

CITY OF BELLAIRE TEXAS

PLANNING AND ZONING COMMISSION

APRIL 4, 2018

Council Conference Room

Workshop Session

5:00 PM

7008 S. RICE AVENUE
BELLAIRE, TX 77401



Chairman

Mr. Dirk Stiggins

Commissioner

Jonathan Saikin

Commissioner

Mike Axelrad

Commissioner

Ross Gordon

Commissioner

Weldon Taylor

Vice Chairman

Marc Steinberg

Commissioner

S. Lynne Skinner

Mission Statement:

The City of Bellaire is dedicated to outstanding quality service and facilities to ensure an open, progressive, and secure community.

I. WORKSHOP SESSION**1. Call to Order**

2. Discussion on the City of Bellaire's 2019-2023 Draft Capital Improvement Plan, with an emphasis on incorporating the Flood Hazard Mitigation Report.

3. Public Comments**4. Adjournment**

**Planning and Zoning
Commission**

Council Chamber, First Floor of City
Hall
Bellaire, TX 77401-4411



Meeting: 04/04/18 05:00 PM
Department: Development Services
Category: Discussion
Department Head: ChaVonne
Sampson
DOC ID: 2522

**SCHEDULED
INFORMATION ITEM (ID
2522)**

Item Title:

Discussion on the City of Bellaire's 2019-2023 Draft Capital Improvement Plan, with an emphasis on incorporating the Flood Hazard Mitigation Report.

Background/Summary:

A workshop session is being held to allow for the discussion of the City Manager's proposed draft of the 2019-2023 Capital Improvement Plan, under the authority given to the Commission by Chapter 24, Section 24-402 of the City of Bellaire Code of Ordinances.

Included in the attachments are the recommendations made by the Flood Hazard Mitigation Task Force, as well as a draft action plan for the implementation of those recommendations.

ATTACHMENTS:

- P&Z Workshop - Intro summary (DOCX)
- Draft CIP 1-31-18 (PDF)
- PRAB Memo - Signed (PDF)
- FHTF Recommendations (PDF)
- 20. Draft Action Plan_Matrix Organization (PDF)
- Hazard-Risk Assessment Matrix 3.15.18 (PDF)

5 Year Draft CIP Status Summary

Presented to: Planning and Zoning Commission

Presented on: March 27, 2018

Presented by: Michelle Jordan

1. Available Reports and Recommendations
 - A. Parks and Recreation Advisory Board comments, recommendations, and priorities obtained in February 2018. See attached letter.
 - B. Flood Mitigation Task Force recommendations as presented to Council on March 19, 2018. See attached report summary.
 - C. Staff recommendations on next steps for implementing the recommended projects and studies. See attached chart.
2. Considerations for Discussion on Next Steps
 - A. Bonds for Better Bellaire 2016 Projects are in progress and have been received favorably by the Flood Hazard Task Force (FHTF).
 - B. Many of the projects recommended by FHTF would require additional studies to determine feasibility and cost estimates.
 - C. The Draft 5-year CIP Recommendations chart shows projects that would need additional studies which could potentially be funded by existing cash. These projects do not currently have construction cost estimates; therefore, funding sources and schedules cannot be planned at this time.
 - D. The chart also shows some of the projects that have been identified as candidates for participation in the Texas Hazard Mitigation Grant Program thru the Texas Division of Emergency Management. These projects would likely not be possible if without participation in a large grant program.
3. Recommendations for Discussion
 - A. Identify partner organizations – Many of the recommended activities and projects from the FHTF will require development of partnerships and relationships with other agencies. This process could begin now.
 - B. Plan for Bonds for Better Bellaire 2019 – Continue to plan for a 2019 bond election, which would include a continuation of street and drainage improvement projects like the Bonds for Better Bellaire 2016 Program.
 - C. City of Bellaire staff should try to find a way to fund the identified studies with current cash. Completing these studies will provide cost estimates that are necessary to plan the funding strategy.

Five Year Capital Improvement Plan Summary						
	Projected FY 2019	Projected FY 2020	Projected FY 2021	Projected FY 2022	Projected FY 2023	Totals FY 2018-2022
Resources						
General Fund Cash Resource	1,847,100	671,050	501,050	606,050	155,050	3,625,250
Enterprise Fund Cash Resources	245,977	940,977	5,977	5,977	5,977	1,198,908
METRO Resources	1,008,000	1,008,000	1,008,000	1,008,000	1,008,000	4,032,000
Bonds Program	9,000,000	14,200,000	21,000,000	12,000,000	12,000,000	56,200,000
Total CIP Resources	12,101,077	16,820,027	22,515,027	13,620,027		65,056,158
Projects						
General Fund Cash Projects	1,496,050	320,000	50,000	451,000	-	2,317,050
Enterprise Fund Cash Projects	240,000	935,000	-	-	-	1,175,000
METRO Projects	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	5,000,000
Bond Program	9,000,000	14,200,000	21,000,000	12,000,000	12,000,000	68,200,000
Total Capital Improvement Projets	11,736,050	16,455,000	22,050,000	13,451,000		76,692,050
Unfunded Projects - All General Fund Related						\$ 9,060,000

FY 2019 Proposed Capital Improvement Projects	
General Fund CIP	
Beginning Balance - General Fund Cash	\$ 1,102,100
Transfer in From General Fund	\$ 745,000
Total Resources	\$ 1,847,100
Holly Street Esplanade - Additional amenities and plantings for the Holly Street Esplanade Project. Project includes additional plantings, additions to the irrigation system, and additional site furnishings.	\$ 50,000
Playgrounds, Shade Structures, and Park Amenities - Provides annual funding to address city-wide replacement and/or purchase of new playground equipment, shade structures and park amenities.	\$ 100,000
Park Signage Master Plan and Implementation - Includes all signage used in City of Bellaire Parks. Master Plan would incorporate findings of the Brand Identity Project and provide an important step towards improving the overall aesthetics of the City while improving consistency and quality of park signage.	\$ 150,000
Decorative Standards for Streetlights Pilot Project - This project will provide better street lighting, additional trail lighting, possible use of LED lighting options, and a decorative standard for major streets throughout the City. The initial project will focus on Newcastle Street and trail, and future phases may focus on other major streets and high-traffic areas, as well as standards for other street categories. Plan would incorporate findings of the Brand Identity Project and provide an important step towards improving the overall aesthetics of the City.	\$ 75,000
Signature Corner Design - Conceptual Designs have been provided for the corner of S. Rice Avenue and Jessamine as well as several S. Rice Ave. esplanades. Additional planning and design is needed to identify the proposed improvements. Construction funding would require new bond authority.	\$ 751,050
Loftin Park Improvements - Improvements to Loftin Park including invasive or unhealthy tree removal, additional tree plantings, irrigation system, and fencing improvements.	\$ 170,000
FFE Supplement to offset Impound Lot Project - Improvements to Public Works Facility to accommodate PD impound needs related to the construction of the new Police / Court Building have already been constructed. This funding would reimburse the bond fund that was originally used to fund these improvements.	\$ 100,000
Park Improvements After Municipal Facilities Project - Site Improvements to improve circulation and cohesiveness after completion of construction.	\$ 100,000
Total FY 2019 General Fund CIP	\$ 1,496,050
Ending Balance	\$ 351,050

