AGENDA STATEMENT

City of Bellaire

MEETING: City Council - Oct 04 2021
PREPARED BY: Michael Leech
DEPARTMENT: Public Works

ITEM TITLE:

Presentation of the findings of the Master Drainage Concept Plan and discussion of potential next steps including cooperatively funded preliminary engineering, design and construction of projects through partnerships with the Harris County Flood Control District, the City of Houston, TxDOT and others - Submitted by Michael Leech, Director of Public Works.

RECOMMENDATION:

The Public Works Director recommends City Council review and provide direction regarding the findings of the Master Drainage Concept Plan. The report will focus on the results of the study and provides information pertaining to potential for next steps which include contracting for advisory services, preliminary engineering, design and construction through partnerships with the Harris County Flood Control, the City of Houston, TxDOT and others.

BACKGROUND/SUMMARY:

The purpose of this discussion is to receive City Council direction regarding the findings of the Master Drainage Concept Plan (MDCP). The purpose of the MDCP was to identify the reasons why Bellaire experiences flooding during rainfall events through hydraulic and hydrologic modeling and to use that information to develop concepts through which the flooding issues can be addressed. The modeling has been completed and three concepts were developed using the models as a guide. The third concept, Concept C has been found to be the best option to pursue.

Concept C is the the least expensive of the three and also addresses the feedback provided by City Council as well feedback from the Flood Hazard Mitigation Task Force (FHMTF) received at a prior FHMTF meeting. This feedback is summarized as follows:

1. Benefit most impacted areas (Southdale) with focus on Cypress Ditch
2. Project should be scalable with benefit realized in each phase
3. There will be no acquisition of private Bellaire lots

Please bear in mind that concept C as described in the MDCP is not a design or even a preliminary engineering report. Preliminary engineering as well as design are necessary next steps in this process. It is likely that when improvements are ultimately designed and constructed that they will reflect the concept, but it is also likely that there will be changes. Changes could result from things ranging in complexity from the location of existing utilities to policy changes on storm water detention or storage

locations within CenterPoint or Union Pacific Railroad rights of way. We also expect future refinements of and ongoing public discussions regarding the MDCP.

Plans for partnering with other agencies including, Harris County Flood Control District (HCFCD), The Texas Department of Transportation,(TxDOT), the City of Houston (COH) and others will be a key component of this discussion as well.

PREVIOUS COUNCIL ACTION:

December 17, 2018: City Council Meeting – MDCP progress update
February 4, 2018: State of the City - MDCP progress update
March 18, 2019: City Council authorization of City Manager to execute agreements with HCFCD and TxDOT
November 19, 2019: City Council approval of MDCP Contract with ARKK, Freese Nichols, Costello
September 1, 2020: Preliminary findings and review of options with FHMT
July 16, 2021: City Council Friday memo.

FISCAL IMPACT:

The findings of this report have no initial fiscal impact. City Council approval will be required for any preliminary engineering, design or construction expenditures in the future.

CITY ATTORNEY REVIEW:

☐ **Yes** ☑ **No**

Master Drainage Concept Plan Results and Next Steps

PUBLIC WORKS DEPARTMENT

Overview

1. Project Background
2. Findings and Results
3. Funding and Partnership Opportunities
4. Flood Hazard Mitigation Taskforce Meeting Summary
5. Next Steps

Project Background

Cooperative study of regional drainage issues (~$750k)

- Financial Partners
  - Harris County (HCFCD) $351,000
  - Bellaire $221,750
  - TxDOT - $129,250
- Area Planning Partners
  - City of Houston
  - West University Place
  - Union Pacific Railroad
  - CenterPoint Energy

