



HARRIS COUNTY  
**COMMUNITY FLOOD  
RESILIENCE TASK FORCE**

YEARLY REPORT  
TO COMMISSIONERS COURT

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**2022**

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Community Flood Resilience Task Force  
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June 10, 2022

**Harris County Commissioners Court**  
1001 Preston St. Suite 934  
Houston, TX 77002

Dear County Judge and Commissioners,

The Community Flood Resilience Task Force (CFRTF) is pleased to provide you with the enclosed yearly report, which outlines the key accomplishments and deliverables of the group over the first year of its existence. We continue to applaud the work of the Court in ensuring the involvement of community voices and subject matter experts in service of the County's equitable flood resilience efforts.

The report outlines our role in these efforts, our vision for the 2050 Flood Resilience Plan, and what we plan to accomplish over the next 12 months in service to this work.

These efforts are critically important and **we look to Harris County to fully commit to them and:**

- ◇ Appropriate funding over the next two years for the preparation of the 2050 Flood Resilience Plan;
- ◇ Appropriate funding for the robust stakeholder engagement necessary to make it community-driven; and
- ◇ Ensure that the Infrastructure Resilience Team (IRT) has the tools and systems necessary to collaboratively prepare the 2050 Flood Resilience Plan, including the identification of innovative methods and best practices from other parts of the country that can be utilized in our region.

These financial and organizational resources are critical to the ultimate success and impact of the County's flood resilience efforts.

We, the Executive Committee, are pleased for the Task Force to have delivered such valuable work to the County within its first year, and look to continue our impact in the future.

Sincerely,

A handwritten signature in black ink that reads "Kenneth Williams".

**Ken Williams**  
Task Force Chair

A handwritten signature in black ink that reads "Elaine Morales-Diaz".

**Elaine Morales-Diaz**  
Vice-Chair

A handwritten signature in black ink that reads "Yasmeen Davila".

**Yasmeen Davila**  
Secretary

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# EXECUTIVE SUMMARY

**The Community Flood Resilience Task Force (CFRTF) is a multidisciplinary, community-driven 17-member body established to advise Harris County on equitable flood resilience planning and projects that take into account the needs and priorities of communities.**


We see our advisory role as twofold. First, we provide subject matter expertise on the full scope of resilience. As subject matter experts we provide recommendations on best practices to Harris County departments to help in the development of innovative and forward-thinking flood resilience planning. Second, we amplify and support the voices of communities who may not be subject matter experts, but are experts in their lived experience. While we know that people at the County are working hard to prevent flooding, we recognize that the community has often felt unheard and uninformed by government agencies. However, we feel that this **time is different**, and we hope that Harris County Commissioners Court, County Administrator's Office, and County Infrastructure Resilience Team (IRT) departments feel the same.

## Over the past year

We have provided **four significant deliverables** to Harris County related to how the County prioritizes funding for flood resilience projects, how we can better understand inequitable mitigation investments, and our future direction.

- ◇ 2022 Prioritization Framework Recommendations
- ◇ Flood Mitigation Benefit Index (FMBI)
- ◇ Infrastructure Resilience Team (IRT) Workshops
- ◇ Flood Resilience Repository

*A key contribution  
of the Task Force*



*More information about these can be found in our Year One Work and the Appendix.*



## Over the next year

We plan to build upon these efforts and:

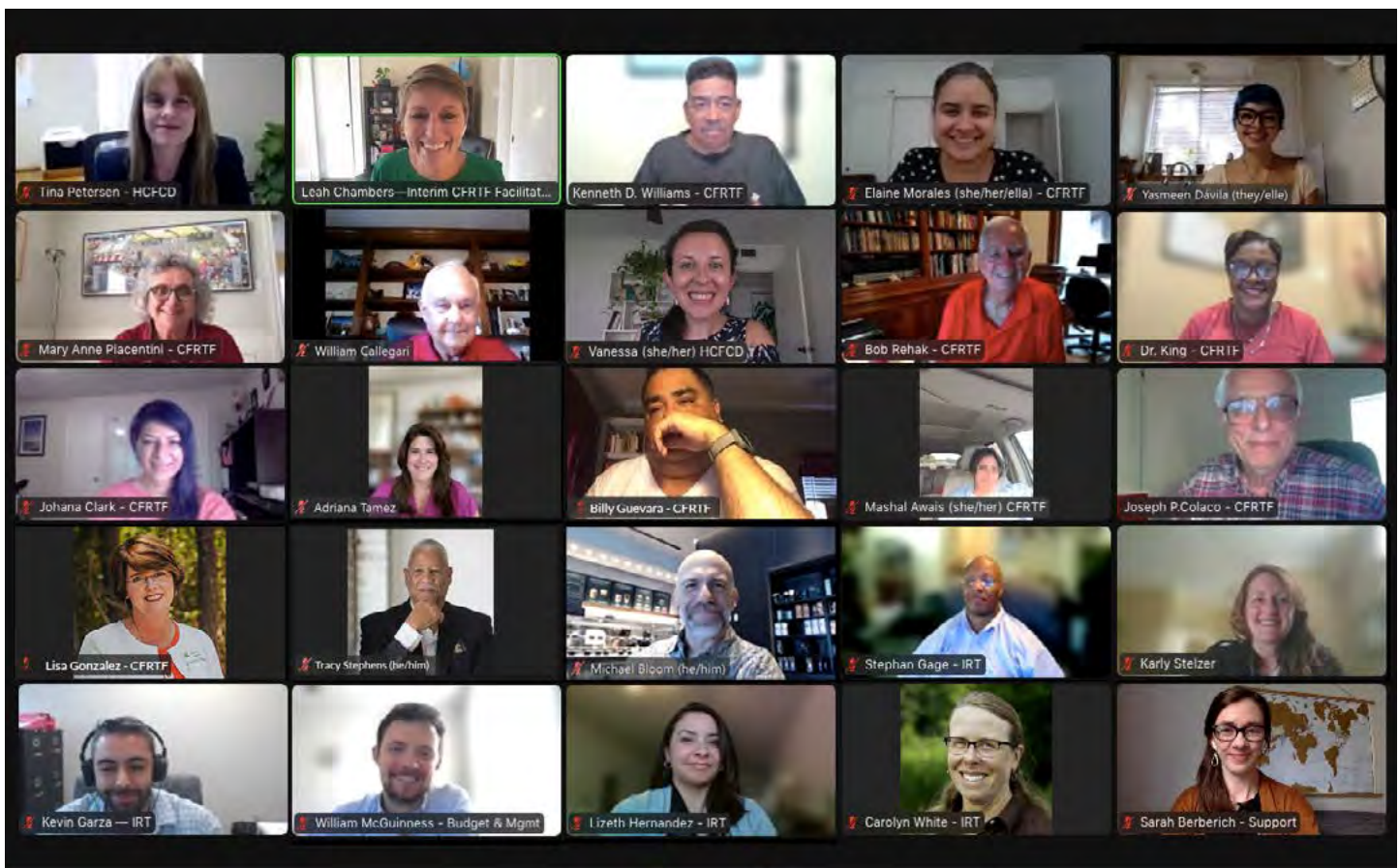
- ◇ Advise Harris County on the **Preliminary Flood Resilience Report** and the development of the **2050 Flood Resilience Plan**, specifically around the baseline conditions, approaches, funding, and community engagement.
- ◇ Continue to provide input to the Harris County Community Services Department (HCCSD) on the **\$750M CDBG-MIT Method of Distribution**
- ◇ Collaborate with the Harris County Flood Control District (HCFCD) and Infrastructure Resilience Team (IRT) to calculate the **Flood Mitigation Benefit Index (FMBI)** and evaluate the results
- ◇ Begin liaising with communities to **build capacity to influence flood resilience efforts**

## As Harris County moves forward

We will be looking for a vision for **equitable resilience** that:

- ◇ Offers an integrated understanding of our past flood risk investments and current vulnerabilities that will lead to equitable planning, prioritization, and implementation of future projects.
- ◇ Transforms traditional community engagement into community-driven solutions that have full buy-in from the communities they serve.
- ◇ Develops new and innovative flood risk policies and projects that leverage land preservation, nature-based solutions, and natural infrastructure.
- ◇ Selects and implements flood risk policies and projects using a more bottom up, collaborative, and data-driven approach.

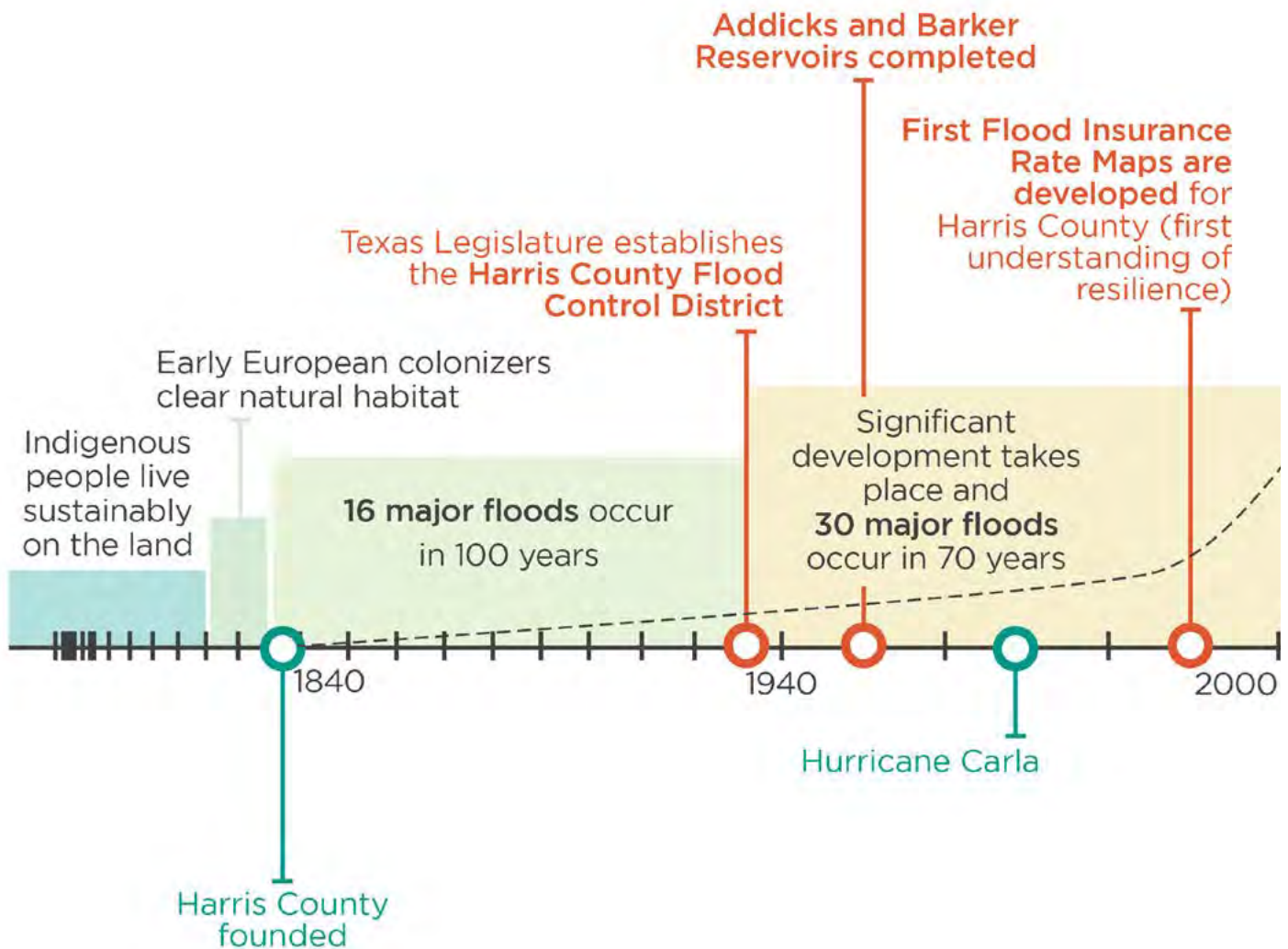
**There is much to do, and we are proud to be an integral part of these important efforts.**



## COLLABORATIONS BETWEEN THE TASK FORCE AND HARRIS COUNTY

The CFRTF, Infrastructure Resilience Team (IRT), and County staff have collaborated heavily to deliver significant results to the County within its first year.

# INTRODUCTION



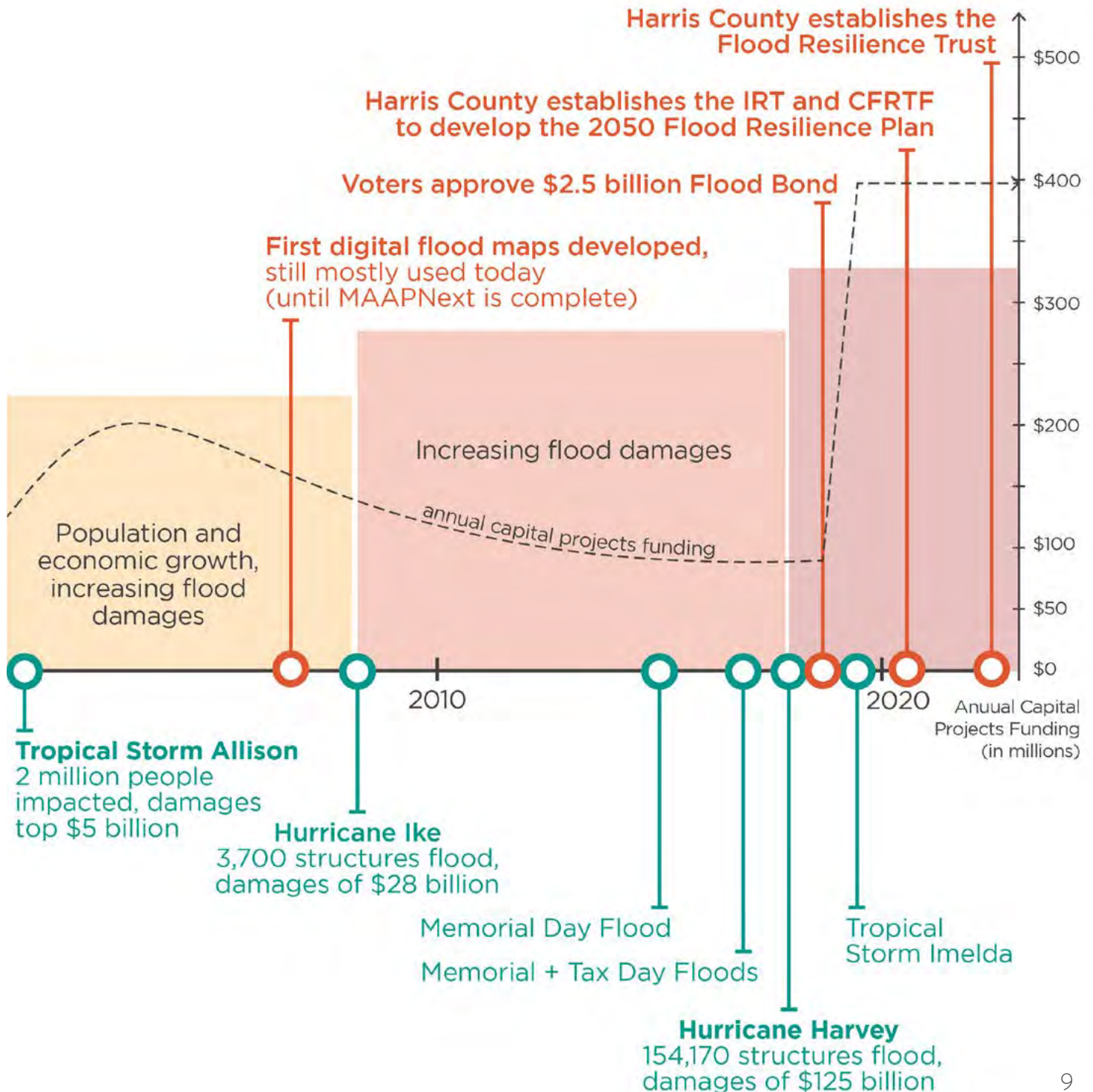
## HISTORY OF FLOODING IN HARRIS COUNTY

This map was prepared by the Facilitation Team to illustrate the change over time in Harris County, in terms of development, flood damages, significant storms, and flood mitigation spending. See Appendix for full-size image.