Attachment: Draft CIP 1-31-18 (2522 : CIP)

FY 2019 Proposed Capital Improvement Projects		
Enterprise Fund CIP		
Beginning Balance	\$	5,977
Transfer in From Enterprise Fund	\$	240,000
Total Resources	\$	245,977
Central Well Pumps - Replace all three booster pumps and motors, which have been rebuilt multiple times and are past their life expectancy. Increased energy efficiency and reduced repairs will provide a return on investment.	\$	240,000
Total FY 2019 Enterprise Fund CIP	\$	240,000
Ending Balance	\$	5,977

FY 2019 Proposed Capital Improvement Projects		
Bond Fund CIP		
Proposed Bonds for Better Bellaire Revenue	\$	9,000,000
Total Resources	\$	9,000,000
Street, Drainage and Sidewalks – The program will continue the City’s practice to design and construct streets and upgrade storm sewers concurrently in one project with sidewalks installed on at least one side of the street.		\$6,000,000
Water and Wastewater Improvements – This program was created from prior utility condition assessments to replace identified water and wastewater lines that are failing to provide the desired level of service due to the deterioration of aging lines.	\$	3,000,000
Total FY 2019 Bond Fund CIP	\$	9,000,000
Ending Balance	\$	-
METRO Fund CIP		
Beginning Balance	\$	8,000
Current Year Revenues	\$	1,000,000
Total Resources	\$	1,008,000
Pavement Management Program – This maintenance program was created from the City Engineer’s Infrastructure Report in 2015 to improve the overall quality of the street and sidewalk systems by repairing or replacing asphalt and concrete pavement.	\$	1,000,000
Total FY 2019 METRO Fund CIP	\$	1,000,000
Ending Balance	\$	8,000
Combined FY 2019 Proposed Capital Improvement Plan		
Total CIP Resources	\$	12,101,077
Total CIP Projects	\$	11,736,050
Total CIP Ending Balances	\$	365,027

Attachment: Draft CIP 1-31-18 (2522 : CIP)

Five Year Capital Improvement Plan

General Fund

Description	FY 2019 Planned	FY 2020 Planned	FY 2021 Planned	FY 2022 Planned	FY 2023 Planned	FY 2018 - FY2022 Totals
Beginning Balance	\$ 1,102,100	\$ 351,050	\$ 351,050	\$ 451,050	\$ 155,050	
Transfer in From General Fund	\$ 745,000	\$ 320,000	\$ 150,000	\$ 155,000	\$ -	\$ 1,370,000
Total Resources	\$ 1,847,100	\$ 671,050	\$ 501,050	\$ 606,050	\$ 155,050	\$ 2,472,100
Holly Street Esplanade - Additional amenities and plantings for the Holly Street Esplanade Project. Project includes additional plantings, additions to the irrigation system, and additional site furnishings on those medians that were not improved in FY 2016.	\$ 50,000	\$ 50,000	\$ 50,000	\$ 100,000		\$ 250,000
Playgrounds, Shade Structures, and Park Amenities - Provides annual funding to address city-wide replacement and/or purchase of new playground equipment, shade structures and park amenities.	\$ 100,000	\$ 100,000				\$ 200,000
Park Signage Master Plan and Implementation - Includes all signage used in City of Bellaire Parks. Master Plan would incorporate findings of the Brand Identity Project and provide an important step towards improving the overall aesthetics of the City while improving consistency and quality of park signage.	\$ 150,000	\$ 100,000				\$ 250,000
Decorative Standards for Streetlights Pilot Project - This project will provide better street lighting, additional trail lighting, possible use of LED lighting options, and a decorative standard for major streets throughout the City. The initial project will focus on Newcastle Street and trail, and future phases may focus on other major streets and high-traffic areas, as well as standards for other street categories. Plan would incorporate findings of the Brand Identity Project and provide an important step towards improving the overall aesthetics of the City.	\$ 75,000					\$ 75,000
Signature Corner Design - Conceptual Designs have been provided for the corner of S. Rice Avenue and Jessamine as well as several S. Rice Ave. esplanades. Additional planning and design is needed to identify the proposed improvements. Construction funding would require new bond authority.	\$ 751,050					\$ 751,050
Loftin Park Improvements - Improvements to Loftin Park including invasive or unhealthy tree removal, additional tree plantings, irrigation system, and fencing improvements.	\$ 170,000					\$ 170,000
Ware Park Picnic Pavilion - Picnic pavilion design and construction at Ware Park.		\$ 70,000				\$ 70,000
Paseo Park West Expansion - Park expansion would be possible with future relocation of Metro transit center. Funding is restricted and can only be used to develop new park facilities.				\$ 351,000		\$ 351,000

Five Year Capital Improvement Plan						
General Fund						
Description	FY 2019 Planned	FY 2020 Planned	FY 2021 Planned	FY 2022 Planned	FY 2023 Planned	FY 2018 - FY2022 Totals
FFE Supplement to offset Impound Lot Project - Improvements to Public Works Facility to accomodate PD impound needs related to the construction of the new Police / Court Building have already been constructed. This funding would reimburse the bond fund that was originally used to fund these improvements.	\$ 100,000					\$ 100,000
Park Improvements After Municipal Facilities Project - Site Improvements to improve circulation and cohesiveness after completion of construction.	\$ 100,000					\$ 100,000
Total General Fund CIP Expenditures	\$ 1,496,050	\$ 320,000	\$ 50,000	\$ 451,000	\$ -	\$ 2,317,050
Total General Fund CIP Ending Balance	\$ 351,050	\$ 351,050	\$ 451,050	\$ 155,050	\$ 155,050	