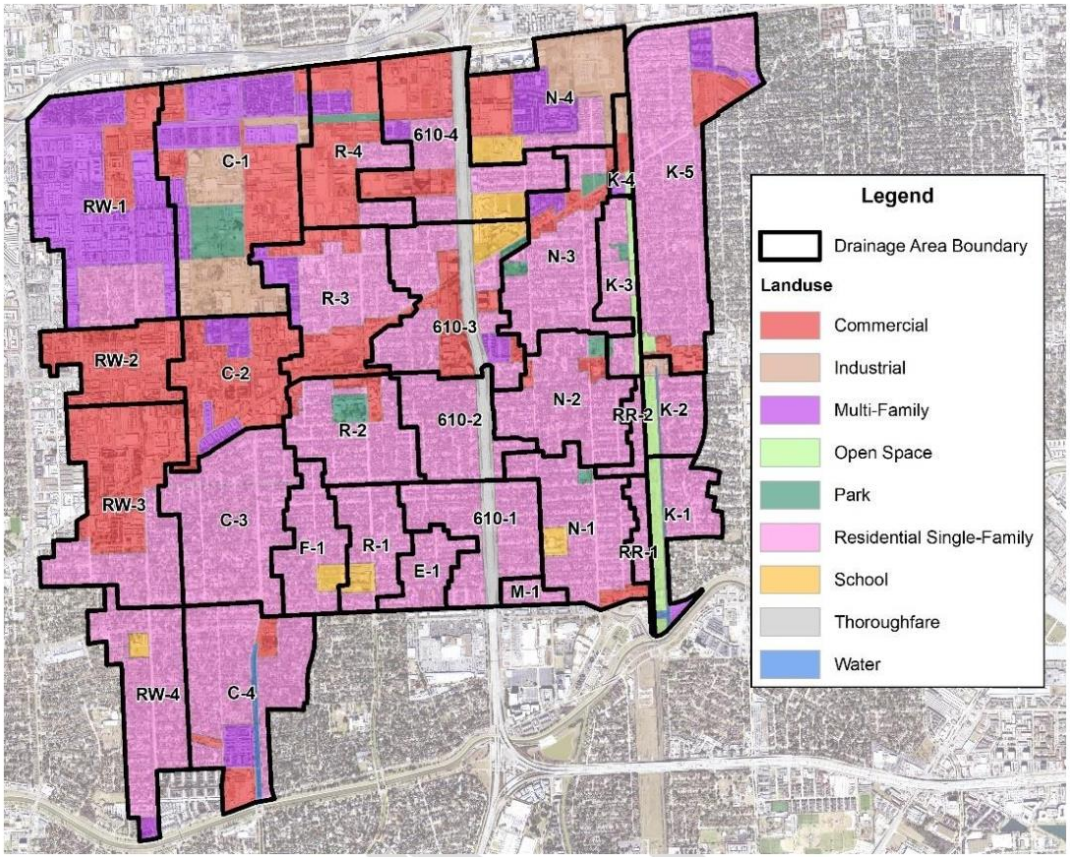
Need for study – model existing conditions under variety of storm conditions

Modeling is common language and scientifically identifies issues via standard methodologies