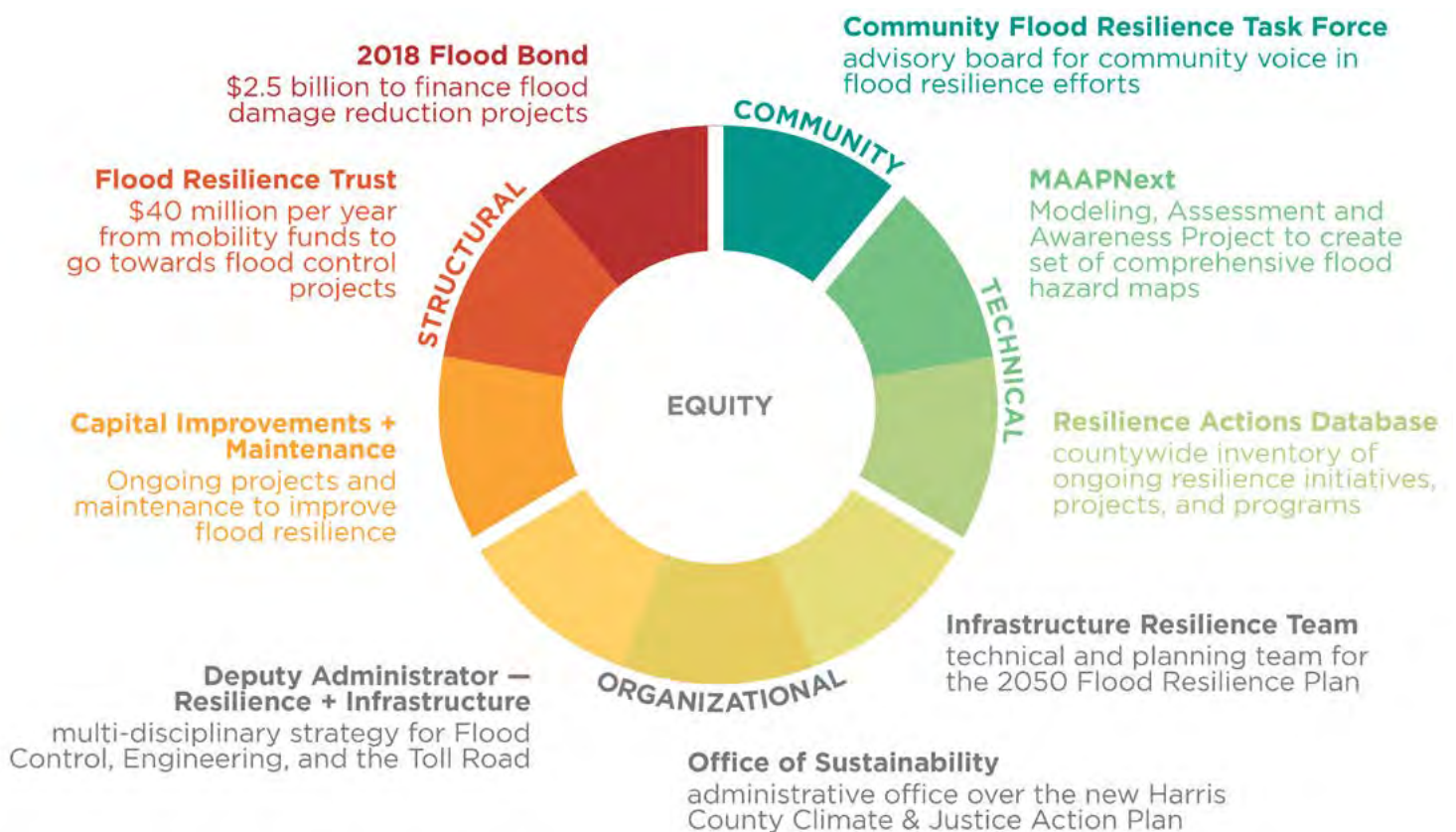
## Flooding is an ongoing threat to the safety and well-being of residents across Harris County.

In 1973 Harris County created the original Flood Control Task Force to help address flooding issues, and in 2020 Harris County Commissioners Court reconstituted the group into the Community Flood Resilience Task Force (CFRTF), to bring more community voice into those efforts. The CFRTF is composed of community representatives and subject-matter experts working to promote equitable, innovative, and nature-based solutions to building flood resilience. The CFRTF works to ensure the perspectives and experiences of diverse and historically excluded communities across Harris County are integral to the development and implementation of Harris County's short- and long-term flood resilience efforts, including the Harris County 2050 Flood Resilience Plan.



## The CFRTF serves in an advisory capacity

to the Infrastructure Resilience Team (IRT), relevant County Department staff, and the Commissioners Court on Harris County's flood resilience planning efforts and activities. They strive to promote collaboration among stakeholders and encourage equitable resilience planning efforts and flood resilience projects.



### HARRIS COUNTY FLOOD RESILIENCE LANDSCAPE

This graphic was prepared by the Facilitation Team to illustrate the array of flood resilience efforts that are currently underway within Harris County. See Appendix for full-size image.

Harris County is currently implementing flood resilience strategies at a range of levels—structural, organizational, technical, and community—all centered around equity. Structural elements include financial mechanisms for locally-controlled funds such as the 2018 Flood Bond and Flood Resilience Trust, as well as ongoing capital improvements and maintenance projects. The organizational framework includes new County structures focusing on resilience, such as the IRT, the Office of Sustainability, and the future Deputy Administrator—Resilience and Infrastructure.

Ongoing technical efforts include the County’s Draft Resilience Actions Database (RAD) and MAAPNext—a Modeling, Assessment, and Awareness Project to create a set of comprehensive flood risk maps. The CFRTF is the community component, providing an empowered community voice into the County’s flood resilience efforts.

Since its formation, this group has worked to build its capacity as an advisory body to Harris County. As such, the available tools in the toolbox are:

- ◇ Release reports with recommendations
- ◇ Release public statements
- ◇ Develop new metrics, tools, or policy
- ◇ Lead collaborative sessions with the Infrastructure Resilience Team,
- ◇ Pilot new strategies
- ◇ Launch a public education program

The work of the CFRTF is carried out through full group meetings, two governing committees, and four thematic committees that meet regularly. The Executive Committee is composed of the Chair, Vice-Chair, and Secretary, who steer the strategic direction of the CFRTF. The Overall Approach Committee advises on the overall approach and work of the County with a set of principles. The Equity + Metrics Committee tackles data and analysis of flood resilience through an equity lens. The Community Engagement Committee steers the way Harris County engages communities on flood resilience efforts and links neighborhoods to solutions. The Finance + Regulatory Committee tackles the need for and solutions to funding and regulatory issues. The Governance Committee tackles issues related to policies and procedures of the group.

Within the past twelve months, the Task Force has convened six official meetings, including a Special Meeting to discuss the 2022 Prioritization Framework per Commissioners Court Request. The four topical Committees have met regularly to establish their workplans and achieve the key deliverables outlined above. The Executive Committee has collaborated with the IRT and Facilitation Team to provide critical leadership in guiding the work of the Task Force.



## **The seventeen (17) members of the CFRTF**

are committed to serving the community, and represent the geographic, gender, age, racial, and ethnic diversity of Harris County. These members are flood survivors, community organizers, engineers, advocates, technical experts, working together to reduce flood risk for all Harris County communities.

These members bring an expanded set of skills (see image to the right with the heading, CFRTF Asset Loteria) that are necessary for shifting Harris County's approach beyond traditional engineering to the full scope of flood resilience. This full set of understanding—from qualitative and quantitative data to nature-based solutions, consensus-building, public health, and community leadership—allows the Task Force to provide holistic feedback on Harris County's ongoing efforts.



### **GATHERINGS**

Task Force members gathered informally in-person several times in order to connect outside the virtual space

# CFRTF ASSET LOTERIA

TABLA 1

				
DISASTER RECOVERY	ENGINEERING	EQUITY + SOCIAL JUSTICE	EQUITY TOOLS	FINANCIAL STRUCTURES
				
FLOOD SURVIVOR	HOUSING	HUMAN IMPACTS OF FLOODING	COMMUNITY LEADERSHIP	MARGINALIZED COMMUNITIES
				
FLOOD RISK MITIGATION	NATURE-BASED SOLUTIONS	URBAN DESIGN + PLANNING	POLICY FRAMEWORK	PUBLIC HEALTH
				
QUALITATIVE DATA	QUANTITATIVE DATA	SUSTAINABILITY	ARTS-BASED PRACTICE	THE TASK FORCE
				
RELATIONSHIP BUILDING	CONSENSUS BUILDING	HUMOR	OUTSIDE THE BOX THINKING	OPEN LISTENER

## CFRTF ASSET LOTERIA

This card was part of a Loteria game created by the Facilitation Team to assist the Task Force members in understanding the diverse assets were needed to further flood resilience in this way, and what each member brought to the work



**EXECUTIVE COMMITTEE**

**AT-LARGE MEMBERS**

**APPOINTED MEMBERS**



**KENNETH WILLIAMS**  
Chair



**SHIRLEY RONQUILLO**  
County Judge's Office



**MASHAL AWAIS**  
Precinct 1



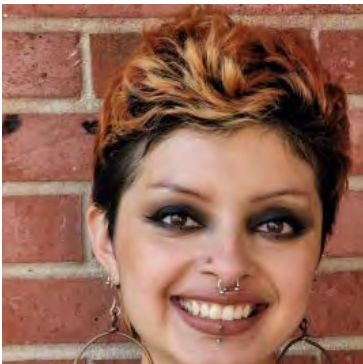
**ELAINE MORALES-DÍAZ**  
Vice Chair



**LISA GONZALEZ**  
Precinct 2



**BOB REHAK**  
Precinct 3



**YASMEEN DÁVILA**  
Secretary  
14



**BILL CALLEGARI**  
Precinct 4



**JOHANA CLARK**  
City of Houston



**MARY ANNE  
PIACENTINI**



**DR. PAMELA  
HERNANDEZ**



**BILLY GUEVARA**



**JOSEPH COLACO**



**DR. DENAE KING**



**ADRIANA TAMEZ**



**TRACY STEPHENS**



**MICHAEL BLOOM**



**DR. EARTHEA  
NANCE**



**LAURA PATIÑO**



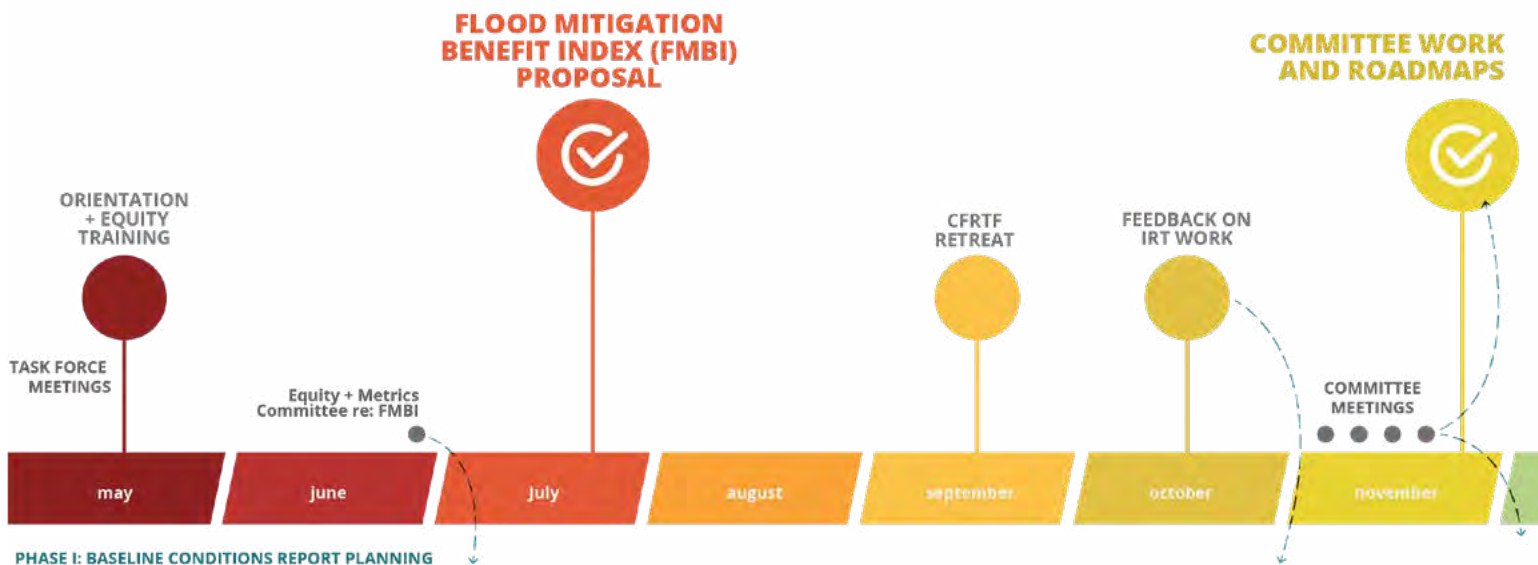
**IRIS GONZALEZ**

**PREVIOUS  
CONTRIBUTORS**

# YEAR ONE WORK

## What we've accomplished this year

Over the last year, the Task Force has worked to honor the directive from Commissioners Court to establish itself as an effective and well-equipped advisory body for Harris County. With the support of the IRT and Interim Facilitation Team we have built a collaborative culture and buy-in, shifting from individual members with personal concerns to collective interests focused on effective change for the broader community. We have elevated the voices of our members to leverage both technical expertise and lived experience to build the collective acumen and capacity of the entire Task Force. We believe that these efforts have created a group that is well-positioned to shape Harris County's efforts going forward.