Five Year Capital Improvement Plan

Enterprise Fund

Description	FY 2019 Planned	FY 2020 Planned	FY 2021 Planned	FY 2022 Planned	FY 2023 Planned	FY 2018 - FY2022 Totals
Beginning Balance	\$ 5,977	\$ 5,977	\$ 5,977	\$ 5,977	\$ 5,977	
Transfer from Enterprise Operations Fund	\$ 240,000	\$ 935,000	\$ -	\$ -	\$ -	\$ 1,175,000
Total Resources	\$ 245,977	\$ 940,977	\$ 5,977	\$ 5,977	\$ 5,977	\$ 1,180,977
Central Well Pumps - Replace all three booster pumps and motors, which have been rebuilt multiple times and are past their life expectancy. Increased energy efficiency and reduced repairs will provide a return on investment.	\$ 240,000					\$ 240,000
Central Well Control Panel - Replace Control Panel that controls Booster Pumps 1, 2, and 3. Replace or run new wiring as needed due to abandoned runs, previous splices, and out dated components.		\$ 500,000				\$ 500,000
Feld Park Well - Add a new standby diesel generator, improving for health and safety of City water supply and fire fighting capabilities. Feld Park provides groundwater and is also the only other supply of surface water for the City. A standby generator will allow the City to have two operable groundwater and surface water sources readily available in the event of a power outage.		\$ 435,000				\$ 435,000
Total Enterprise Fund CIP Expenditures	\$ 240,000	\$ 935,000	\$ -	\$ -	\$ -	
Total Enterprise Fund Ending Balance	\$ 5,977	\$ 5,977	\$ 5,977	\$ 5,977	\$ 5,977	

Attachment: Draft CIP 1-31-18 (2522 : CIP)

Five Year Capital Improvement Plan						
Bond Fund						
Description	FY 2019 Planned	FY 2020 Planned	FY 2021 Planned	FY 2022 Planned	FY 2023 Planned	FY 2018 - FY2022 Totals
Current Year Revenues	\$9,000,000	\$14,200,000	\$21,000,000	\$12,000,000	\$12,000,000	\$68,200,000
Total Resources	\$9,000,000	\$14,200,000	\$21,000,000	\$12,000,000	\$12,000,000	\$68,200,000
Street, Drainage and Sidewalks – The program will continue the City’s practice to design and construct streets and upgrade storm sewers concurrently in one project with sidewalks installed on at least one side of the street.	\$6,000,000	\$6,000,000	\$6,000,000	\$8,000,000	\$7,000,000	\$33,000,000
Sidewalk Improvements – Funding for this program is separate from street, drainage and sidewalk projects. The focus is to design and construct sidewalks that improve the overall quality and connectivity of the sidewalk system, fill in gaps and update existing sidewalks to meet the Americans with Disabilities Act (ADA) guidelines.		\$1,000,000	\$1,000,000	\$1,000,000	\$1,500,000	\$4,500,000
Water and Wastewater Improvements – This program was created from prior utility condition assessments to replace identified water and wastewater lines that are failing to provide the desired level of service due to the deterioration of aging lines.	\$ 3,000,000	\$ 3,000,000	\$ 3,000,000	\$ 3,000,000	\$ 3,500,000	\$15,500,000
Wastewater Treatment Plant Electrical - Replacement of the control panel and components. The current control panel is the original panel installed during the construction of the facility to operate the various pumps and motors that run the WWTP. The electrical wiring and components have exceeded their life expectancy. It is recommended to upgrade the electrical wiring, breakers, starters, and include modern smart controls.		\$ 1,200,000				\$1,200,000
Bellarire Library - Design and Construction of a new library building located along Jessamine Street. The new facility will be a part of the overall City Of Bellair campus.		\$ 500,000	\$ 4,000,000			\$ 4,500,000
Public Works Building - Funding for (potential) land acquisition, design, and construction of a building to house the administrative staff for the public works department.		\$ 1,000,000	\$ 3,000,000			\$4,000,000
Park Improvements - Additional needs at other parks in the COB system, including restrooms, lighting, parking lots, and various other amenities.		\$1,000,000				\$1,000,000
Evergreen Park - Per the Evergreen Park Master Plan, this project includes design and construction of the Park.		\$500,000	\$4,000,000			\$4,500,000
Total Bond Fund CIP	\$9,000,000	\$14,200,000	\$21,000,000	\$12,000,000	\$12,000,000	\$68,200,000
Total Ending Balance	\$-	\$ -	\$-	\$-	\$-	

Five Year Capital Improvement Plan

METRO Fund

Description	FY 2019 Planned	FY 2020 Planned	FY 2021 Planned	FY 2022 Planned	FY 2023 Planned	FY 2018 - FY2022 Totals
METRO Sales Tax Beginning Balance	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000
Current Year Revenues	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 4,000,000
Total Resources	\$ 1,008,000	\$ 1,008,000	\$ 1,008,000	\$ 1,008,000	\$ 1,008,000	\$ 4,032,000
Pavement Management Program – This maintenance program was created from the City Engineer’s Infrastructure Report in 2015 to improve the overall quality of the street and sidewalk systems by repairing or replacing asphalt and concrete pavement.	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 4,000,000
Total Expenditures	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 4,000,000
Total Ending Fund Balance	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$32,000

Future Projects		
Description		Estimated Budget
<i>*Cost estimates should be reevaluated as projects are identified as funded and schedules are identified, as inflation will impact these estimates.</i>		
South Rice Esplanade Improvements - Improvements to the four esplanades along South Rice at Bellaire Boulevard and Bissonnet St. Project to include design and construction of mow strips, additional planting, edging, mulch, and other landscape improvements.	\$	120,000
9/11 World Trade Center Steel Project Construction - Donations have been received by the Rotary Club to fund the preliminary design of a plaza intended to display pieces of steel from the World Trade Center. The pieces are currently stored in the City's Impound Facility and show signs of damage from the attack on September 11, 2001. Construction costs will be more accurately estimated after preliminary design is completed.	\$	250,000
Signature Corner Construction - Conceptual Designs have been provided for the corner of S. Rice Avenue and Jessamine to include the S. Rice Esplanade Jessamine to Bellaire. Construction funding to be identified in the future.	\$	3,000,000
Bellaire Town Square - Upgrade / Automate Ball Field Lights, Poles, & Netting	\$	500,000
Bellaire Town Square - Upgrade / Automate Tennis Court Lighting and Tennis Court Resurfacing	\$	250,000
Bellaire Town Square - Rec. Center Renovation Design - Programming and design of key improvements to the Bellaire Recreation Center Building	\$	120,000
Bellaire Town Square - Rec. Center Renovation Construction - Key improvements to include accessibility upgrades and general renovations	\$	800,000
Bellaire Town Square - Concession Stand Renovation	\$	50,000
Mulberry Park - Restroom Facility	\$	200,000
Mulberry Park - Replace tennis fencing, upgrade and automate lighting and resurface tennis court	\$	300,000
Mulberry Park - Upgrade / Automate Ball Field Lighting	\$	300,000
Mulberry Park - Parking Lot Replacement	\$	450,000
Feld Park Renovation Design - Park improvements including parking lot, sidewalks and paths, fencing and sports fields/courts	\$	150,000
Feld Park Construction - Park improvements including parking lot, sidewalks and paths, fencing and sports fields/courts and ball field lighting	\$	1,500,000
Vic Driscoll Park - Pathway Lighting		70,000

Future Projects		
Description		Estimated Budget
Trolley Esplanade Renovation - Improvements to include general and specialized lighting, sidewalks and paths, drainage, signage and interpretive graphics, and trolley area improvements in Paseo Park.		\$ 1,000,000
Total Unfunded		\$ 9,060,000

TO: City of Bellaire Planning and Zoning Commission
FROM: Sharon Veldman, Chair of Parks and Recreation Advisory Board
DATE: March 15, 2018
SUBJECT: Recommendations for the FY 2019 - 2023 Capital Improvement Program

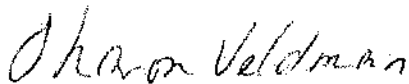
The Parks and Recreation Advisory Board has reviewed the draft CIP for Fiscal Years 2019 thru 2023 and has approved the plan, but has noted several recommendations for consideration.