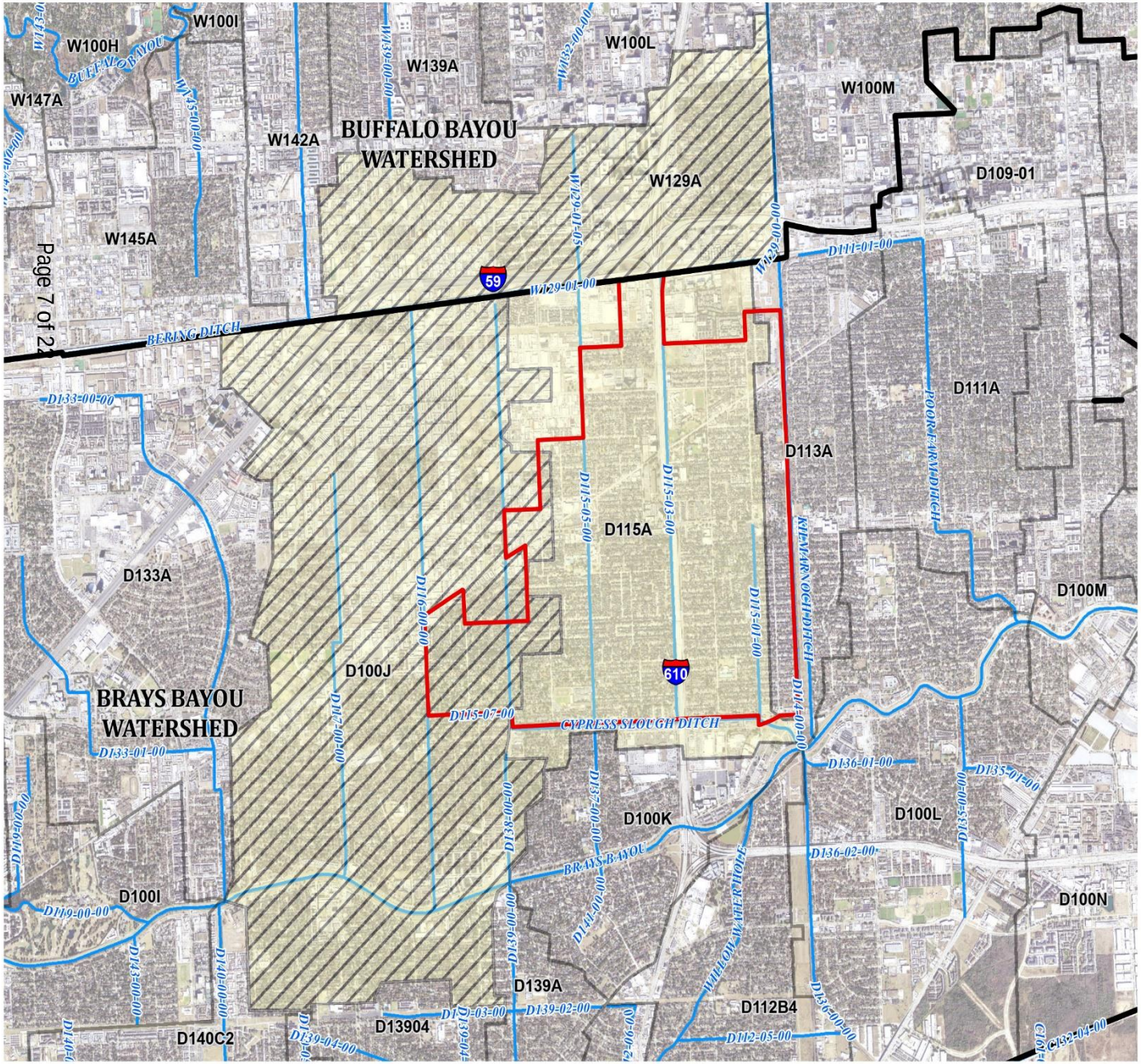
Modeling is critical in the identification of solutions

This is a planning tool needed to compete for funding (Federal, State, etc.)

Project Background



- Study area beyond Bellaire City Limits
- Purpose – Identify stormwater issues impacting Bellaire from outside the City limits
- Assess stormwater flow under certain storm event conditions from COH into Bellaire and into Brays Bayou