### IRT WORK

#### CFRTF YEAR ONE TIMELINE

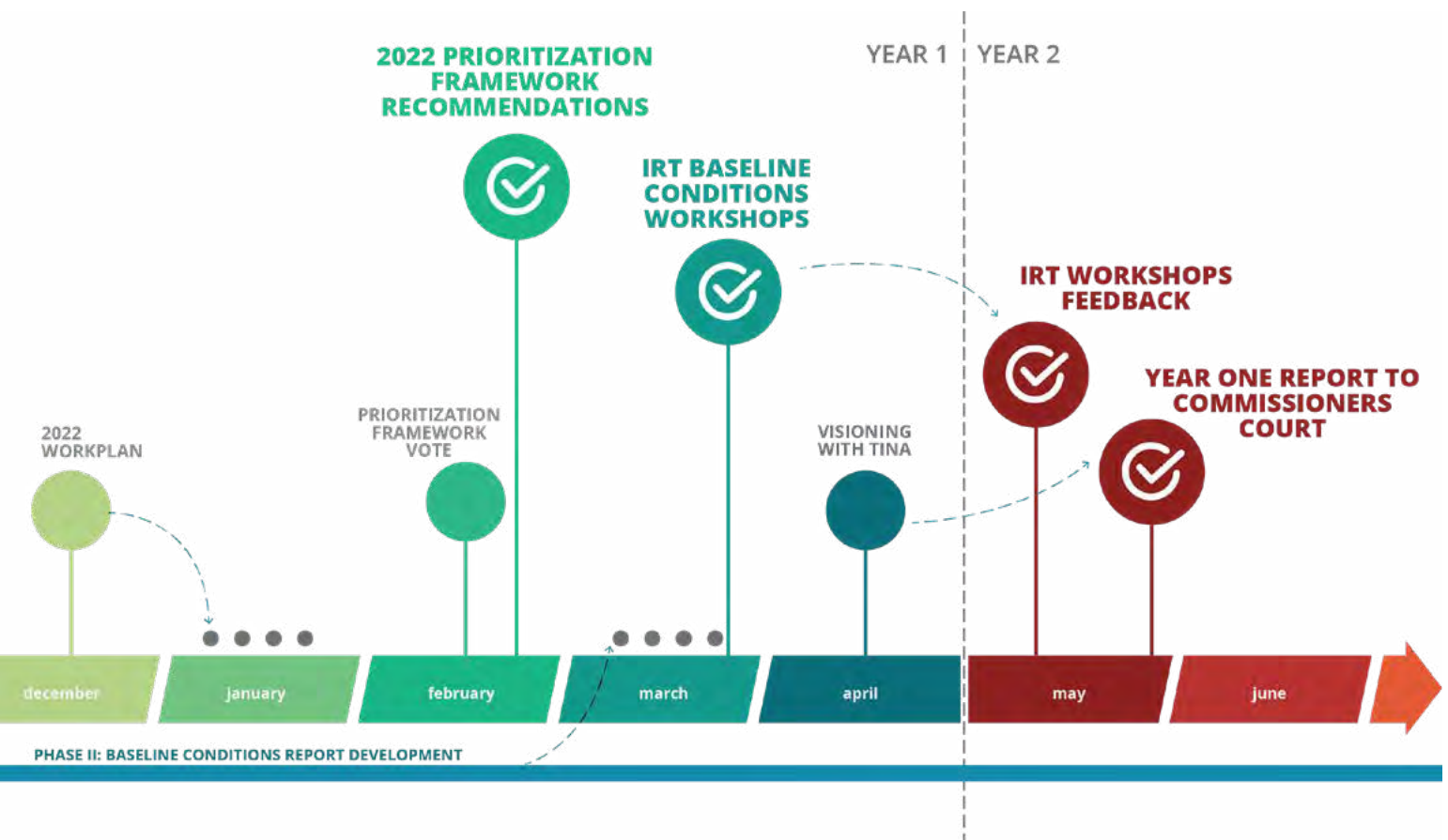
This graphic was prepared by the Facilitation Team to outline the Task Force's work for the 2021-2022 year. This shows Task Force meetings, key deliverables, and integration with IRT work. *See Appendix for full-size image.*



Through this work, the group has used the tools in its toolbox to deliver significant products to Harris County. These deliverables may all be found in the Appendix.

- ◇ **2022 Prioritization Framework Recommendations**—delivered to OCA and HCFCF a set of community-driven recommendations regarding proposed revisions to the framework and its use for the Flood Resilience Trust
- ◇ **Flood Mitigation Benefits Index (FMBI)**—proposed a new index designed to provide a better comparative understanding of past inequitable flood mitigation investments and current inundation risks
- ◇ **Infrastructure Resilience Team (IRT) Workshops**—collaborative sessions with the IRT on the content of the baseline conditions and Preliminary Flood Resilience Report, including Social Vulnerability, Flood Mitigation, Community Engagement, and Best Practice Approaches
- ◇ **Flood Resilience Repository**—comprehensive listing of previous plans, community engagements efforts, and innovative solutions to consider

This report is the culmination of the Task Force’s Year One work and sets a vision for the County’s overall resilience efforts.



# GOALS FOR THE 2050 FLOOD RESILIENCE PLAN

## What we're looking for

**The 2050 Flood Resilience Plan should set forth an approach to resilience that prioritizes people, addresses past inequities, and uses best flood mitigation practices—including natural infrastructure and nature-based solutions—to reduce annual flood risk for all Harris County communities to less than 1%.**

The 2050 Flood Resilience Plan should pave the way for Harris County to create a new framework for flood resilience planning. The Plan should be aspirational, forward-thinking, and innovative. It must deeply engage communities in its development and set up a framework for equitably planning, designing, and implementing projects. This goal of less than 1% is the current standard of care for new developments, and should be the goal for all communities.

In order for the plan to be successful and truly community-driven, it must create a new way of planning.

## INTEGRATED SOLUTIONS

The Task Force is looking to see integrated solutions that include nature-based designs, parks and open space, and connections to communities—like this example at Mason Park, Brays Bayou Watershed





## 1. Comprehensively assess the Baseline Conditions

The Baseline Conditions should identify current flood risks according to best practices and identify differences in prior flood mitigation investments across the County. Assessing current flood risk should include all measures of resilience, including flood risk, social vulnerability, health impacts, recovery, etc. *See IRT Workshop Feedback in the Appendix for detailed notes regarding the Baseline Conditions.*

**1.1** Create a “hotspot” map to set a new way of assessing a broader definition of “risk”. “Hotspots” are being defined as areas with low prior investment, high existing inundation risk, high social vulnerability, and low community resources (determined by access to critical resources such as food, community centers, different modes of transportation, and medical services)

**1.2** Describe Baseline Conditions using flood risk, Social Vulnerability Index (SVI), FMBI, and community resources

**1.3** Include consideration of the current Level of Service (LOS) for both channels and subdivision drainage. LOS refers to the carrying capacity of our drainage systems—a high LOS conveyance handles more flood waters and provides more flood risk reduction than a low LOS conveyance

**1.4** Ensure that baseline conditions evaluate the entire County using the same approach to ensure validity

**1.5** Groundtruth findings with communities to value qualitative data equally with quantitative data. Ensure that what communities have already shared is captured and not re-investigated

## 2. Create a new transparent and inclusive communications pattern to build trust with communities

Traditional community engagement is often conducted to meet a regulatory requirement and includes presenting a finished project concept to the public, asking for comments, and then responding to comments without making any significant project changes. In order to develop a truly community-driven plan that is well-positioned to succeed, a new system of engagement must be implemented.

**2.1** Establish multilingual bidirectional communication loops between the County, the CFRTF, and impacted communities that also considers how communities best process information (visual, aural, etc)

**2.2** Create avenues for community input and decision-making in planning and selecting projects

**2.3** Develop a robust communication plan alongside residents and utilize a range of engagement techniques to obtain input (e.g. existing neighborhood events, pop-ups at popular neighborhood establishments, door knocking with trusted community leaders, social media, faith based outreach, online surveys, QR codes, printed materials, hybrid listening sessions, etc)



### AUTHENTIC ENGAGEMENT

The CFRTF is looking to see more high quality engagement, like this work by the Northeast Action Collective.

### 3. Incorporate best practices and innovative approaches

The 2050 Flood Resilience Plan must incorporate and implement solutions that are forward-thinking, innovative, and global best practices. This involves both progressive technologies as well as proven techniques such as nature-based solutions and land preservation.

**3.1** Integrate nature-based solutions with cutting edge technical solutions into multiple lines of defense

**3.2** Preserve land in undeveloped areas by creating a strategy with nearby counties for land management, to lessen the impact of flooding and prevent future losses

**3.3** Retrofit older developed areas. This could include retrofitting drainage improvements, enhancing detention, enhancing conveyance, property buyouts, elevating structures, creating resilience hubs, addressing people who rent their homes, and/or enhancing adaptive capacity

**3.4** Build detention and conveyance in new developed areas, to provide water quality and groundwater recharge benefits

**3.5** Provide opportunities to protect existing floodplain and floodway areas by enabling flooded communities to relocate to more secure areas



#### FLOOD MITIGATION STRATEGIES

While an array of efforts are underway, current flood resilience efforts focus primarily on channel modifications and detention basins. The CFRTF is looking to see a broader range of solutions—especially nature-based and natural infrastructure solutions—beyond the traditional methods. *See Appendix for full-size image.*

## 4. Address inequities

There has been much discussion amongst the Task Force around understanding and documenting past inequitable investments in flood risk reduction across the County's communities. Harris County must take a proactive approach to identifying and addressing them within the 2050 Flood Resilience Plan.

**4.1** Use FMBI, along with other input variables, to create county-wide "hotspot" map

**4.2** Plan projects that address the largest and most significant "hotspots" first

**4.3** Implement projects equitably

**4.4** Collect countywide data on project implementation in order to assess and continually improve the County's equitable flood resilience efforts

## 5. Harmonize regulations across County and municipal boundaries

Harris County Flood Control should work with Floodplain Administrators and adjacent municipalities to establish a structure that clearly defines flood resilience responsibilities, consistently regulates new development, and guides the design of flood risk reduction and drainage projects. Harris County should have a plan to ensure cooperation among diverse entities investing in flood infrastructure – cities, Municipal Utility Districts (MUD)s, the County, and the state.

**5.1** Clearly define the roles and responsibilities for flood resilience and drainage issues (e.g. HCFCD, Harris County precincts, and the City of Houston)

**5.2** Identify and address gaps in regulation with surrounding counties

**5.3** Enforce strict floodplain management rules in both new and older developed areas

**5.4** Identify and recommend appropriate development regulations the County can implement

**5.5** Work with other governing entities and the Texas Water Development Board in its 2050 State Flood Plan to harmonize regulations and rules across jurisdictional boundaries

## 6. Increase transparency around the Flood Bond to ensure communities really understand how the bond is providing value

A major hurdle in continued flood resilience efforts is that communities don't know what projects are happening in their neighborhoods and who is benefitting. If that continues, communities will be less likely to support a future bond. Harris County needs to enhance communications to convey that this bond was the right step to take and a future bond would be the next right step to take.

*In order to have a successful future next step, Harris County must make sure the benefits of all 2018 Flood Bond projects are clearly illustrated to the community.*

**6.1** Improve perception of value with current bond

**6.2** Publicize completed projects and level-of-service improvements.

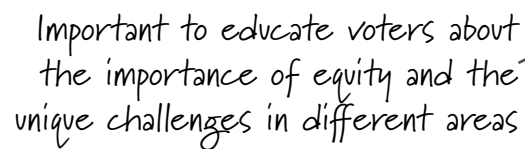
**6.3** Provide information to various media and social platforms as well as to community groups to highlight the impact and effect of these completed projects as well as identifying what needs to be accomplished next, if appropriate.

*See Task Force Next Steps for how the Task Force can help Harris County liaise with communities around this topic.*

## 7. Identify ways to fund all critical projects

Solving flooding issues in our communities will require significant financial resources. Harris County should utilize and pursue all sources of available funding to prioritize budget for flood resilience projects. The projects outlined in the 2050 Flood Resilience Plan should work to secure funding to reach the overall goal in all impacted communities.