- Holly Street Esplanade Project – Remove funds from FY 2019, add to FY 2020. Remove funds from FY 2021, add to FY 2022.
- Park Signage Master Plan and Implementation – Remove funds from FY 2019, add \$50,000 to FY 2020 and \$100,000 to FY 2021.

In addition to the above recommendations, PRAB also prioritizes FY 2019 projects as follows with the understanding that available funding for these projects may be limited:

1. Park Improvements after Municipal Facilities Project - \$100,000 to be used to improve Bellaire Town Square, the Great Lawn, and areas of Loftin Park impacted by the Municipal Facilities Project and to maintain consistency with the Parks Master Plan.
2. Bellaire Family Aquatic Center - \$150,000 to be used for deck expansion, storage solutions, and additional seating and amenities. Funding was identified in FY 2018, with only a small portion of the funds being spent.
3. Loftin Park Improvements - \$170,000 to be used for trees, irrigation, and fencing improvements.
4. Playgrounds, Shade Structures, and Park Amenities - \$100,000 to be used for replacement or purchase of playground structures, shade structures, and other park amenities as identified in the Parks Master Plan.
5. Decorative Standards for Streetlights Pilot Project (Newcastle Trail Lighting) - \$75,000 was identified in FY 2018, and an additional \$75,000 is shown in FY 2019 for trail light improvements. Lighting would improve both consistency with the Parks Master Plan and overall safety for trail users.

On behalf of the Parks and Recreation Advisory Board, we thank you for considering our recommendations on the parks related Capital Improvement Projects.



Sharon Veldman
 Chair
 Parks and Recreation Advisory Board

Attachment: PRAB Memo - Signed (2522 : CIP)

Draft 5 Year Capital Improvement Program Recommendations

Recommendations based on Flood Hazard Mitigation Report prepared by ARKK Engineers, LLC (March 2018)

Existing Projects

Description	FY 2017	FY 2018	FY 2019 Planned	FY 2020 Planned	FY 2021 Planned	FY 2022 Planned	FY 2023 Planned
Bonds for Better Bellaire Projects	Design and construction activity	Design and construction activity	Construction activity				

Flood Hazard Task Force Recommended Projects - Part of Bonds for Better Bellaire 2019

2019 Bond Program (Bonds for Better Bellaire 2019)				Design and construction activity	Design and construction activity	Design and construction activity	
Waste Water Treatment Plant Relocation - Evaluate the conversion of Bellaire's Wastewater Treatment Plant (WWTP), the dog park and soccer fields along Edith to detention areas.			Notice of Intent (NOI) Submittal				
Transfer WWTP to City of Houston - Evaluate the transfer of Wastewater Treatment for the City of Bellaire to the City of Houston Facility, including hazard mitigation funding opportunities.			Notice of Intent (NOI) Submittal				
100 year Detention Program - Continue to implement the 100-year detention program and requirements that are currently in place.	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing

Flood Hazard Task Force Recommended Projects - Non-Bond Cash

North / South Drainage Systems and Cypress Ditch - Determine partners, study alternatives, and develop cost estimates for improvements to increase capacity of the north/south drainage systems and Cypress Ditch.			Study and plan funding mechanism once cost estimates are developed				
Sheet Flow Barrier Removal - Identify barriers restricting sheet flow and determine what project could relieve this problem.			Study and plan funding mechanism once cost estimates are developed				
Kilmarnock Ditch - Coordinate with HCFCD to determine steps necessary to increase the size of the outfall of Kilmarnock Ditch. Construct extreme event outfalls at Bellaire Blvd and within the Southdale Subdivision to Kilmarnock Ditch.			Study and plan funding mechanism once cost estimates are developed				

DRAFT ACTION/MATRIX ORGANIZATION

Preventative Activities

1. Activity – Matrix Line Item 31 (Storms > 100 yr)
Establish a desired level of protection versus the cost to implement (cost benefit analysis).
2. Activity – Matrix Line Item 4 (Public Communication)
Develop an educational program/campaign warning residents of dangers of blocked storm sewers, and how they can help mitigate this problem.
3. Activity – Matrix Line Item 19 (Infrastructure (COB & Others))
Develop plan to inform residents of the importance of not filling in the floodplain.
4. Activity – Matrix Line Item 21 (Infrastructure (COB & Others))
Establish a comprehensive asset management plan allowing for better short and long-term planning of maintenance and capital improvement costs and needs.

Floodplain Management Regulatory Activities (Current and Future)

1. Activity – Matrix Line Item 27 (Economic Impact)
Ensure adequate City resources are in place to assist residents when applying for buy-out and elevation grants.
2. Activity – Matrix Line Item 27 (Economic Impact)
Develop Bellaire specific commercial drainage requirements.
3. Activity – Matrix Line Item 27 (Economic Impact)
At all stages of infrastructure project development in the floodplain, gather community input strategies to be examined; allowing the public to see the results, costs, and benefits for alternatives studied.
4. Activity – Matrix Line Item 27 (Economic Impact)
Evaluate a buy-out program for properties that have flooded repeatedly.
5. Activity – Matrix Line Item 28 (Economic Impact)
Update City Ordinances to clearly define development guidelines for structures in the designated flood areas, as defined by current Special Hazard Flood Area Maps. Review and update City Codes based on the recommended changes to the Special Flood Hazard Area Maps.
6. Activity – Matrix Line Item 29 (Economic Impact)
Research and evaluate regional approach to the 50% rule, for the development of City of Bellaire guidelines.

Property Protection Activities

1. **Activity – Matrix Line Item 27 (Economic Impact)**

Evaluate updates to the Building Code which would allow residents to take proactive mitigation efforts on their property.

Emergency Service Activities

1. **Activity – Matrix Line Item 9 (Mobility)**

Develop a plan to identify, utilize, and position non-conventional access vehicles for use when weather events dictate.

2. **Activity – Matrix Line Item 10 (Mobility)**

Properly budget for rescue oriented persons to make logical purchases for rescue equipment. Develop a program to identify, train, and utilize Citizen Rescuers and create MOU (cover liability of the asses use donation). Evaluate reinstating Citizen Emergency Response Team (CERT).

3. **Activity – Matrix Line Item 11 (Mobility)**

Research, develop scope and policies and procedures, and place into effect a mass notification system.