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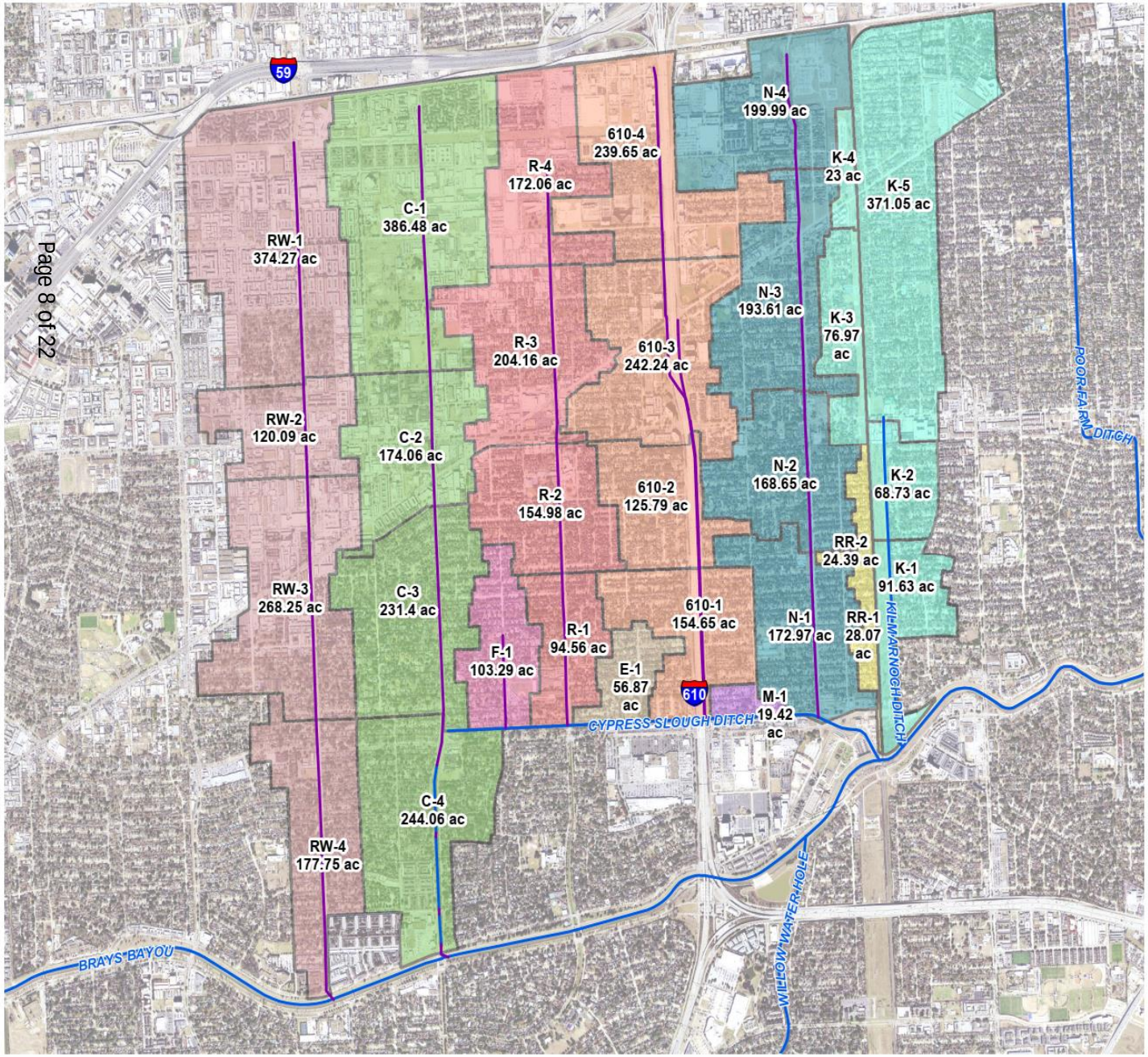
CITY OF BELLAIRE
MASTER DRAINAGE CONCEPT PLAN

WATERSHED MAP

JOB NO.: 2013219-001-DS-002	DATE: AUG 2021	BY: MTW

EXHIBIT 1



N

0 2,000

Feet

1 in = 2,000 ft

Legend

- Stream Centerline
- Storm Sewer Trunk Line

Drainage Area Boundary

- Chimney Rock
- Englewood
- Ferris
- I-610
- Kilmarnoch Ditch
- Mimosa
- Newcastle
- Union Pacific Railroad
- Renwick
- Rice