*Important to educate voters about the importance of equity and the unique challenges in different areas*



**7.1** Work with HCFCD, Engineering, and the IRT to estimate the cost of reducing flood risks for everyone in the County to 1% annual chance (i.e. 100-year flood) or less

**7.2** Estimate the available Harris County bonding capacity, given current fiscal conditions and economic conditions

**7.3** Secure and utilize the \$750 million CDBG-MIT funding as soon as possible to progress flood resilience goals, and involve the community in allocating funding

**7.4** Utilize available Flood Resilience Trust funds to implement projects beyond the 2018 Flood Bond

**7.5** Reallocate funding within the Harris County budget to prioritize flood mitigation projects

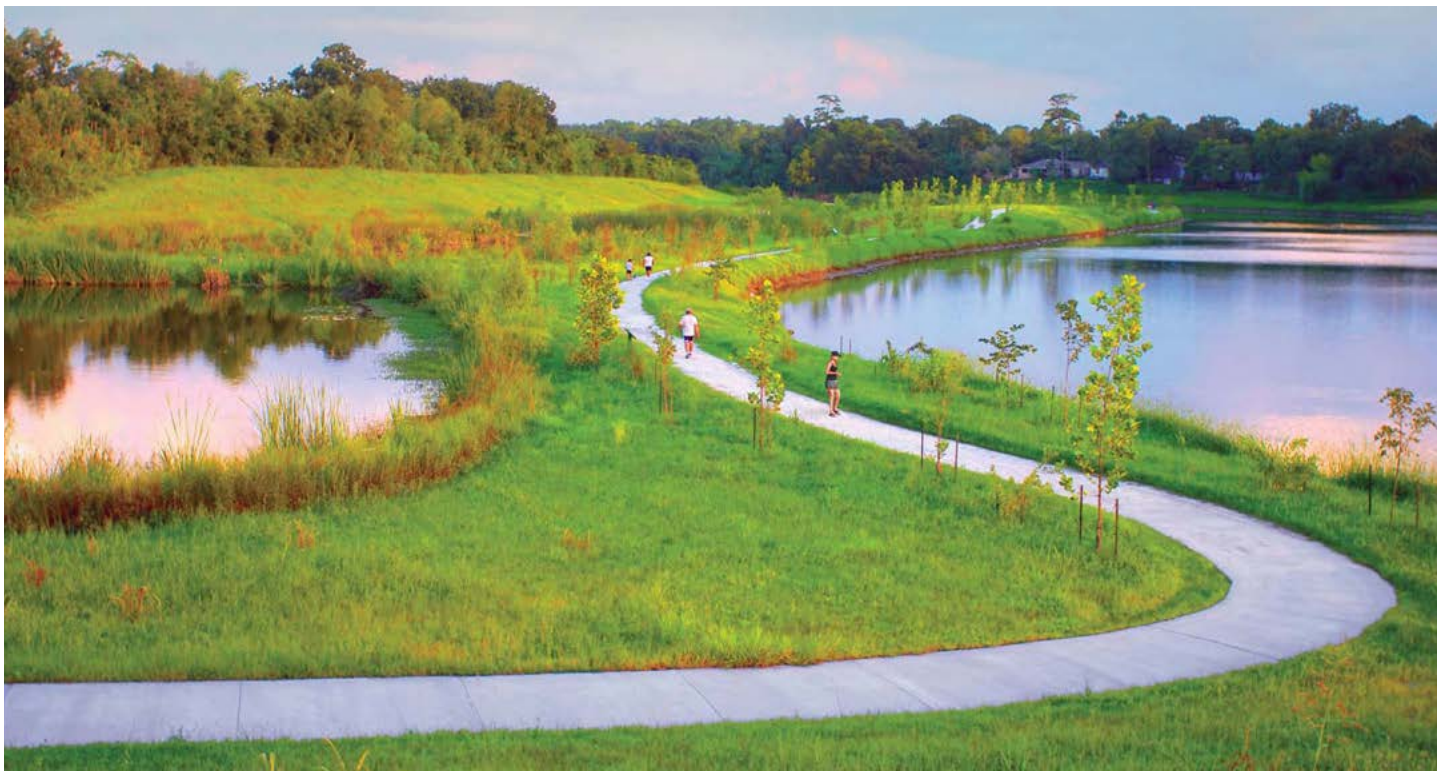
**7.6** Determine how projects interrelate and/or depend on the completion of other projects to ensure the most effective use of these funds

**7.7** Identify funding and implementation strategies for integrated nature-based solutions

**7.8** Tactically seek federal funding and grants so that local flood risk reduction goals that may not meet federal benefit cost ratio requirements are not sacrificed.

**7.9** Tactically seek other partnership funding to leverage County flood funds





## INTEGRATED NATURE-BASED SOLUTIONS

The Task Force is looking for investments that integrate nature-based solutions with traditional engineering infrastructure, like this tidal stormwater enhancement wetlands at Mason Park, Brays Bayou



Photo: Elaine Morales-Díaz

Photo: Elaine Morales-Díaz

## COMMUNITY EDUCATION + INVESTMENT

The CFRTF believes that Harris County communities should be deeply involved in flood resilience efforts in their neighborhood. Each area should be aware of on-going projects and have a voice in future work.



# TASK FORCE NEXT STEPS

## What we're doing to support County efforts

Our goal is to provide **community voices** into Harris County's resilience efforts. We recognize that these efforts require much time and intention, and we aim to create a bridge between County IRT departments and Harris County communities. We are accordingly prioritizing the following deliverables for the coming year:



Photo: Elaine Morales-Díaz

### TASK FORCE WORK

The Task Force is committed to providing more integrated community voices into these efforts and will continue collaborating with the County and communities over the coming year to accomplish their work.

**1. Advise Harris County on the Preliminary Flood Resilience Report and 2050 Flood Resilience Report**

**Full Task Force**

- ◇ Provide feedback on baseline conditions and “hotspot” analysis
- ◇ Recommend a series of best practices and approaches for consideration
- ◇ Ensure that the preservation and protection of natural infrastructure and the integration of nature-based solutions are incorporated into the plan.
- ◇ Advise on the community engagement strategy, based on best practices, understanding of key stakeholders, and effective outreach methods
- ◇ Identify ways to ensure that information already provided by local communities is incorporated into the plan, including the provision of experts to translate community desires and recommendations into projects
- ◇ Provide facilitation support to county staff at workshops and events to help community members provide helpful feedback on presented topics

**2. Continue to provide input to the Harris County Community Services Department (HCCSD) on the \$750M CDBG-MIT Method of Distribution (MOD)**

**Overall Approach and Finance + Regulatory Committees**

- ◇ Participate in HCCSD’s MOD Process
- ◇ Advocate for the MOD to prioritize flood resilience projects

**3. Collaborate with HCFCD and the IRT to obtain data and calculate the FMBI**

**Equity + Metrics Committee**

**4. Liaise with communities to build capacity to influence flood resilience efforts**

**Community Engagement Committee**

- ◇ Develop CFRTF Roadshow and easy-to-read materials for sharing at community meetings
- ◇ Develop a set of FAQs to respond to community questions
- ◇ Host a watershed tour in impacted communities to increase knowledge of areas and sources of flooding



# CONCLUSION

At the completion of its first year, the Community Flood Resilience Task Force is now an established and well-regarded resource for the County in its ongoing efforts to make Harris County a flood-resilient community. We hope that Commissioners Court continues to value and equip the Task Force to provide the essential community voice into these efforts.

The Task Force stands ready to provide what only they can—community-based subject matter expertise and lived experience that is critical to Harris County creating a comprehensive, innovative, and community-driven plan for resilience for 2050 and into the future.

**We hope that these efforts usher in a new way of thinking about flood prevention, mitigation, resilience, and equity for all Harris County communities.**









## Report Glossary

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### Abbreviations

**CDBG-MIT**—Community Development Block Grant Mitigation

**CFRTF**—Harris County Community Flood Resilience Task Force

**FMBI**—Flood Mitigation Benefits Index

**HCFCDD**—Harris County Flood Control District

**IRT**—Harris County Infrastructure Resilience Team

**OCA**—Harris County Office of County Administration

**LOS**—Level of Services, refers to the carrying capacity of our systems

**MAAPNext** —Modeling, Assessment, and Awareness Project

**MOD**—Method of Distribution, likely in reference to CDBG-MIT funds

**SVI**—Social Vulnerability Index

### Terms

**100-year flood**—1% annual chance of flooding

**Hotspots**—areas with low prior investment, high existing inundation risk, high social vulnerability, and low community resources

**Flood Mitigation**—efforts to reduce loss of life and property by lessening the impact of flood disasters [NH.gov]

**Nature-Based Solutions**—sustainable planning, design, and engineering practices that weave natural features or processes into the built environment to promote adaptation and resilience [FEMA]



## Special Thanks to the Following Contributors

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### Facilitation Team

**Leah Chambers**, Interim CFRTF Facilitator

**Sarah Berberich**, Interim CFRTF Support

### Harris County Flood Control District

**Dr. Tina Petersen**, Executive Director, Harris County Flood Control District (HCFCD)

**Alan Black**, Deputy Director of Engineering and Construction, HCFCD

**Vanessa Toro Barragán**, Flood Resilience Senior Planner, HCFCD

### Office of Budget Management

**Peter Key**, Senior Director, past advisor

**William McGuinness**, Manager of Capital Projects & Infrastructure

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**Karly Stelzer**, HCED

**Stephan Gage**, Harris County Toll Road Authority (HCTRA)

**Carolyn White**, Harris County Public Health (HCPH)

**Kevin Garza**, Harris County Community Services Department (HCCSD)

**Lizeth Hernandez**, Harris County Office of Homeland Security and Emergency Management (HCOHSEM)

**Matt Lopez**, HCFCD

### IRT Department Directors

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**Roberto Treviño**, HCTRA

**Barbie Robinson**, HCPH

**Dr. Adrienne Holloway**, HCCSD

**Mark Sloan**, HCOHSEM

### Support

**Raynese Edwards**, OutsideIn Consulting

### Image Credits

**Leah Chambers**, Facilitation Team

**Elaine Morales-Díaz**, CFRTF

**Harris County Flood Control District**

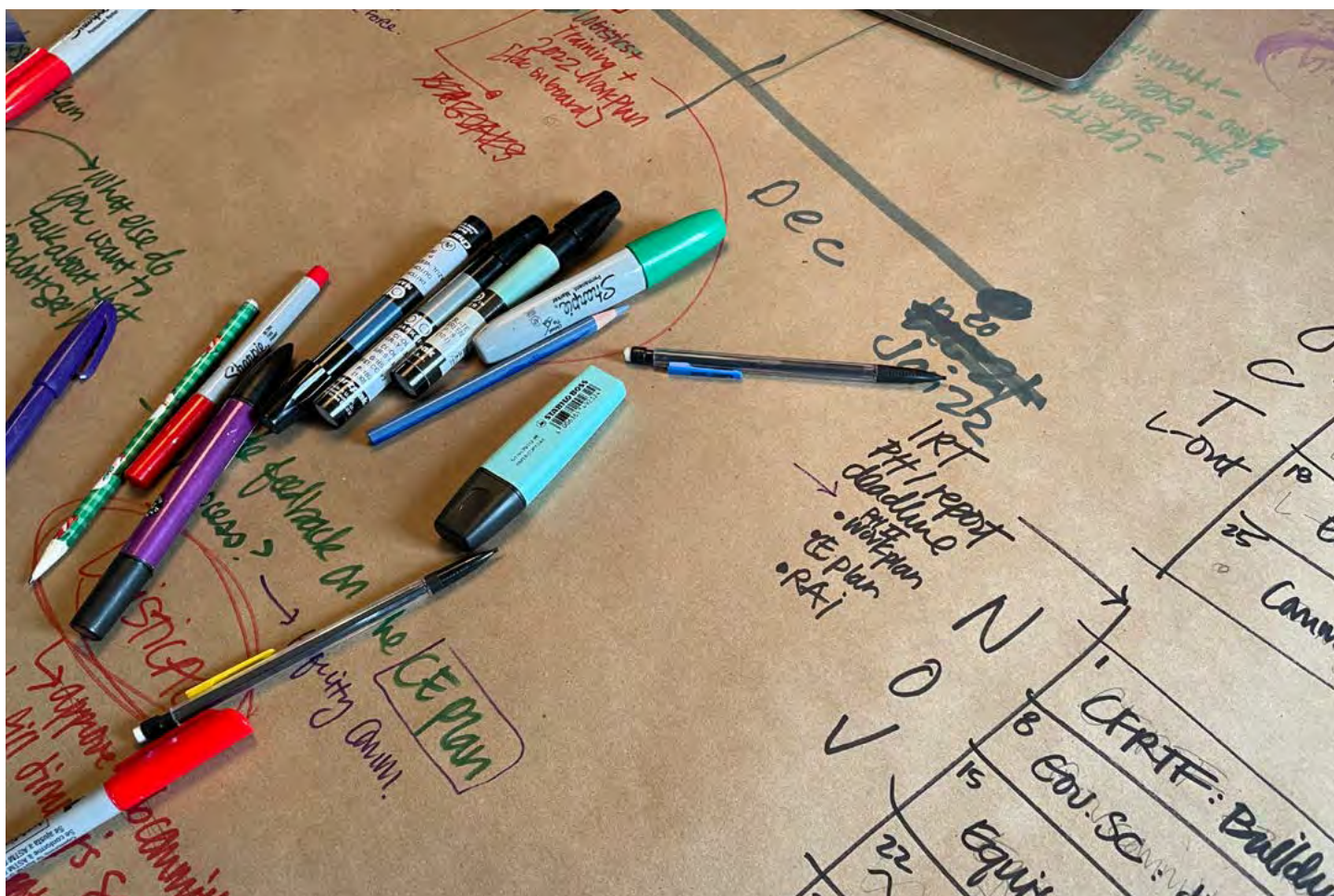
**Northeast Action Collective**

**Raynese Edwards**, OutsideIn Consulting





## APPENDIX





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	Harris County Flood Resilience Landscape
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	Flood Mitigation Strategies

## EXECUTIVE COMMITTEE



### **KENNETH WILLIAMS | Chair**

Kenneth Williams is a founding director of the Northeast Houston Redevelopment Council, Vice-President of Super Neighborhood 48 Trinity-Houston Gardens, and a community servant/activist/resident.



### **ELAINE MORALES-DÍAZ | Vice Chair**

Elaine Morales-Díaz is the Director of Partnerships and Policy at Connective where she leads collective initiatives and local policy recommendations focused on community resilience, recovery, and the continuous improvement of social services. With a background in Architecture and Community Planning, Elaine has worked on equity building initiatives that support access to affordable housing, advance just disaster recovery practices, and address community development issues through participatory design and planning.



### **YASMEEN DÁVILA | Secretary**

Yasmeen Dávila is a multi-disciplinary non-binary queer artist and organizer in Houston, Texas. Having lived through various hurricanes that passed through Houston, they have set their pursuits to advocate for the neglected neighborhoods that experience floods and chemical exposures before, during, and after hurricane season.



# APPOINTED MEMBERS



## **SHIRLEY RONQUILLO | County Judge's Office**

Shirley Ronquillo is a Harris County community organizer, East Aldine resident and co-founder of the Houston Department of Transformation. After Hurricane Harvey, Shirley recognized the need to work with residents to advocate for equitable flood mitigation and encourages residents to raise their voices.



## **MASHAL AWAIS | Precinct 1**

Mashal Awais is the watershed specialist at Bayou City Waterkeeper, where her work focuses on the pursuit of healthy waters, ecosystems and communities throughout the Lower Galveston Bay Watershed. She holds a Master's in Environmental Analysis from Rice University and has over 8 years experience working alongside environmental justice and frontline communities.



## **LISA GONZALEZ | Precinct 2**

Lisa Gonzalez is the Vice President & Executive Director of Audubon Texas, leading statewide strategy for a dedicated team of conservation, policy and educational professionals working to protect birds and the places they need. Lisa is a longtime resident of East Harris County and as a coastal scientist, focuses on climate resilience and intersections between natural ecosystems and the built environment.



## **BOB REHAK | Precinct 3**

Bob Rehak has more than 50 years of experience in communications. After seeing thousands in his area flooded during Harvey, he launched ReduceFlooding.com, a website dedicated to helping people understand the causes of flooding as well as mitigation possibilities.



## **BILL CALLEGARI | Precinct 4**

Bill Callegari is a long-time citizen of Harris County, including 40 years residence on the Katy Prairie. He is a licensed professional engineer, and also served as the Texas State Representative representing Katy and Cypress for fourteen years, from 2001 to 2015.



## **JOHANA CLARK | City of Houston**

Johana Clark is the Senior Assistant Director managing Stormwater Operations with Houston Public Works which oversees the daily operations of the City's critical drainage system infrastructure. Johana has a bachelor's degree in Civil Engineering from the National University of Colombia and a Master of Engineering from the University of Texas at Arlington.