4. **Activity – Matrix Line Item 12 (Mobility)**

Develop a rescue plan which utilizes field-confirmed data to generate on-the-fly response maps for rescuer pathways.

5. **Activity – Matrix Line Item 8 (Mobility)**

Formalize a mechanism within the scope of EOC operations whereby a team would be responsible for field reconnaissance as well as publication of information for use by the public via the website, social media, local news media, etc.

Structural Projects

1. **Activity – Matrix Line Item 20 (Infrastructure (COB & Others))**

Coordinate with Harris County Flood Control District (HCFCD) and the U.S. Army Corps of Engineers to determine how additional widening of Brays Bayou will reduce flooding for the City of Bellaire.

2. **Activity – Matrix Line Items 14 & 16 (Infrastructure (COB & Others))**

Evaluate increasing the size of existing storm water drainage culverts in Bellaire while continuing to utilize drainage impact when selecting roads to be reconstructed. Lower street level when streets are under construction. Strategically locate undergoing storage pipes within the existing street right-of-way to store 100-year localized rainfall events.

3. **Activity – Matrix Line Item 17 (Infrastructure (COB & Others))**

Determine partners, study alternatives, and develop cost estimates for improvements to increase capacity of the north/south drainage systems and Cypress Ditch.

4. Activity – Matrix Line Item 13 (Infrastructure (COB & Others))
Include design and installation of backflow prevention systems in the upcoming Bonds for Better Bellaire 2016 Projects. Coordinate with neighboring agencies (i.e. TxDOT, City of Houston, and HCFCD) to prevent backflow storm water from entering the City's underground drainage systems.
5. Activity – Matrix Line Item 32 (Representation)
Identify any and all regional partnership opportunities (elected & appointed). Determine appropriate representatives from the City for regional agencies.
6. Activity - Matrix Line Item 19 (Infrastructure (COB & Others))
Identify barriers restricting sheet flow and determine what project could relieve this problem.
7. Activity – Matrix Line Item 18 (Infrastructure (COB & Others))
Create a proactive approach to repair and maintain drainage systems in desirable development areas and neighborhoods with storm drainage systems. Develop a schedule to perform routine maintenance, inspections, and repairs to storm water infrastructure. Expedite a plan to repair and replace the highly critical local drainage systems in the current Cond for Better Bellaire 2016. Re-evaluate the priorities annually and aggressively pursue future bond programs.
8. Activity – Matrix Line Item 20 (Infrastructure (COB & Others))
Coordinate with HCFCD to determine steps necessary to increase the size of the outfall of Kilmarnock Ditch. Construct extreme event outfalls at Bellaire Blvd and within the Southdale Subdivision to Kilmarnock Ditch.
9. Activity – Matrix Line Item 22 (Infrastructure (COB & Others))
Contact surrounding municipalities and the agencies that own the storm sewers to consider upgrading their storm sewer and providing more detention. Investigate City of Houston developments north of Bellaire for total runoff.
10. Activity – Matrix Line Items 15 & 16 (Infrastructure (COB & Others))
Evaluate the conversion of Bellaire's Wastewater Treatment Plant and the dog park and soccer fields along Edith into detentions areas. Evaluate the conversion of the trash transfer station at Beltway 8 to a reservoir for Brays Bayou.
11. Activity – Matrix Line Item 15 (Infrastructure (COB & Others))
Evaluate the feasibility of adding flood stage gauges at strategic locations in the City to provide flood water readings for public safety.
12. Activity – Matrix Line Item 24 (Facilities and Equipment)
Evaluate the transfer of Wastewater Treatment for the City of Bellaire to the City of Houston Facility, including hazard mitigation funding opportunities.

Public Information Activities

1. **Activity – Matrix Line Item 1 (Public Communication)**
Develop a marketing plan which identifies the City outlets and how to increase participation in them. The plan should list events, stakeholders, etc. Develop and update a list of frequently utilized non-City outlets which the City should use to distribute its messages. This list should include media contacts, etc.
2. **Activity – Matrix Line Item 2 (Public Communication)**
Pre-populate communication outlets which needed information, allowing conacts to “opt-out”, instead of having to “opt-in”. Develop a communication matrix to outline what messages should be sent through which outlets. Evaluate the implementation of a “local street warden” program to deliver City produced storm related communication to their assigned area.
3. **Activity – Matrix Line Item 2 (Public Communication)**
Evaluate the implementation of a “local street warden” program to deliver City produced storm related communication to their assigned area.
4. **Activity – Matrix Line Item 3 (Public Communication)**
Develop public messages to be used prior to and during an event to outline when residents should use 911. The public messages should also include other communication outlets residents can utilized in non-emergency situations.
5. **Activity – Matrix Line Item 4 (Public Communication)**
Develop an educational program/campaign to inform residents and stakeholders of regularly utilized communication outlets.
6. **Activity – Matrix Line Item 5, 6 & 7 (Public Communication)**
Develop a communication template to be utilized prior to, during and after a flooding even which includes updates on information the City has deemed important based on lessons learned from previous events.
7. **Activity – Matrix Line Item 23 (Preparedness)**
Utilize Town Hall meetings to discuss all hazard preparedness. Create a preparedness milestone for families.
8. **Activity – Matrix Line Items 18 & 31 (Infrastructure (COB & Others)& Storm > 100yr)**
Develop an education program/campaign to inform residents on the level of protection provided by the City’s infrastructure. Educate the public that street flooding is preferable to structural flooding.
9. **Activity – Matrix Line Item 25 (Health & Safety)**
Periodically distribute messages to residents warning of dangers of walking or playing in floodwaters. Everyone should refrain from walking or riding bicycles in floodwaters. Develop a plan with local schools to educate children to avoid walking, playing, or riding bicycles in floodwaters.

