

## The Uniform Relocation Act (URA)

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The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, also known as the Uniform Relocation Act (URA) (1987)

### **The URA seeks to:**

- (1) provide uniform, fair, and equitable treatment of persons whose real property is acquired or who are displaced in connection with federally funded projects;
- (2) ensure relocation assistance is provided to displaced persons to lessen the emotional and financial impact of displacement;
- (3) ensure that no individual or family is displaced unless decent, safe, and sanitary housing is available within the displaced person's financial means;
- (4) help improve the housing conditions of displaced persons living in substandard housing; and
- (5) make it easier for public agencies to acquire displaced persons' property by agreement and without coercion. (United States Department of Housing and Urban Development 2015a)

### **The URA pursues the last objective by outlining the following public agency responsibilities:**

- (1) appraising property before negotiations;
- (2) inviting the property owner to accompany the appraiser during the property inspection;
- (3) providing the owner with a written offer of just compensation and a summary of what the new owner is acquiring;
- (4) paying for property before possession; and
- (5) reimbursing expenses resulting from the transfer of title, such as recording fees and prepaid real estate taxes.

### **Acquisitions that cause residents to be displaced must meet the following requirements:**

- (1) provide relocation-advisory services to displaced tenants and owner-occupants;
- (2) provide a minimum ninety days' written notice to vacate prior to taking possession;
- (3) reimbursing moving expenses; and
- (4) providing payments for the added cost of renting or purchasing comparable replacement housing. (United States Department of Housing and Urban Development 2015a)

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