# AT-LARGE MEMBERS



## **ADRIANA TAMEZ**

Adriana Tamez is a Houston Community College Trustee, and President and CEO for the Tejano Center for Community Concerns (TCCC) providing overall management of the non-profit organization and its nine service programs. Essential to this work has been nurturing and creating partnerships at all levels to meet the needs of our most vulnerable populations in our county.



## **DR. DENAE KING**

Dr. Denae King is a native Houstonian and an environmental justice researcher at Texas Southern University. She earned a Ph.D. in environmental science/toxicology from the University of Texas Health Science Center - Houston, School of Public Health and works on environmental health projects in Houston's underserved communities.



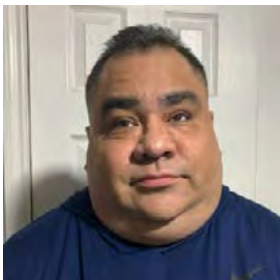
## **DR. JOSEPH COLACO**

Dr. Joseph Colaco holds a Ph.D. in Engineering from the University of Illinois, Urbana-Champaign and is President of Colaco Engineers and Professor of Architecture at the University of Houston. Dr. Colaco brings over 50 years of engineering experience related to flood resilience and mitigation and was a founding member of the Hurricane Research Center at Texas A&M.



## **MARY ANNE PIACENTINI**

Mary Anne Piacentini, President and CEO, Coastal Prairie Conservancy, coordinates its land protection programs and conservation assistance to landowners, establishes community partnerships and relationships with stakeholders, and oversees the operations and programs of the agency. She has a master's degree in planning from Harvard University and is currently a board member of the Partnership for Gulf Coast Land Conservation.



## **BILLY GUEVARA**

Billy Guevara is a member of the Northeast Action Collective, a community organizer, and twice-over flood survivor. He is totally blind and represents the interests of the neighborhoods in Northeast Houston.



## **DR. PAMELA HERNANDEZ**

Pamela Hernandez, Ph.D. is principal researcher and founder of Educo Research, a research firm that builds human capacity and social change through research. She has fifteen years of experience in higher education institutions, and working with various agencies across the U.S. in fields such as educational research, assessment and evaluation, as well as leadership development, multiculturalism, diversity, and social justice training.



### **MICHAEL BLOOM**

Michael F. Bloom, P.E., ENV SP, CFM, directs the sustainability practice of R. G. Miller Engineers, Inc. and is Vice President - Technical of the Houston Branch of the American Society of Civil Engineers. He is a nationally recognized expert in resilient and sustainable infrastructure planning and design with 29 years of professional experience.



### **TRACY STEPHENS**

Tracy Stephens is the President of Sunnyside Civic Club, Gulfgate TIRZ Board Vice Chairman, Infrastructure Rehab and Development Chairman for South Park Community, ACTS Board Research Coordinator, and worked for the City of Houston Public Works and Engineering Specialized Maintenance District Supervisor for Streets, Drainage Construction and Rehab.

## **PREVIOUS CONTRIBUTORS**



### **DR. EARTHEA NANCE**

Dr. Earthea Nance was appointed by the Biden Administration as the EPA Region 6 Regional Administrator. Earthea is an environmental engineer who has, for two decades, worked with communities at disproportionate risk of environmental hazards. As a professor and graduate student, she conducted community-based research after Hurricane Katrina, during the Deepwater Horizon Oil Spill, and in communities without safe water and sanitation in Brazil and Mozambique.



### **IRIS GONZALEZ**

Iris Gonzalez is the Chief of Staff for Dr. Earthea Nance, the EPA Region 6 Regional Administrator. She was previously the founding Coalition Director for The Coalition for Environment, Equity and Resilience (CEER), an advocacy collaborative working on environmental justice policy solutions in the greater Houston region. She has over 10 years experience in program development, program management, coalition building, grant-making, fundraising, and community engagement.



### **LAURA PATIÑO**

Laura Patiño is the Chief Resiliency Officer for the City of Austin. Prior to joining the city of Austin, Laura served as the Deputy Resiliency Officer for the City of Houston and helped to develop and implement the Resilient Houston strategy and the Climate Action Plan while tying in Harvey Recovery efforts city-wide.



# 2022 PRIORITIZATION FRAMEWORK LETTER

In December 14, 2021, Harris County Commissioners Court requested that the Community Flood Resilience Task Force review and provide recommendations to the County on the proposed revisions to the Prioritization Framework.

This letter was prepared in response, directed to the County Administrator, David Berry, and the Interim Executive Director of Harris County Flood Control District, Alan Black. It includes the key priorities of the Task Force for the framework as well as specific recommendations for next steps.

**The new 2022 Prioritization Framework was transmitted to court on April 26, 2022 and incorporated the Task Force's feedback on the key issues.**



Community Flood Resilience Task Force  
9900 Northwest Fwy, Houston, TX 77092  
[CFRTF@hcfcd.hctx.net](mailto:CFRTF@hcfcd.hctx.net) | [CFRTF.harriscountytx.gov](http://CFRTF.harriscountytx.gov)

February 17, 2022

**David Berry**, County Administrator  
Office of the County Administrator  
1001 Preston St. Suite #500, Houston, TX 77002  
[David.Berry@bmd.hctx.net](mailto:David.Berry@bmd.hctx.net)

**Alan Black**, Interim Executive Director  
Harris County Flood Control District  
9900 Northwest Fwy, Houston, TX 77092  
[Alan.Black@hcfcd.hctx.net](mailto:Alan.Black@hcfcd.hctx.net)

County Administrator David Berry and Interim Executive Director Alan Black,

The Community Flood Resilience Task Force (CFRTF) is pleased to provide you with our recommendations regarding the proposed revisions to the Prioritization Framework, as requested by Harris County Commissioners Court on December 14, 2021. We applaud the move of Commissioners Court to ensure the involvement of community voices and subject matter experts in service of the County's equitable flood resilience efforts.

In response to the request, the CFRTF created an Ad Hoc Committee to evaluate the proposed revisions with representatives of the Harris County Flood Control District (HCFCD), Office of the County Administrator (OCA) and the Infrastructure Resilience Team (IRT), which met on January 19 and February 2, 2022. The Ad Hoc Committee then presented their recommendations to the full CFRTF for a vote at a Special Meeting on February 8, 2022. All recommendations below were unanimously approved by CFRTF members, unless otherwise noted. The meetings were open to the public and integrated community feedback through verbal comments, in-meeting chat, and written comments submitted via email. A summary of these comments is provided in the appendix to this letter.

All of the following CFRTF recommendations are predicated on the following key priorities:

- Center people over buildings to describe the benefits of flood resilience projects
- Focus on County-specific priorities to allocate locally-controlled funding
- Promote overall resilience by implementing projects that reduce immediate flood risk for people while also implementing nature-based solutions that keep flooding from getting worse

- Ensure the metrics we're using advance equity, rely on best practices, and are as accurate as possible at this point in time

## **1. RECOMMEND USING PEOPLE TO MEASURE PEOPLE BENEFITED**

The proposed Benefits Efficiency formula attempts to place greater emphasis on the number of people benefitted by a flood mitigation project. However, using the number of structures removed from the 1% event as a proxy for the number of people benefitted misses an opportunity to truly center the benefits of flood mitigation projects to people. As currently proposed, the Benefits Efficiency captures the cost effectiveness of a project to the County as dollar per structure, rather than capturing the benefits accrued to people. To shift this focus we recommend:

- Implement a formula to measure the number of people benefitted by a project. The CFRTF considered two methods that calculate people, including (i) utilizing census data for an area-weighted approach which would estimate benefits to all people within the project area regardless of multiple floors and (ii) utilizing HCAD data for a parcel-based approach which could differentiate between direct flood reduction benefits to the people on the first floor and partial benefits to people on upper floors. The CFRTF does not recommend one approach over another and instead provides the following guidance for HCFCD and the OCA.
- The formula should:
  - i. Be as simple as possible, with the fewest number of assumptions.
  - ii. Use the most recent and finest grain data possible to capture the number of people most accurately.
  - iii. Capture benefits for all people in the project area, including people on the first and upper floors.
- Lastly, the CFRTF feels that the proposed Benefits Efficiency metric focuses more on measuring cost efficiency rather than benefits, and we recommend that this formula keep its former name, "Project Efficiency."

## **2. RECOMMEND REMOVING COMMITTED PARTNERSHIP FUNDING FROM THE BENEFITS EFFICIENCY FORMULA.**

The proposed Benefits Efficiency formula calculates the total cost to the County, subtracting the committed partnership funding from the total project cost. While we understand the intent of this calculation is to determine the reach of the County dollar, the Task Force believes the metric should focus on the project's overall cost efficiency, calculated only by the project's total cost per person benefitted, without factoring in partnership funding. To further support this recommendation, we note that utilizing committed partnership funds disadvantages projects that aren't able to successfully attain other forms of local, state, or federal funding and that the County should pursue projects that meet local needs rather than be restricted by partnership fund requirements.



There were two dissenting votes for this recommendation due to concerns that removing partnership funding from the equation could disincentivize the County from pursuing money from external sources. Therefore, while we recommend not including committed partnership funding in the formula, we are not recommending excluding external funds from project evaluation altogether. Instead, we encourage the County to continue to pursue as much partnership funding as possible until all projects are completed.

### **3. RECOMMEND ADJUSTMENTS TO THE ASSIGNED VALUES FOR PROJECTS WITHOUT DIRECT BENEFITS TO STRUCTURES IN THE BENEFITS EFFICIENCY METRIC**

The 2018 Flood Bond included projects that move the County forward in overall resilience. These include projects with direct benefits to structures, as they reduce the flood risk of a structure in the floodplain, as well as projects that implement nature-based solutions, such as floodplain preservation. Projects such as floodplain preservation do not directly reduce flood risk to current structures but, in the long-term, typically prevent development that could result in flood risk to structures. The 2018 Flood Bond also includes projects such as stabilization and restoration of channels that further the District's operation and maintenance of infrastructure but that do not directly reduce flood risk to structures. In order to balance reducing flood risk for people with furthering resilience more broadly, we recommend that the framework prioritize projects that go beyond operations and maintenance and score the projects as follows:

- Lower the Benefit Efficiency scores for projects that fall under Wetland Mitigation Banks to a 1.
  - Wetland mitigation banks should be considered part of the District's operations and maintenance as these involve meeting the federal regulatory requirements of projects.
- Distinguish between types of Stabilization projects to add a Natural Channel Design classification, to be scored at a 6.
  - Standard stabilization projects fall under typical operations and maintenance of the District and should be scored low, but natural channel design is a nature-based solution that is prioritized in the Harris Thrives resolution and should be scored high.
- Keep the following scores as they are.
  - Stabilization projects that are maintenance-related scored at a 1.
  - Investigation projects scored at a 2.
  - Floodplain Preservation projects scored at a 7.

For future projects outside of the current 2018 bond program, the CFRTF recommends building operations and maintenance costs into the HCFCD budget, rather than listing them as separate projects to be ranked. However, the County should ensure adequate funding for the District so as to not create an operations and maintenance budget deficiency. The County should also work to clarify their goals regarding targets for direct flood risk reduction and nature-based solutions projects, and should consider that part of

the critical visioning process for the Flood Resilience Plan that builds upon the Harris Thrives resolution.

#### **4. RECOMMEND A MORE RECENT RANGE OF DATA FOR THE LEVEL OF SERVICE PROXY**

The proposed addition of the level of service proxy as a blended data set of FEMA claims since 1977 and windshield damage assessments after a declared disaster to measure the extent and frequency of flood damage is a step in the right direction to create an apples-to-apples comparison between channel and detention projects and subdivision drainage projects. While there is concern with utilizing the FEMA data, given the history of federal policies that unfairly burden, exclude, and therefore undercount the impact of disasters in low-income and minority populations, the addition of windshield damage assessments can supplement this data set and help correct for undercounted populations during a disaster. To a lesser extent, windshield damage assessments also underestimate the extent of damaged homes during an event, but the CFRTF recognizes that this blended data set is the best available data at this time.

Regarding the timeframe, using data from 1977 would not be a good proxy since much of Harris County was not developed at that time and windshield damage assessments were not being conducted at the time. Therefore, going back this far would not offer an accurate nor equitable picture. In order to ensure a more accurate proxy for frequency of flooding, we recommend:

- Use a more recent range of data, where both the FEMA claims and the County-wide windshield damage assessments are as accurate as possible.
- Change the term “level of service” to another phrase such as “frequency of flooding” that more accurately captures the intent of the proxy metric.

These recommendations focus on the use of the Prioritization Framework to rank the 2018 Flood Bond Projects for allocation of Flood Resilience Trust funds. We look forward to collaborating further with the OCA and HCFCD as they work to practically implement the recommendations posed here. Please reach out with any questions or points of clarification needed.

Going forward we need to develop a suite of tools, in addition to the Prioritization Framework, that Harris County can continue to evolve over time to conceive of and effectively evaluate projects for efficiency, equity, and impact. We recommend that HCFCD and the OCA begin working with the Task Force and the Infrastructure Resilience Team (IRT) within the next six (6) months on shaping future tools, one of which could be the Flood Mitigation Benefits Index (FMBI) that is currently in development between the Task Force and HCFCD. This work should also include developing a methodology for on-going re-scoring of projects as they move across the phases of the project life cycle and an evaluation of the efficacy of these tools in meeting the County’s resilience goals. Additionally, as the Commissioners Court is aware, it is estimated that our community will require upwards of \$60 billion to adequately mitigate flooding in Harris

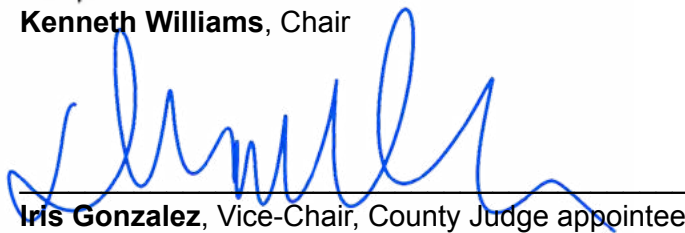
County. The challenge is massive and the County should start working now to identify funding sources that fully implement the coming 2050 Flood Resilience Plan.

Thank you for your leadership and commitment to equitable flood resilience in Harris County. We are honored to represent our communities and play an important role in these efforts and encourage County Judge Hidalgo and the Commissioners to continue to leverage our lived experience and subject matter expertise to move Harris County forward together.