	Assessment/History	Risk/Issues	Mitigation Options/Goal	Action/Implementation Plan
Hazard Category	The assessment and history is the background information which is being used to determine the hazard and severity. This tells us why a particular hazard is relevant in today's environment.	Risks are the individual situations that are created as a result of the hazard.	The Mitigation Plan should develop a strategy for reducing the potential losses identified in the risk assessment, and include goals and objectives.	The Action Plan should provide tangible solutions for achieving the goals and objectives outlined in the Mitigation Plan.
Public Communication	1 Previous events have shown that good communication prior to, during, and after an event can reduce the amount of damage to property and individuals. - Not sufficiently marketing the outlets utilized by the City can limit the reach of the City's messages. - Not providing City messages to outside outlets, can limit their range and effectiveness.	Residents Utilizing Non-City of Bellaire Outlets to Obtain Information	Outlets should be marketed to stakeholders throughout the year Non-City of Bellaire Outlets Should be Utilized to Distribute Information	Develop a marketing plan which identifies the City outlets and how to increase participation in them. The plan should list events, stakeholders, etc. Develop and update a list of frequently utilized non-City outlets which the City should use to distribute its messages. This list should include media contacts, etc. (Target Completion: End of FY 2019)
	2 Previous events have shown that good communication prior to, during, and after an event can reduce the amount of damage to property and individuals. - Not ensuring each communication outlet is being utilized can lead to an information vacuum, where some residents may not receive essential information.	Communication Efforts Not Reaching Audience	All outlets available should be utilized by the City	Pre-populate communication outlets with needed information, allowing contacts to "opt-out", instead of having to "opt-in". Develop a communication matrix to outline what messages should be sent through which outlets. Evaluate the implementation of a "local street warden" program to deliver City produced storm related communication to their assigned area. (Target Completion: End of FY 2019)
	3 History has shown that at the height of a significant event, emergency communication can be diminished resulting in longer wait times or a requirement to queue 911 callers.	Diminished Emergency Communication (911) Capacity	Ensure residents are aware of when to call 911 (what constitutes an emergency) Provide redundancies in 911 communication operations	Develop public messages to be used prior to and during an event to outline when residents should use 911. The public messages should also include other communications outlets residents can utilize in non-emergency situations. (Target Completion: End of FY 2019)
	4 During major events access to common communications devices may be unavailable, which impacts the city's ability to regularly update residents.	Failure/Lack of Common Communication Outlets	All outlets available should be utilized by the City	Develop an educational program/campaign to inform residents and stakeholders of regularly utilized communication outlets. (Target Completion: End of FY 2019)

Attachment: Hazard-Risk Assessment Matrix 3.15.18 (2522 : CIP)

	Assessment/History	Risk/Issues	Mitigation Options/Goal	Action/Implementation Plan
5	<p>Previous events have shown that good communication prior to, during, and after an event can reduce the amount of damage to property and individuals.</p> <p>- A lack of communication prior to a flooding event can leave residents unprepared for the possible impact of an event.</p> <p>- Additionally, poor communication can cause confusion or misinformation which could become an issue during an event.</p>	Lack of Pre-Event Communication	Provide regular up-to-date information through each of the City's communication outlets to residents, employees, and community stakeholders	<p>Develop a communication template to be utilized prior to an event which includes updates on information the City's has determined is important based on lessons learned from previous events.</p> <p>(Target Completion: End of FY 2019)</p>
6	<p>Previous events have shown that good communication prior to, during, and after an event can reduce the amount of damage to property and individuals.</p> <p>- A lack of communication during an event can lead to confusion and hinder decisions needing to be made by residents.</p>	Lack of Communication During an Event	Up-to-date information should continuously be distributed during an event utilizing all outlets available to the City	<p>Develop a communication template to be utilized during an event which includes updates on information the City has determined is important based on lessons learned from previous events.</p> <p>(Target Completion: End of FY 2019)</p>
7	<p>Previous events have shown that good communication prior to, during, and after an event can reduce the amount of damage to property and individuals.</p> <p>- After an event; residents, employees, business, and numerous other community stakeholders need to have proper information to understand how they and the City are moving forward, post event.</p>	Lack of Post-Event Communication	Provide regular up-to-date information through each of the City's communication outlets to residents, employees, and community stakeholders	<p>Develop a communication template to be utilized after an event which includes updates on information the City's has determined is important based on lessons learned from previous events.</p> <p>(Target Completion: End of FY 2019)</p>
8	<p>Drainage systems, including those in Bellaire rely on the street infrastructure for detention during high intensity rain events. Because drainage capacity is difficult to come by it is unlikely that this will ever change. To that end during high intensity rain events, some City of Bellaire streets will hold water for varying periods of time.</p>	Reduced mobility can increase emergency response times	Provide regular up-to-date information on local road conditions	<p>Formalize a mechanism within the scope of EOC operations whereby a team would be responsible for field reconnaissance as well as publication of information for use by the public via the website, social media, local news media, etc.</p> <p>(Target Completion: End of FY 2019)</p>
9	<p>Drainage systems, including those in Bellaire rely on the street infrastructure for detention during high intensity rain events. Because drainage capacity is difficult to come by it is unlikely that this will ever change. To that end during high intensity rain events, some City of Bellaire streets will hold water for varying periods of time.</p> <p>- Historic flooding events create impassable roadways where vehicle mobility is limited due to high water areas.</p>	Bellaire's Public Safety Components will not be able to respond with "normal" first response equipment	Utilize non-conventional vehicles for response	<p>Develop a plan to identify, utilize, and position non-conventional access vehicles for use when weather events dictate.</p> <p>(Target Completion: End of FY 2019)</p>

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	Assessment/History	Risk/Issues	Mitigation Options/Goal	Action/Implementation Plan
10 Mobility	<p>Drainage systems, including those in Bellaire rely on the street infrastructure for detention during high intensity rain events. Because drainage capacity is difficult to come by it is unlikely that this will ever change. To that end during high intensity rain events, some City of Bellaire streets will hold water for varying periods of time.</p> <p>- Extreme flood events make overland mobility impossible</p>	Inability to rescue persons trapped in home, where flood inundation makes continued occupation life threatening. More persons calling for rescue than Bellaire has ability to respond	<p>Utilize a multi departmental approach to rescue which includes training and equipping to help solve issue</p> <p>Utilize Citizen Responders (boat owners & high water vehicles), and mobilize this group as a force multiplier in flood emergencies</p>	<p>Ensure adequate funding to send rescue oriented persons to hazard specific schools to for information to make logical purchases for rescue equipment (i.e. boats, dry suits, helmets, Coast Guard approved rescue Personal Flotation Devices for flood response).</p> <p>Develop a program to identify, train, and utilize Citizen Rescuers and create a Memorandum of Understanding (cover liability of the asset use donation).</p> <p>(Target Completion: End of FY 2019)</p>
	<p>Drainage systems, including those in Bellaire rely on the street infrastructure for detention during high intensity rain events. Because drainage capacity is difficult to come by it is unlikely that this will ever change. To that end during high intensity rain events, some City of Bellaire streets will hold water for varying periods of time.</p> <p>- Extreme flood events make overland mobility impossible</p>	Inability to rescue persons trapped in homes, where flood inundation makes continued occupation life threatening	Utilize a mass notification system that will reach all residents with relevant hazard warning and evacuation advice	<p>Research, develop scope and policies & procedures for and place into affect a Mass Notification System.</p> <p>(Target Completion: End of FY 2019)</p>
	Flood events hinder mobility due to flooding of Bellaire streets	Specialized response vehicles will not be able to reach all residents (water too high for truck, water too low for boat) and move to safe haven	Evacuate rescued persons from deep water inundation, to shallow water vehicle access area, to area of relative safety, to eventual shelter	<p>Develop a rescue plan which utilizes field-confirmed data to generate on-the-fly response maps for rescue pathways.</p> <p>(Target Completion: End of FY 2019)</p>
	Storm water from Brays Bayou and Cypress Ditch can backflow into the City's underground drainage system. Backflow from Brays Bayou and Cypress Ditch reduces the capacity in the City's underground system.	Storm water that has backflowed into the City's system results in less capacity for local rainfall events resulting in flooding	Utilize backflow devices to prevent storm water from the bayou, during high water surface conditions, from coming back into the City's underground system	<p>Include design and installation of backflow prevention systems in future projects for Bonds for Better Bellaire 2016.</p> <p>Coordinate with neighboring agencies (i.e. TxDOT, City of Houston and HCFCD) to prevent backflow stormwater from entering the City's underground drainage systems.</p> <p>(First Phase Completion: End of FY 2020)</p>