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CITY OF BELLAIRE
MASTER DRAINAGE CONCEPT PLAN

DRAINAGE AREA MAP

JOB NO.: 2013219-001-DS-002	DATE: AUG 2021	BY: MTW

EXHIBIT 3

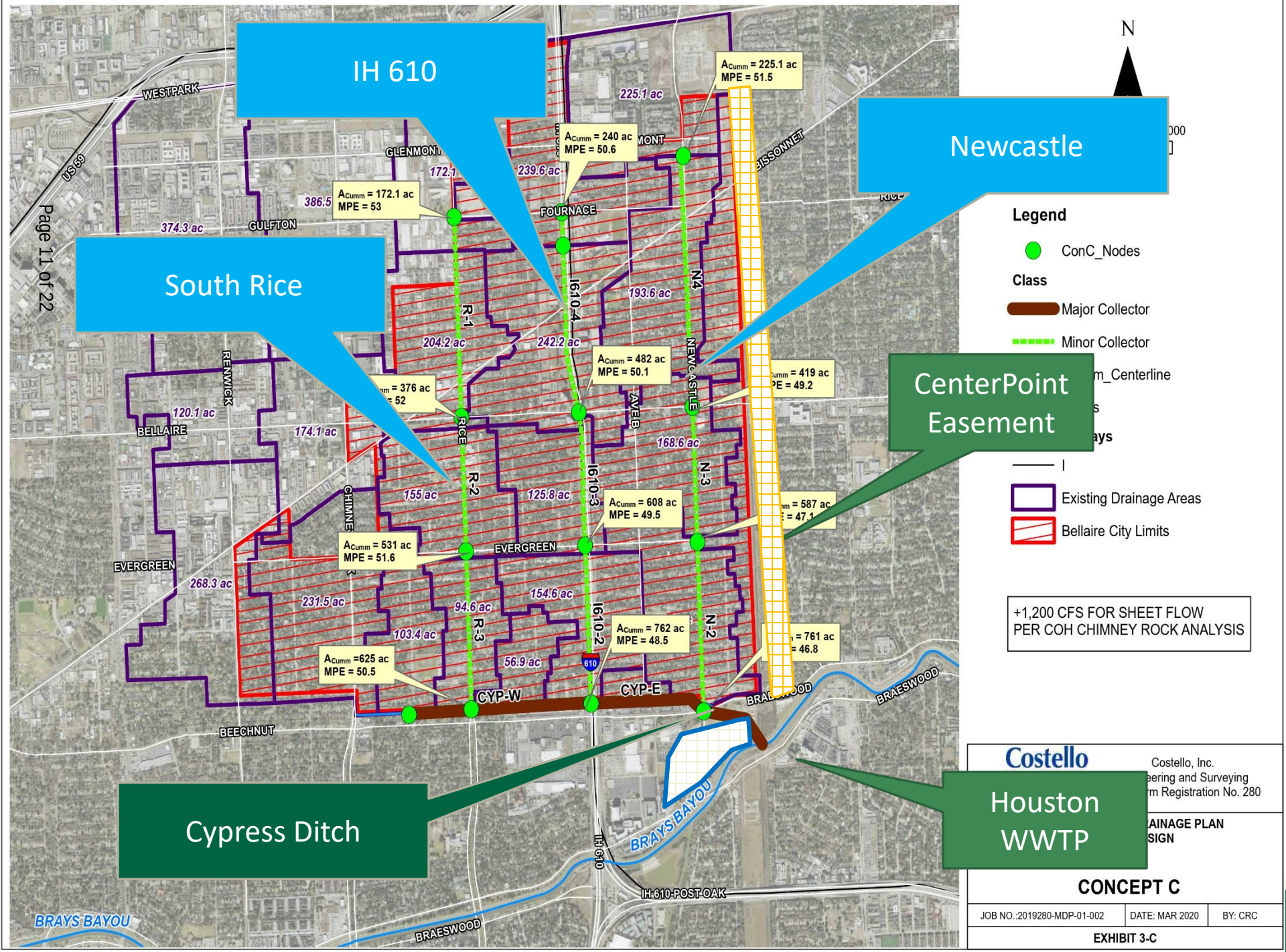
Finding and Results

Preliminary Findings

- The northern portions of Bellaire flood irrespective of Brays Bayou due to stormwater system inadequacies
- Improvements to the north-south stormwater conveyance facilities are needed to address these issues
- These needs will require a continuation of capital improvements for local streets and drainage to maximize benefit of MDCP
  - May continue to include drainage improvements to 100-year design standard
  - PCI results would be utilized to focus on opportunities where drainage and pavement needs align
- Recommendations will allow for opportunities to pursue projects with both an immediate and long-term, system-wide benefit
- Solutions will require exploration of strategic options for partnerships and approaches to funding solutions and project delivery options
  - Detention potentially available: COH -WWTP and CenterPoint Easement

Finding and Results

- Three Concepts solutions developed
  - Results of study indicate Concept "C" is best approach
- These are not designs, not preliminary engineering
  - Both will be required to move forward
- Cost estimates along with project scopes and phasing are preliminary and will be refined through PER and Design phases
- Concept **C** Incorporates Council and Flood Hazard Mitigation Taskforce input
  - Benefit Southdale and most impacted areas with focus on Cypress Ditch
  - Project should be scalable with benefit in each phase.
  - No acquisition of private lots



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AINAGE PLAN
SIGN

CONCEPT C

JOB NO.:2019280-MDP-01-002	DATE: MAR 2020	BY: CRC

EXHIBIT 3-C

Finding and Results
Concept "C"

- Lower cost projects with immediate benefit
- Identified Preliminary Phasing
  - 610 – TxDOT Improvements - $80.5 MM
    - Would provide most initial benefit
    - Most challenging portion due to funding and coordination challenges
  - Cypress Ditch - $35 MM
    - Funding opportunities (HCFD & COH) for Cypress Ditch
    - Cypress Ditch (D115) is **not** a COB facility
    - Not located within the city limits of Bellaire