Thank you,



**Kenneth Williams**, Chair



**Iris Gonzalez**, Vice-Chair, County Judge appointee



**Yasmeen Dávila**, Secretary

On behalf of the  
**Community Flood Resilience Task Force Members**

Mashal Awais, Precinct 1 appointee  
Lisa Gonzalez, Precinct 2 appointee  
Bill Callegari, Precinct 3 appointee  
Bob Rehak, Precinct 4 appointee  
Adriana Tamez  
Tracy Stephens  
Mary Anne Piacentini  
Elaine Morales-Díaz  
Dr. Denae King  
Joseph Colaco  
Billy Guevara  
Michael Bloom  
Laura Patiño, City of Houston representative

*Attachment: Summary of Public Comments on the Prioritization Framework Proposed Revisions*





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February 17, 2022

## **SUMMARY OF PUBLIC COMMENTS on the PRIORITIZATION FRAMEWORK PROPOSED REVISIONS**

received by the Community Flood Resilience Task Force | verbal and written

Overall, members of the public were firm in that this Prioritization Framework should not be used to reallocate funding from one intended area to another. They underscored the need for a comprehensive plan for flood resilience and the need for a suite of tools to address how new projects are conceived, designed, prioritized, and implemented equitably. Topic-specific comments are as follow:

### **1. ON USING STRUCTURES OR PEOPLE TO MEASURE PEOPLE BENEFITED**

The members of the public overwhelmingly supported counting people instead of structures. They were interested in using census or HCAD data sources to derive the number of people affected, and there was support for capturing benefits to everyone in the structure, not just the first floor.

### **2. ON INCLUDING OR NOT INCLUDING COMMITTED PARTNERSHIP FUNDING IN THE BENEFITS EFFICIENCY FORMULA.**

The community leaned towards not including committed partnership funding in the formula, in support of prioritizing locally-controlled funds. There was a suggestion made to potentially only consider partner funding as a factor in a go/no-go project scenario. Additionally, several members of the public requested regular re-evaluation of the framework to assess whether it was performing as intended.

### **3. ON THE ASSIGNED VALUES FOR PROJECTS WITHOUT DIRECT BENEFITS TO STRUCTURES IN THE BENEFITS EFFICIENCY METRIC**

The public felt that preservation projects should be competitive with projects that reduced flood risk for structures/people and should be scored high. Wetland Mitigation Banks and other maintenance projects should be removed altogether, or scored low. There was also support for Natural Channel Design to be used only on channels that were previously engineered, rather than on currently natural channels.

### **4. ON THE PROPOSED DATA SET FOR THE LEVEL OF SERVICE PROXY**

The public was concerned about the FEMA data, and felt that it could be problematic in terms of discriminatory practices that advantaged wealthier and whiter communities over immigrant, undocumented, or low-to-moderate-income (LMI) communities and communities of color.

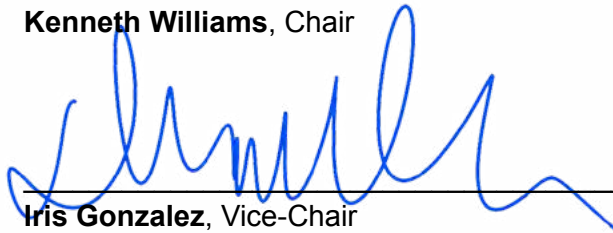
We, the Executive Committee of the CFRTF, note with concern that a portion of the public comments the Task Force received throughout this process included language that indicated animus against persons or communities of color, including examples of coded language. It is critical both legally and morally for government bodies and officials to act and make decisions in a way that does not discriminate, regardless of public support for a policy that has a discriminatory effect.

Thank you,



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**Kenneth Williams**, Chair



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**Iris Gonzalez**, Vice-Chair



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**Yasmeen Dávila**, Secretary

# FLOOD MITIGATION BENEFITS INDEX (FMBI)

As their first key action, the CFRTF Equity + Metrics Committee worked to create a new index in order to better understand historical inequitable mitigation investments and current inundation risks. This proposal, put forth in July 2021, outlines the goals and initial proposed structure of the index.

**The Infrastructure Resilience Team, along with the Harris County Flood Control District and the City of Houston, are currently collaborating with the CFRTF on collecting data and further developing the index, for possible use in the baseline conditions analysis of the 2050 Flood Resilience Plan.**





**Date:** July 7, 2021

**To:** Harris County Infrastructure Resilience Team (IRT) (via P. Lorente)  
Harris County Flood Control District (via M. Zeve)  
City of Houston (via L. Patiño)

**From:** Harris County Community Flood Resilience Task Force (CFRTF)

**Subject:** Clarification of Request for Flood Benefits Index Data and Calculation Results

The purpose of this memorandum is to clarify the CFRTF's request for data to support the calculation of the CFRTF proposed Flood Benefits Index (FBI) for both the Harris County Flood Control District (HCFCD) flood protection systems and for City of Houston drainage systems. This memorandum also formally requests that the HCFCD and the City of Houston meet with the Chair and Vice Chair of the CFRTF Equity and Metrics Committee (Michael Bloom and Dr. Earthea Nance) at least once to review the information in this memorandum and to discuss this data request. This was previously referred to as the Benefits Index.

The Flood Benefits Index<sup>1</sup> is calculated as follows:

$$\text{Flood Benefits Index} = \frac{\text{Total Cost to Date}}{\text{Population Density} \times \text{Flood Risk}}$$

Where:

- **Flood Benefits Index (FBI)** is an index that allows for objective spatial comparison of flood equity. The index should be considered unitless in practice and should be used in a comparative manner similar to the use of the Gini Coefficient<sup>2</sup> or the Social Vulnerability Index.<sup>3</sup>
- **Total Cost to Date** is the cumulative dollars spent on flood risk reduction projects (construction only, adjusted for inflation) over the longest time period for which records are available. Calculated at the U. S. Census Tract level.
- **Population Density** is the number of people per square mile. Calculated at the U. S. Census Tract level.
- **Flood Risk** is the current annual chance that residences will be inundated, expressed as a number equal to the percent annual chance of inundation; ie. 0.5% = 0.5; 1% = 1; or 10% = 10; etc. Calculated at the U. S. Census Tract level.

<sup>1</sup> The Flood Benefits Index was developed by Dr. Earthea Nance and Iris Gonzalez ("Apples to Apples," CEER Policy Brief, May 17, 2021, [ceerhouston.org](https://ceerhouston.org)), and was presented to CFRTF, HCFCD, and IRT on June 2021.

<sup>2</sup> <https://www.census.gov/topics/income-poverty/income-inequality/about/metrics/gini-index.html>

<sup>3</sup> <https://www.atsdr.cdc.gov/placeandhealth/svi/index.html>

A high Flood Benefits Index (FBI) means that the people living in the corresponding Census Tract have received a higher level of prior investment and are currently exposed to a lower flood risk. A low FBI means that people living in the corresponding Census Tract have received a lower level of prior investment and are currently exposed to a higher flood risk.

## **Intent**

The intent of this request is to better understand the history and outcome of flood risk reduction investments in our region, and to develop an unbiased comparison of cumulative flood benefits. The CFRTF believes that this investment history and resulting and current likelihood of flooding is one important consideration in our work to “evaluate and provide feedback on future flood resilience projects to help ensure they are locally contextualized, take an innovative and equitable approach to strengthening flood resilience, and are aligned with Harris County’s flood resilience planning efforts and overall framework for strengthening flood resilience.”<sup>4</sup>

The following sections provide additional details regarding this request, including more detailed information about each input variable, scale considerations, and suggested analysis methods. All data requests include Harris County and City of Houston.

The CFRTF recognizes that this request omits consideration of flood risk project construction costs undertaken by municipal utility districts, Harris County precincts, and cities other than the City of Houston. This omission could lead to slightly lower calculated FBI values in Census Tracts located inside these jurisdictions. The CFRTF will note this fact in all subsequent work using the FBI results. The CFRTF encourages the IRT to do the same.

## **Area and Scale**

To have sufficient resolution and to help guide decisions about where to make further project scale flood risk reduction investments the Flood Benefits Index must be calculated for smaller, rather than larger areas. Watershed scale calculations are not useful for project planning, because flood risk reduction projects do not typically benefit an entire watershed. The index should be calculated for U. S. Census Tracts, which typically have populations ranging from 2,500 to 8,000 people. Unlike watersheds, which vary vastly in size, Census Tracts are, by design, roughly similar within a population range. This is advantageous to spatial equity analysis.

## **Construction Costs**

Cumulative construction costs should span the longest time period for which records are reasonably available. All costs should be inflation adjusted to reflect 2020 dollars. All construction costs should be subdivided and assigned to individual Census Tracts as outlined above, with costs allocated by area ratio if a project spans more than one tract. Construction costs should only include projects that reduced the annual chance of inundation of residential structures within the Census Tract. To make the data collection effort less burdensome, maintenance, rehabilitation, replacement, or repair projects should be excluded from the calculations. The CFRTF acknowledges that prolonged periods of deferred

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<sup>4</sup> CFRTF By-Laws, Article III.8.b.

maintenance will result in reduced project effectiveness; and, thus a higher risk of inundation for residences served by the project. The CFRTF believes that this diminishment in project effectiveness would generally be minor for projects addressing the 1% annual chance storm event. The CFRTF acknowledges that the diminishment in project effectiveness for projects addressing more frequent, smaller storms, might be significant. This omission could lead to slightly lower calculated FBI values in project areas with excluded operations and maintenance costs and slightly higher inundation risk levels. The CFRTF will note this fact in all subsequent work using the FBI results. The CFRTF encourages the IRT to do the same.

### **Population Density**

Population density should be calculated using the population associated with each corresponding Census Tract obtained from the most recent estimate or count from the U. S. Census divided by the area of the Census Tract.

### **Flood Risk**

Flood risk should be estimated for residences located inside each Census Tract. The current flood risk of all residences in a Census Tract should be determined in the same or similar manner that is used in applications for Community Development Block Grant (CDBG) funds from the U. S. Department of Housing and Urban Development (HUD). HUD requires Census Tract level analysis of flood risk. The area weighted average of flood risk should be used to represent the flood risk of the Census Tract. The FBI calculations should be updated using refined flood risk levels from **MAAPNext** data products when available.

### **Requested Information**

The following data are requested:

- **Raw Input Data**
  - **Census Tract ID.** The U.S. Census Bureau reference number.
  - **Construction Costs.** Total inflation adjusted construction costs incurred by the City of Houston and incurred by HCFCD, within each Census Tract for each project.
  - **Population.** The most recent estimate or count from the Census Bureau for each Census Tract.
  - **Census Tract Area.** The area of each Census Tract.
  - **Current Flood Risk.** The probability of residential inundation within each Census Tract.
- **Construction Cost Calculation Spreadsheet**
  - **Projects.** Project name and lead agency.
  - **Costs for Each Project.**
    - Project cost incurred by City of Houston.
    - Project costs incurred by HCFCD.
  - **Benefitted Area.** Census Tracts with reduced flood risk from each project.
  - **Cost per Census Tract.**
    - Project costs incurred by City of Houston inside each Census Tract.
    - Project costs incurred by HCFCD inside each Census Tract.



- **FBI Calculation Spreadsheet**
  - o Calculation of total construction costs within each Census Tract.
  - o Calculation of population density for each Census Tract.
  - o Calculation of FBI for each Census Tract.
- **Raw Shapefiles and Map Exhibit**
  - o Census Tract Boundary Polygons;
  - o Bayous and Channels lines;
  - o Watershed Boundaries polygons;
  - o Major Highways and Roads lines; and,
  - o Color Shading of Census Tracts Corresponding to FBI Values.<sup>5</sup>

### **Relationship to IRT Work Efforts and Deliverables**

This request will also assist the CFRTF in preparing its pending ***Equity Analysis Proposal*** to the IRT. This request will also assist the CFRTF and the IRT as we collaboratively prepare the ***Analysis of Baseline Conditions***.

### **Schedule**

We request that a first draft of the requested information listed above be provided by August 23, 2021. This will allow the Equity & Metrics Committee to review the materials and full CFRTF review and consider the materials at its meeting scheduled for September 23, 2021. Please advise if this date is not possible.

### **Conclusion**

The purpose of this memorandum was to clarify the CFRTF's request for data to support the calculation of the CFRTF proposed Flood Benefits Index (FBI) for both HCFCF flood protection systems and for City of Houston drainage systems. This memorandum also formally requests that HCFCF and the City of Houston meet with the Chair and Vice Chair of the CFRTF Equity and Metrics Committee (Michael Bloom and Dr. Earthea Nance) at least once to review the information in this memorandum and to discuss this data request.

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<sup>5</sup> Suggest providing a green to yellow to red gradient scale with five to ten divisions.

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# IRT BASELINE CONDITIONS FEEDBACK

The CFRTF and the IRT held a series of 4 workshops in March 2022, to discuss the development of the baseline conditions of the Preliminary Flood Resilience Report, associated community engagement, and approaches to flood resilience. This document reflects the guidance provided by the CFRTF to HCFCD and the IRT on those topics.

**The Infrastructure Resilience Team and Harris County Flood Control District have reviewed this information and are considering the Task Force’s guidance as they develop the Preliminary Flood Resilience Report and associated community engagement.**





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May 16, 2022

**Dr. Tina Petersen**, Executive Director  
Harris County Flood Control District  
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Dear Dr. Petersen, Vanessa, and Infrastructure Resilience Team (IRT) members,

Thank you very much for holding the four (4) IRT Workshops in March 2022 and facilitating collaboration between the IRT and the Community Flood Resilience Task Force (CFRTF). The CFRTF is eager to continue working together to further Harris County's flood resilience efforts.

Please see the following notes from the CFRTF regarding the workshop content. The comments are divided into the following three categories: the IRT's Preliminary Flood Resilience Report, guidance for developing the Flood Resilience Plan, and guidance for stakeholder engagement. We recognize that not all of these ideas may be implementable in the near-term but we look forward to working with the IRT to prioritize what is possible in the short-term and work to make progress towards these ideas in the long-term.

All of the following comments stem from the following **key priorities of the Task Force**:

- Ensure equitable inclusion of the most vulnerable Harris County residents in flood risk assessments as we address the needs of all Harris County residents
- Integrate nature-based solutions in concert with innovative engineered solutions for flood mitigation and preserve natural infrastructure that provides flood mitigation where possible
- Promote connectivity and coordination between County and City Departments to strengthen resilience and recovery efforts
- Improve transparency in government operations and equitable funding allocation
- Promote the establishment of effective and regular systems for communication between the county and the community
- Harmonize regulation efforts with surrounding counties and agencies

*Please note, these ideas were drawn from member comments and themes made regarding the Workshop content and were not put to an official vote.*

## **PRELIMINARY FLOOD RESILIENCE REPORT**

The following guidance focuses on identifying gaps in data and how data can be captured and applied more effectively to better understand the compounding vulnerabilities of Harris County communities. The tasks refer to the Harris County Commissioners Court letter approving the creation and mandate of the IRT passed on 9/15/2020.