	Assessment/History	Risk/Issues	Mitigation Options/Goal	Action/Implementation Plan
14	Overland sheet flow from areas inside and outside the City collects in low lying areas that do not have adequate storm drainage systems or positive overland flow capabilities to prevent flooding.	Overland sheet flow causes flooding in low lying areas	Lower the height of the floodwaters during a localized 100-year storm event in areas where overland flow problems exist	<p>Strategically locate underground storage pipes within the existing street right-of-way to store 100-year localized rainfall events.</p> <p>(Target Completion: End of FY 2020)</p> <p>Evaluate increasing the size of existing stormwater drainage culverts in Bellaire.</p> <p>(Target Completion: End of FY 2020)</p> <p>Continue to utilize drainage impact when selecting roads to be rebuilt.</p>
15	Inadequate capacity in Brays Bayou has resulted in a cooperative effort between HCFCD and the U.S. Army Corps of Engineers to widen Brays Bayou to substantially reduce flooding risks in the Brays Bayou watershed.	Brays Bayou is undersized for extreme rain events and flood stages prevent local Bellaire drainage systems from adequately serving the area	<p>Determine if additional improvements to Brays Bayou are possible beyond Project Brays to further increase capacity</p> <p>Provide more flood-hardened rain and flood stage gauges for better flood forecasting</p>	<p>Coordinate with HCFCD and the U.S. Army Corps of Engineers to determine how additional widening of Brays Bayou will reduce flooding for the City of Bellaire.</p> <p>(Target Completion: End of FY 2021)</p> <p>Evaluate the feasibility of adding more flood-hardened flood stage gauges at strategic locations in the City, to provide for public safety.</p> <p>(Target Completion: End of FY 2019)</p> <p>Evaluate the conversion of the trash transfer station at Beltway 8 to a reservoir for Brays Bayou.</p> <p>(Target Completion: End of FY 2019)</p>

Attachment: Hazard-Risk Assessment Matrix 3.15.18 (2522 : CIP)

	Assessment/History	Risk/Issues	Mitigation Options/Goal	Action/Implementation Plan
16 17 18 Infrastructure (COB & Other)	Water overflow from the Brays Bayou is a single significant factor for the wide spread flooding in Bellaire and surrounding areas. The water level at the peak was 4 Ft above the bank on Sunday August 27th 2017.	It flooded many houses South of Bellaire Blvd. Majority of these houses were flooded first time	Move remaining areas (Post Oak Terrace and Southdale) out of 100 year floor plain even after the completion of the project Brays Reduce or prevent wide spread damage in the events that are as significant as Harvey (beyond 100 year events)	Evaluate the conversion of Bellaire's Wastewater Treatment Plat to a retention area Evaluate the conversion of the dog park and soccer fields along Edith into a detention area. Lower street level when streets are under construction (Target Completion: End of FY 2019)
	Major North/South drainage systems and Cypress Ditch are undersized for the large drainage area.	Inability to convey storm water adequately to Brays Bayou, therefore creating additional flooding risks.	Increase capacity of the North/South drainage systems and the Cypress Ditch	Study alternatives and develop cost estimates for improvements. Determine partners. (Target Completion: End of FY 2019)
	Streets/Roadways are designed to store floodwaters that have overwhelmed the underground storm storage system to mitigate structural flooding.	Street Flooding	Increase street storm water storage to reduce structural flooding. Assess the advantages and disadvantages of street flooding vs. structural flooding	Educate and inform the public that street flooding is preferable to structural flooding. (Target Completion: End of FY 2019) Expedite a plan to repair and replace the highly critica local drainage systems in the current Bonds for Better Bellaire 2016. Re-evaluate the priorities annually. Aggressively pursue future bond programs. (Target Completion: End of FY 2020) Develop a schedule to perform routine maintenance, inspections, and repairs to all storm water infrastructure (such as pipes, or open waterway) on a minimum 5-year cycle. (Target Completion: End of FY 2019) Create a proactive approach to repair and maintain drainage systems in desirable development areas and neighborhoods with storm drainage systems. (Target Completion: End of FY 2019)

Attachment: Hazard-Risk Assessment Matrix 3.15.18 (2522 : CIP)

	Assessment/History	Risk/Issues	Mitigation Options/Goal	Action/Implementation Plan
19	Bellaire is in a flat coastal area with predominately clay soils that are relatively impervious. Additionally, existing elevations and roadway patterns create barriers that trap sheet flow. Flooding occurs more frequently in areas with these conditions.	Existing topography, soils and roadway patterns contribute to flooding. These conditions and barriers trap sheet flow generated by extreme rain events and make flooding worse	Reduce barriers to flow of flood waters Educate residents on the local topography and why it exacerbates flooding	Identify barriers restricting sheet flow and determine what projects could relieve this problem. (Target Completion: End of FY 2019) Develop communication plan to inform residents of the importance of not filling in the floodplain. (Target Completion: End of FY 2019)
20	Outfall of Kilmarnock Ditch has proven to be undersized. The undersized outfall causes a backup of floodwaters to the upstream areas and contributes to localized flooding.	Outfall of Kilmarnock Ditch is undersized	Increasing the size of the outfall of Kilmarnock Ditch	Coordinate with HCFCD to determine steps necessary to increase the size of the outfall of Kilmarnock Ditch. Construct extreme event outfalls at Bellaire Blvd and within the Southdale Subdivision to Kilmarnock Ditch. (Target Completion: End of FY 2023)
21	Debris can clog inlets and storm sewers. This exacerbates localized flooding, since floodwaters cannot drain away quickly.	Blockage of inlets and drainage systems by debris make flooding more severe	Maintain the storm sewer system so that it is free from blockages and operates at its peak efficiency Ensure adequate staffing to maintain storm sewer system	Develop an educational program/campaign warning residents of the dangers of blocked storm sewers, and how they can help mitigate this problem. (Target Completion: End of FY 2019) Establish a comprehensive asset management plan allowing for better short and long-term planning of maintenance and capital improvement costs and needs. (Target Completion: End of FY 2019)
22	Storm sewers and overland sheet flow from outside the City flow into the City and contribute to flooding.	Drainage from outside the City	Reduce peak flows of storm water into the City from external storm sewers Eliminate the water Net surplus in Bellaire	Contact surrounding municipalities and the agencies that own the storm sewers to consider upgrading their storm sewer system and providing more detention. Investigate City of Houston developments north of Bellaire for total runoff. (Target Completion: End of FY 2019)

Attachment: Hazard-Risk Assessment Matrix 3.15.18 (2522 : CIP)

		Assessment/History	Risk/Issues	Mitigation Options/Goal	Action/Implementation Plan
23	Preparedness	Bellaire is situated in a portion of the country that receives large storm systems and produces and transports hazardous chemicals	Residents will not be adequately prepared for natural and man made disasters	Community outreach to increase preparedness awareness	Utilize Town Hall meetings to discuss all-hazard preparedness. Create a preparedness milestone for families. Evaluate reinstating Citizen Emergency Response Team (CERT) (Target Completion: End of FY 2019)
	Facilities & Equipment	The Public Works Department is located in the south eastern most portion of the City. To that end, it is among the first to experience flooding from a highwater event on Brays. To limit future damage is challenging. Further the wastewater treatment facility is located in this area as well and serves all Bellaire residents.	Repetitive loss of equipment and or loss of wastewater services to the community	Sell or close the WWTP and contract with Houston for service Relocate PW facility out of the flood zone	Evaluate the transfer of Wastewater Treatment for the City of Bellaire to the City of Houston facility, including utilizing hazard mitigation funding opportunities. (Target Completion: End of FY 2023)
25	Health & Safety	Floodwaters may conceal hidden objects that could cause injury. Residents can inadvertently step into manholes or inlets that have lost their lids. Floodwaters carry dangerous diseases that can make people ill due to overflowing sanitary sewers. Snakes and ants can be found floating in floodwaters.	Danger to people walking, playing, or riding bicycles in floodwaters	Prevent injuries to residents due to walking, playing, or riding bicycles in floodwaters Prevent infiltration into the sanitary sewer so that overflows and contamination of floodwaters will be reduced	Periodically distribute messages to residents warning of dangers of walking or playing in floodwaters. Everyone should refrain from walking or riding bicycles in floodwaters. Develop a plan with local schools to educate children to avoid walking, playing, or riding bicycles in floodwaters. (Target Completion: End of FY 2019)
		According to the Harris County Health Department, waters associated with flooding carry numerous ground contaminants such as pesticide, hydrocarbons, and herbicides, as well as household chemicals. Flood water also displace rodents, ants and spiders.	Persons, including rescuers, will come in contact with pests and chemicals that may create health hazard	Ensure rescuers have proper Personal Protective Equipment specific to the hazard	Properly budget for rescue oriented persons to make logical purchases for rescue equipment. (Target Completion: End of FY 2019)
26					

Assessment/History		Risk/Issues	Mitigation Options/Goal	Action/Implementation Plan
27	Single family housing is the primary economic factor for the City. The current codes and ordinances adopted have increased the life cycle for compliant structures. Additionally, a lack of established guidelines, and how they affect non-compliant structures, has led to a negative public perception of the housing stock after significant flood events.	Negative public perception of housing stock	Disclosure of Flooding/Flood Variance History Reduce Number of Unsafe Structures in the City Seek community input on development in the floodplain	Ensure adequate City resources are in place to assist residents when applying for buy out and elevation grants. Evaluate updates to the Building Code which would allow residents to take proactive mitigation efforts on their property. Develop Bellaire specific commercial drainage requirements. (Target Completion: End of FY 2023) At all stages of infrastructure project development in the flood plain, gather community input strategies to be examined; allowing the public to see the results, costs, and benefits for alternatives studied. <

Economic Impact

Attachment: Hazard-Risk Assessment Matrix 3.15.18 (2522 : CIP)

	Assessment/History	Risk/Issues	Mitigation Options/Goal	Action/Implementation Plan
28	The frequency of significant rain events in the past three years has called to question the accuracy of the Base Flood Elevations as a predictor of flood risk. Past events, such as Tropical Storm Allison, have led to updates to the local Special Hazard Flood Area maps. The revision of these maps is not the responsibility of the city of Bellaire. It has historically taken 5 to 7 years to implement recommended map revisions.	Uncertain Base Flood elevations in AE and non-AE zones (100 yr. zones)	Provide clear guidelines for development and redevelopment for non-compliant structures	Update City Ordinances to clearly define development guidelines for structures in the designated flood areas as defined by current Special Hazard Flood Area Maps Review and Update City Codes based on the recommended changes to the Special Flood Hazard Area Maps. (Target Completion: End of FY 2019)
29	As a participant in the National Flood Insurance Program (NFIP), the City of Bellaire follows the 50% Rule to determine substantial damage. Currently the City only applies previous flood repairs to this rule. As a result, future flood repairs can be limited by previous repairs.	A drop in demand for Bellaire homes, compared to the surrounding area, will lead to lower home values, lower tax revenues, and an overall deteriorated community	Adjust the Community Rating System (CRS) to a cumulative approach to the 50% rule using previous flood events within a 10 year timeframe/look back. A local adherence to a stance consistent with the rest of the metro area will eliminate market value deterioration	Update the cumulative rule to flood related damage sustained by a structure only after two (2) separate flood occasions excluding non-flood related permits. (Target Completion: FY 2019)
30	Structures which have historically never flooded are being impacted by flooding events. This has led property owners to evaluate taking extreme mitigation action to limit the impact of future events.	Elevation of new and existing structures improperly meeting future COB codes	Ensure compliance with BFE's are sufficient for known flooding risk	Continue with the already existing regulatory activities and make changes accordingly as additional data is collected.
31	Many of the mitigation efforts in place hinge on regional projects currently in the works or projected. The city will still be subject to some amount of flooding, therefore even when regional projects are completed the impact of a 500 year event still exists.	False sense of City protection levels	Educate public of flooding risks Continue to enforce development/redevelopment standards	Develop an education program/campaign to inform residents on the level of protection provided by the City's infrastructure. (Target Completion: End of FY 2019) Establish a desired level of protection versus the cost to implement (cost benefit analysis). (Target Completion: End of FY 2020)
32	The city may not have proper representation within regional agencies or constituents. This could impact the amount of funding or what projects are funded that could have the greatest amount of impact on our mitigation efforts. Currently it is not clear the exact need for representation on regional platforms or participation regional during the planning process.	Failure of regional partners to keep promises results in missed funding opportunities.	Ensure adequate representation to and relationships with regional partners	Identify any and all regional partnership opportunities (elected & appointed). Determine appropriate representatives from the City for regional agencies. (Target Completion: FY 2019)

Goals

Safety & Assurance

Planning & Implementation of Drainage Improvements

Floodplain Regulation & Management

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