### **Task A: Data and Resources**

- 1. Expand the scope of the social vulnerability index to capture more data on high risk groups.**
  - **Use home ownership** as an indicator for assessing vulnerability with the purpose of ensuring renters are not overlooked in the allocation of funds as the social vulnerability index does not take into account homeownership.
  - Use the [2020 ALICE National Report](#) to inform the vulnerability assessment and funding allocation.
  - Identify data sets that show the **mental health** impacts of disasters
  - Use **vehicle ownership** as an indicator for assessing vulnerability, as access to public transportation is limited during and after a storm.
  - Take into account the **distance from stations, conditions of walking/biking infrastructure, and destinations** in the transportation access analysis. Station“access” should be measured as ¼ mile from stops and ridership rates should be examined to determine which areas rely the most on public transportation. The IRT could utilize reports on equitable transit from LINK Houston for best practices.
  - Include **access to information**, e.g. internet, television and radio in preferred language, when analyzing vulnerability.
  - Use the **Federal Highway Administration’s Vulnerability Assessment** and Adaptation Framework to determine the vulnerability of transportation infrastructure as well as capture demographic data from the 2020 census.
- 2. Collaborate with Harris County Flood Control District (HCFCD), IRT, and Equity + Metrics Committee to develop the Flood Mitigation Benefits Index (FMBI), in order to better understand mitigation investments and current inundation risks.**
- 3. Analyze how vulnerability shifts during a major storm event.**
  - Assess vulnerability **during a flood event**, as well as in normal conditions. When communities flood, so do their essential services. Libraries and community centers are non-operational during large storms and therefore should not be considered a resource at that time. For example, determine if Harris County

community centers and neighborhood clinics are **self-sustaining** due to power outages that may occur.

- Assess how floods affect **transportation** during and after a storm.
- Assess current capacity for wellness checks to high-vulnerability populations immediately after a disaster.

**4. Incorporate information provided by MAAPNext about the level of flood risk outside of the floodplain.**

**Task B: Baseline Conditions**

- 1. Create composite heat map to identify “hotspots”,** i.e. areas with low prior investment, high existing inundation risk, high social vulnerability, and low community resources.
  - **Overlay data** from FMBI, SVI, MAAPNext Annual Chance of Inundation, and community resources (access to Food, community centers, transportation, medical services)
- 2. Report the flood risk (annual chance of inundation) by census tract for the entire county.**
  - Risk should be based on all types of flooding sources, including:
    - Riverine (bayou out of banks)
    - Pluvial (flooding from high rainfall in an area) similar to urban flooding but in less developed areas)
    - Coastal Flooding (from storm surge)
    - Urban Flooding (from high rainfall)
- 3. Develop a comprehensive definition of “flood resilience” that defines the meanings of key terms such as: mitigate, prepare, respond, “hotspots,” and recover.**

**Task C: Key Performance Measures for Flood Risk Reduction Projects and Project Funding**

- 1. Measure the number of people in the area benefited by proposed projects** (larger number of people is better.)
- 2. Measure the change in annual chance of flooding in the area benefited by proposed projects** (Larger percentage change is better.)
- 3. Inventory possible funding sources and options to help inform the development of flood mitigation and protection innovations and new projects.** How much more flood risk reduction and resiliency efforts can we afford?



- Estimate the likely and feasible amount of additional Harris County Flood Control District funding (additional bond funding and local taxes) that could be allocated from 2024 to 2050.
- Gather information from **Houston Public Works** on the transition of Maintenance and Infrastructure funding.
- Identify all potential grant funding partners and track opportunities closely.
- Determine where the resilience plan priorities are in alignment with various funding partner agencies' goals and where they are not.
- Create a plan that identifies different approaches needed when local goals are not aligned with appropriate funding partners goals.
- identify funding sources that are not traditionally associated with flood resilience.

## GUIDANCE FOR THE FLOOD RESILIENCE PLAN

The following guidance promotes increased community feedback loops, a stratified approach to resiliency efforts, leading with nature-based solutions, and calls for higher levels of transparency and coordination within the government.

### 1. **Build community engagement capacity regarding flood resilience issues through creating opportunities and communication feedback loops for community input on the County's efforts.**

- Begin engagement **before plans are developed**, to assess community needs, priorities, and opportunities.
- Provide **regular updates** to residents with simple language on the progress of projects. Make sure community members know exactly what has been accomplished.
- Create **real-time feedback opportunities** for organizations and community engagement groups. Design inclusive and participatory strategies and explain to potential participants how their input will be used.
- Identify and utilize **community liaisons** and neighbors to relay information to hard-to-reach residents. It is important that the people engaging the community be connected to the community.
- **Include budget for community engagement** in the County budget to ensure community representation and voice.
  - This budget should include staff and consultant time to design an engagement plan, gather feedback, and document the responses of community members, and resources to ensure inclusive access, including childcare or rides to the event.
- **Train community groups and collectives** on how government and funding works so they are better able to advocate for their community's needs.
- Strategically **engage the media** to better communicate technical information and on-going work.

**2. Develop systems for transparency and community input around project and funding decisions**

- Involve **super neighborhoods and other community groups** in the design of community engagement strategies, especially those that relate to funding allocation decisions.
- Define a **communications strategy** that includes ensuring people from the community join the Capital Improvement Plan (CIP) and Storm Water Action Team (SWAT) Meetings.

**3. Focus on nature-based solutions and infrastructure projects.**

- **Prioritize funding and resources** to maintain and complete natural infrastructure projects such as Exploration Green, the Woodlands, and the Katy Prairie.
- Consider expanding protection of floodways and floodplains over the long-term, i.e., acquiring structures as they are removed from the floodplain to add to the overall resiliency efforts
- Develop a **system of incentives and disincentives** to address the conversion of surrounding farmland into development
- **Strengthen stream corridors** through stabilizing banks with natural features and habitats
- **Transform under-used land** into urban forests/open spaces that can double as floodable parks.
- **Create greenways** along waterways to build resilience as well as provide recreational, environmental and social co-benefits.

**4. Promote amendments and harmonization of standards and regulation to encourage regional flood mitigation**

- Ensure Harris County, the City of Houston, and all communities in our watersheds **develop standards compatible** with the 2018 Minimum Standards set forth by the HCFCD.
- Determine if funding is available to subsidize the work of the Community Service Department in following the 2018 Standards.
- Impose strict floodplain management rules for all new developments and redevelopments.

**5. Develop effective systems for community preparedness during all stages of the Disaster Management Cycle.**

- Improve systems of conveying relevant **information and service contacts** to community members, including who to contact for help.
- Support current City/County/Long-Term Recovery Committee (LTRC) efforts for an unified damage and needs assessment survey to be deployed immediately after disaster events.
- **Leverage existing networks and Community Based Organizations (CBOs)** to support government efforts

- Coordinate with **Super-Neighborhood Councils** to create feedback loops within their communities and to disseminate accurate information.
- Coordinate and collaborate with **Long-term Recovery Committee (LTRC) member organizations** and with local social service nonprofits, and grassroots organizations for response and recovery efforts. Build these relationships year-round.
- Provide support to **community and neighborhood-based leaders** on how to assist communities most proactively in advance of a disaster.
- Expand the organizations and systems included in the “Texas Gulf Coast Region Voluntary Organizations Active In Disaster” (TGCRVOAD)
  - Add **HUD, TWDB, and USACE** to mitigation plans.
  - Add the **TXDOT** and the **County Toll Road** system to each type of support.
  - Add **Pollution Control** under response for industrial accidents to ensure safe cleanup following a disaster.

**6. Reduce eligibility barriers for disaster recovery assistance wherever possible.**

- Ensure **eligibility for home repair assistance** is not tied to a specific event as there are often compounding disasters. This could be achieved by leveraging local and flexible funds to support those experiencing damages from previous disasters and/or influencing local CDBG-DR action plans.
- Reduce time delay between each flooding disaster and the delivery of assistance to impacted facilities, people, and buildings.
- Ensure housing counseling and cash assistance is made **immediately available** after a disaster. Local CBOs are well positioned to provide these services.
- Prioritize the repair of damaged flood mitigation infrastructure based on the flood risk reduction achieved
- **Accelerate repair permits** during the recovery cycle.

**7. Address the “hotspots”,** i.e. areas with low prior investment, high existing inundation risk, high social vulnerability, and low community resources. *See Task B: Baseline Conditions, item 1 for more information.*

## STAKEHOLDER ENGAGEMENT GUIDANCE

Centering people (especially those disproportionately affected) in the planning, development and implementation of projects leads to more effective solutions and strategies. The following guidance focuses on equitable, representative, and effective community engagement implementation.

**1. Select representative stakeholders based on varied geographic locations, lived experiences and subject expertise to provide a more holistic perspective.**

- List stakeholders per **geographic quadrant** to ensure expertise is spread across the County.

- Reach out and include local civic club presidents, neighborhood liaisons, City/County agencies that have participated in development/community engagement efforts in target areas to elevate previous concerns and requests from community members.
  - Ensure the stakeholder list includes **experts on resilience programs** - e.g. a climatologist who understands the future of Harris County's climate, civil engineers, etc. to gather expert policy input.
2. **Conduct workshops in areas hardest hit by flooding and ensure that access to the workshops is equitable.**
    - Consider the unique needs of participants, including transportation, **multilingual translation**, and childcare support to ensure access to the workshops is equitable.
  3. **Be intentional about public engagement methodology**
    - a. Design a participatory and inclusive workshop
    - b. Value qualitative data, as it provides the context that quantitative data cannot.
    - c. Clarify for potential participants how their input will be used on the front end of this process and report back when done
  4. **Utilize Task Force members and committee members for facilitation support of breakout groups.**

We look forward to seeing the development of the baseline conditions into the Preliminary Flood Resilience Report near the end of this year. Please let us know how we can be of assistance; we are willing and available to assist in whatever capacity we can.

Sincerely,



**Kenneth Williams**  
Chair



**Elaine Morales-Diaz**  
Vice-Chair



**Yasmeen Davila**  
Secretary



# FLOOD RESILIENCE REPOSITORY

The Overall Approach Committee—led by Mary Anne Piacentini and Elaine Morales-Díaz—compiled this repository as a resource for the CFRTF and the IRT. It includes plans, reports, research, and community engagement related to previous flood resilience efforts within Harris County.

**The Infrastructure Resilience Team has received this information and is reviewing the contents as they progress their work.**

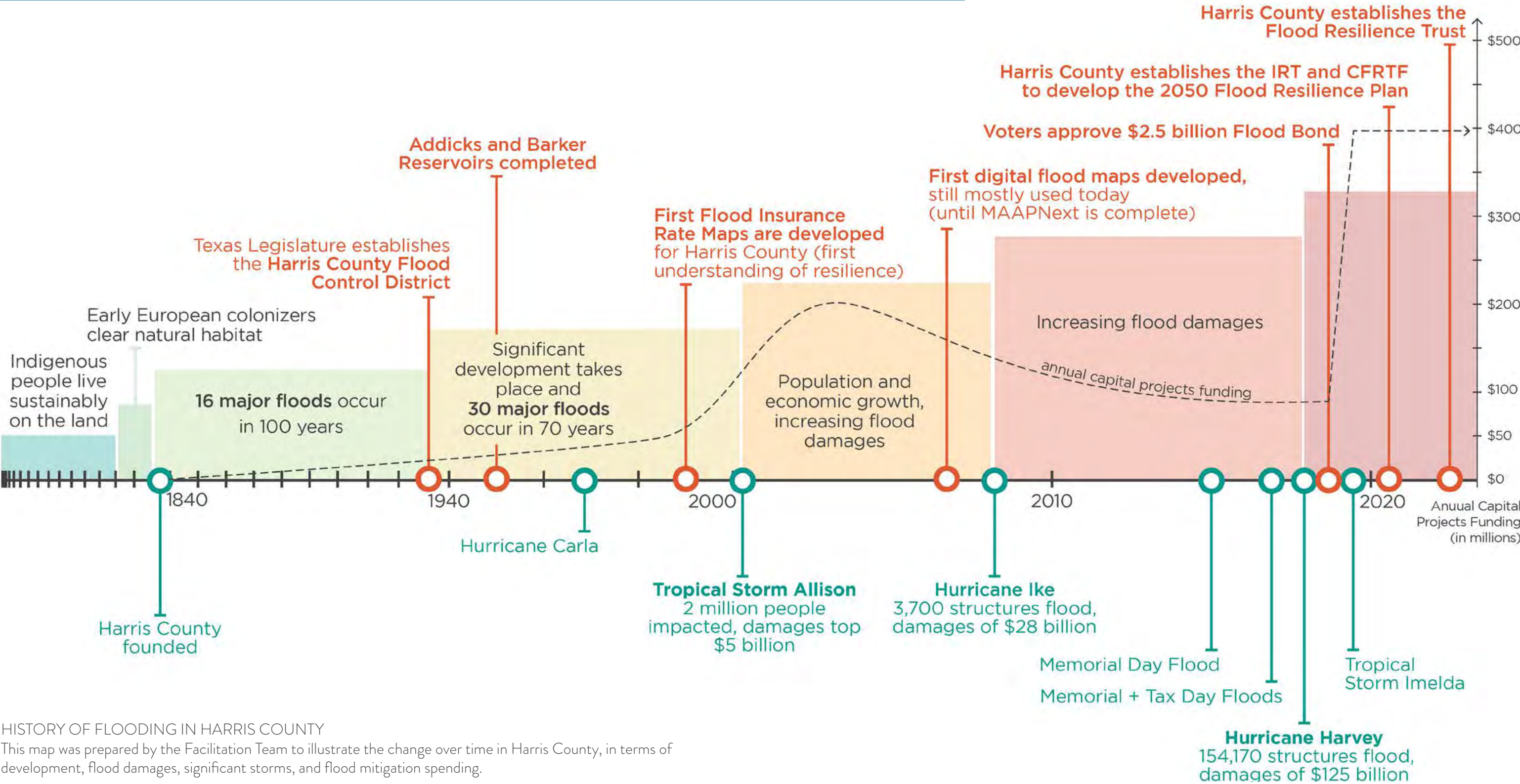
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Flood Resilience Repository					
Type of Data or Report	Topic Area	Title	Location(s)	Created by	Link
Projects	Infrastructure	City of Houston Capital Improvements Projects Investments by District	City of Houston	City of Houston	<a href="https://docs.g">https://docs.g</a>
Reports/Research	Infrastructure	Natural Infrastructure Brochure	Greater Houston Region	Conservation Flood Mitigation Group with initial research from National Wildlife Federation	PDF
Reports/Research	Infrastructure	The Protective Value of Nature	United States	National Wildlife Federation	<a href="https://www.n">https://www.n</a>
Other	Innovations	Projects to Reduce Flood Risk	United States	Katy Prairie Conservancy	PDF
Reports/Research	Other	Various Titles	Greater Houston Region	Greater Houston Flood Mitigation Consortium	<a href="https://houstc">https://houstc</a>
Reports/Research	Flood Risk Reduction	Prairie Solution to Reduce Flooding	Greater Houston Region	Phil Bedient and Larry Dunbar, SPPEED Center for KPC	PDF
Reports/Research	Other	Cypress Creek Analysis of Flooding and Storage Options	Cypress Creek	SPEED Center and TSU	<a href="#">PDF</a>
Reports/Research	Vulnerabilities	West Street Recovery: Survivors as Experts	Northeast Houston	West Street Recovery	<a href="#">PDF</a>
Policy	Equity	Policy Brief on Flood Benefits Index	Harris County	CEER	on CEER's w
Policy	Equity	Policy Brief - Flood Equity Framework	Harris County	CEER	on CEER's w
		Talking Transition town halls	Harris County	Harris County Judge Hidalgo's office	?
Other	Equity	List of questions from Northeast Houston neighborhoods and HCFCF response	Harris County	CEER, in collaboration with Northeast neighborhood leaders	<a href="https://drive.g">https://drive.g</a>
Other	Equity	Recommendations to improve Harris County's mandatory buyout program	Harris County	CEER	<a href="https://drive.g">https://drive.g</a>
Other	Infrastructure	Helpful HCFCF Links	Harris County	HCFCF	<a href="https://docs.g">https://docs.g</a>
Articles	Equity	Five ways to ensure flood-risk research helps the most vulnerable	United States	Dr. Earthea Nance	<a href="#">Five ways to flood-risk res</a>
Tools	Equity	Resident Leadership Development Educational Module on Flooding	Houston/Harris County	buildingcommunityWORKS HOP & TOP	<a href="https://issuu.c">https://issuu.c</a>
Reports/Research	Equity	HOUSTON HCDD: Harvey CDBG Community Engagement Report	Houston	buildingcommunityWORKS HOP & Houston Housing and Community Development Department	<a href="https://houstc">https://houstc</a>
Reports/Research	Flood Risk Reduction	Living with Water Convening: Resilient Houston	Houston	City of Houston Consultant Team	<a href="https://www.h">https://www.h</a>
Tools	Flood Risk Reduction	Residential Flood Risk Tool	Harris, Waller, Fort Bend, Montgomery, Galveston Counties	Moksha Data & Connective (former Harvey Home Connect)	<a href="https://www.n">https://www.n</a>
Articles	Vulnerabilities	Natural Disasters Risk in Houston	Houston	Understanding Houston	<a href="https://www.u">https://www.u</a>
Reports/Research	Flood Hazards	Houston Flooding 3.5 years after Harvey	Houston	Baker Institute of Public Policy	<a href="https://www.b">https://www.b</a>
Reports/Research	Other	Talking Transition Survey Results	Harris County	HR&A and Harris County	<a href="https://cjo.har">https://cjo.har</a>
Visuals (maps)	Flood Hazards	Uneven Runoff Interactive Map	Harris County	Rice University	<a href="https://ricegis">https://ricegis</a>
Visuals (maps)	Flood Hazards	Flood Warning System Interactive Maps	Harris County	Flood Control District	<a href="https://www.h">https://www.h</a>
Visuals (maps)	Vulnerabilities	Hurricane Harvey's Environmental Impacts Summary Maps	Harris County	Houston Advanced Research Center (HARC)	<a href="https://harcre">https://harcre</a>
Visuals (maps)	Flood Hazards	Interactive Map Catalog of Flood Risk	Texas	Institute for a Disaster Resilient Texas	<a href="https://tamu.r">https://tamu.r</a>
Visuals (maps)	Flood Hazards	Hurricane Harvey Flood Maps	Harris County	Rice University	<a href="https://ricegis">https://ricegis</a>
Visuals (maps)	Flood Hazards	Flood Education Mapping Tool	Harris County	Flood Control District	<a href="https://www.h">https://www.h</a>
Other	Other	2018 Bond Program Comm. Engagement Meetings (individual Watersheds) Summary Reports/ Cut Sheets	Harris County	Flood Control District	<a href="#">FINAL-Bond-Pr</a>

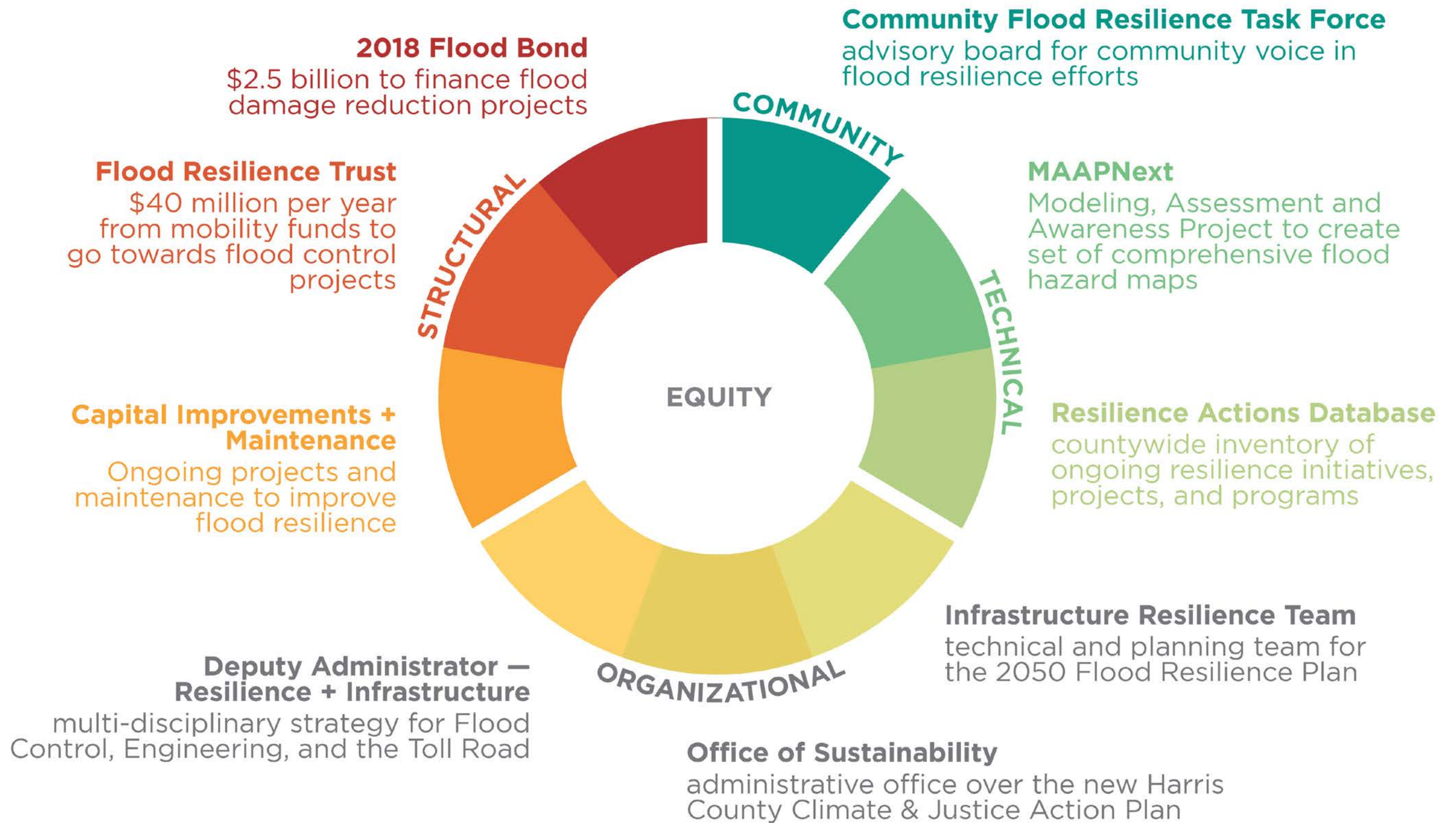
Submitted by	Notes
Laura Patiño	
Mary Anne Piacentini	PDF is in this folder: <a href="https://drive.google.com/drive/folders/1DEln49_xFX1msgQHuhYg7eiRnOVf4kcB?usp=sharing">https://drive.google.com/drive/folders/1DEln49_xFX1msgQHuhYg7eiRnOVf4kcB?usp=sharing</a>
Mary Anne Piacentini	
Mary Anne Piacentini	Projects that KPC has researched from around the country that provide innovations and projects to reduce flood risk. <a href="https://drive.google.com/drive/folders/1DEln49_xFX1msgQHuhYg7eiRnOVf4kcB?usp=sharing">https://drive.google.com/drive/folders/1DEln49_xFX1msgQHuhYg7eiRnOVf4kcB?usp=sharing</a>
Mary Anne Piacentini	studies that consortium did on various aspects of flooding and on various neighborhood plans. Includes reports on the Cypress Creek Watershed Analysis of Flooding & Storage Options, Drainage, Detention, and Development Regulations, Affordable Multi-Family Housing: Risks and Opportunities, Strategies for Flood Mitigation in Greater Houston, Edition 1, Greater Houston Flood Mitigation Projects By Watershed, Fact Sheets and Briefing, along with resilience plans for four Houston neighborhoods.
Mary Anne Piacentini	Recommendations for flood risk reduction projects using a combination of natural infrastructure and innovative engineering solutions
Dr. Earthea Nance	Recommendations on regulations to increase detention standard requirements for development.
Iris Gonzalez	Community-based participatory research report from the perspective of flood survivors with recommendations along the entire pipeline of flooding preparedness and recovery.
Iris Gonzalez	Policy brief that provides a tool to determine a baseline of conditions when it comes to flood protection inequities.
Iris Gonzalez	Policy brief that presents a framework to work around the inherently discriminatory Cost Benefit Ratio which leaves low income neighborhoods behind and leaves benefits accrued on the table, instead of applying it to places that need more benefits.
Iris Gonzalez	Can we get notes from the town halls that the Judge held during her first few months in office? I know flooding was a major priority and there were a few town halls organized just around resilience.
Iris Gonzalez	CEER organized a list of commonly asked (and unsatisfactorily answered) questions from Northeast leaders.
Iris Gonzalez	CEER put on a series of information sessions in partnership with Lone Star Legal Aid, Deep South Center for Environmental Justice and Texas Appleseed. The info sessions were trilingual in English, Spanish and Vietnamese.
Craig Maske	
Iris Gonzalez	
Elaine Morales	This material is relevant to the Community Engagement Committee. [bc] & TOP built this tools to create resources for individuals to learn about specific issues including flooding, the disaster recovery process, housing and gentrification. The intent was to build residents expertise in complex topics after Harvey so that they could both understand jargon around these topics, provide informed feedback at community meetings, support community organizing efforts, and empower them to have engaged conversations with local officials and experts.
Elaine Morales	HCDD partnered with local organizations to seek guidance and support in their engagement strategies and outreach. In collaboration with local partners HCDD engaged (in a six week period) more than 800 Houstonians through public meetings, 746 through an online survey, and more than 3,000 people through a tele-townhall co-hosted with AARP with the purpose of creating a local housing recovery Action Plan that was representative of the needs and priorities of Houston residents. This report both looks at the engagement strategy and the public meetings outcomes and resident input. The meetings detailed information documented starts on page 31. First analyzed by City quadrant (page 35) and then with notes on each meeting (page 41).
Elaine Morales	NO COMMUNITY-BASED GROUPS, ORGANIZATIONS OR RESIDENTS were involved on this effort, but the list of companies, firms, and stakeholders involved is included.
Elaine Morales	
Elaine Morales	Data Screener Tool.
Elaine Morales	
Elaine Morales	
Elaine Morales	Summary of Talking Transition effort and the input from the community.
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YEARLY REPORT DIAGRAMS - FULL SIZE

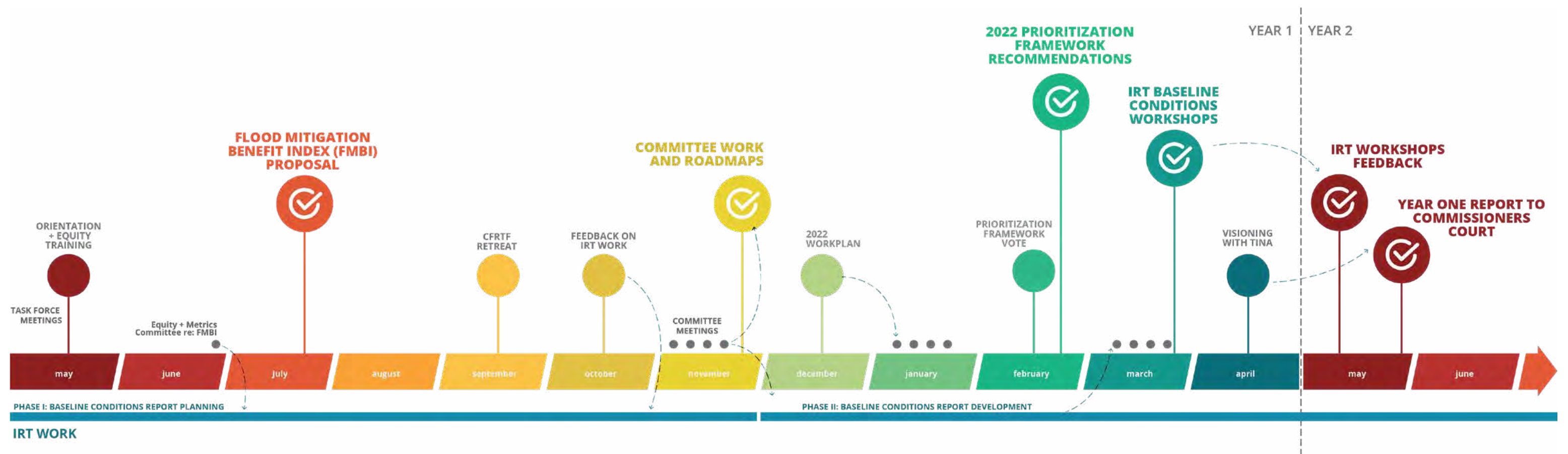






#### HARRIS COUNTY FLOOD RESILIENCE LANDSCAPE

This graphic was prepared by the Facilitation Team to illustrate the array of flood resilience efforts that were currently underway.



## CFRTF YEAR ONE TIMELINE

This graphic was prepared by the Facilitation Team to outline the Task Force’s work for the 2021-2022 year. This shows Task Force meetings, key deliverables, and integration with IRT work.





**FLOOD MITIGATION STRATEGIES**  
 While an array of efforts are underway, current flood resilience efforts focus primarily on channel modifications and detention basins. The CFRTF is looking to see a broader range of solutions—especially nature-based and national infrastructure solutions—beyond the traditional methods.