Finding and Results
Concept "C"

- South Rice
  - Could be done with S. Rice future reconstruction – $76 MM
- Newcastle -
  - Storm sewer or traditional tunneling $59.7MM

    *Through PER alternative methods for tunnel system will be explored that could provide lower cost. $24MM - $59.7MM
- Actual approaches for design and construction are **not finalized**
  - To be refined based on priorities, available funding, partnership opportunities, and PER guidance

Partnership Opportunities

COH-HCFCD Cypress Ditch Improvements

Proposed Regional Interagency CDBG-MIT Projects
Harris County Flood Control District / Harris County / City of Houston
Revised 10/21/2019

Project Totals by Agency			
	Total	CDBG-MIT	Local
HCFCD	$ 784,100,000.00	$ 633,590,000.00	$ 150,510,000.00
HC	$ 277,858,000.00	$ 222,286,400.00	$ 55,571,600.00
COH	$ 2,089,191,073.00	$ 1,920,386,629.00	$ 168,804,444.00
Total	$ 3,151,149,073.00	$ 2,776,263,029.00	$ 374,886,044.00

Watershed	Total	Partner	Local
Brays Bayou	$ 1,381,775,590.00	$ 1,258,215,326.00	$ 123,560,264.00
Greens Bayou	$ 253,843,000.00	$ 209,684,400.00	$ 44,158,600.00
Halls Bayou	$ 541,389,756.00	$ 462,633,030.00	$ 78,756,726.00
Hunting Bayou	$ 192,496,747.00	$ 192,496,747.00	$ -
Sims Bayou	$ 561,364,599.00	$ 481,616,607.00	$ 79,747,992.00
White Oak Bayou	$ 220,279,381.00	$ 171,616,919.00	$ 48,662,462.00
Total	$ 3,151,149,073.00	$ 2,776,263,029.00	$ 374,886,044.00

Agency	ID	Watershed	Project Title	Political Jurisdiction	Total Cost	CDBG-MIT
COH	Brays Mid-Reach	Brays Bayou	Westbury Area		$ 275,679,362.00	$ 253,966,782.00
COH	Brays Mid-Reach	Brays Bayou	Meyerland Area		$ 220,781,916.00	$ 220,781,916.00
COH	Brays Mid-Reach	Brays Bayou	Willowbend		$ 201,299,482.00	$ 201,299,482.00
COH	Brays Mid-Reach	Brays Bayou	Sharpstown Area and Richmond Plaza		$ 206,695,061.00	$ 180,430,995.00
COH	Keegans	Brays Bayou	Braeburn Valley West		$ 104,727,014.00	$ 104,727,014.00
COH	Brays Mid-Reach	Brays Bayou	Fondren, US 59 to W. Airport		$ 84,858,937.00	$ 56,096,199.00
COH	Keegans	Brays Bayou	Brays Oaks		$ 51,352,571.00	$ 51,352,571.00
COH	Brays Mid-Reach	Brays Bayou	Harwin, Fondren Rd to US 59		$ 38,029,547.00	$ 38,029,547.00
HCFCD	F-07	Brays Bayou	Planning, Right-Of-Way Acquisition, Design, and Construction of Channel Conveyance Improvements on Keegans Bayou	1	$ 32,500,000.00	$ 32,500,000.00
COH	Keegans	Brays Bayou	Huntington Village		$ 51,394,925.00	$ 32,127,696.00
HCFCD	F-08	Brays Bayou	Right-Of-Way Acquisition, Design, and Construction of Channel Conveyance Improvements on Fondren Diversion Channel	1	$ 30,500,000.00	$ 30,500,000.00
HCFCD	CI-038	Brays Bayou	Restore Channel Conveyance Capacity Along D115-00-00	2	$ 30,000,000.00	$ 15,000,000.00
HCFCD	C-13	Brays Bayou	Right-Of-Way, Design and Construction of Conveyance Improvements along Bintliff Ditch	3	$ 30,000,000.00	$ 22,500,000.00
COH	Keegans	Brays Bayou	W. Bellfort - Dairy Ashford to US 59		$ 23,966,775.00	$ 18,903,124.00

Brays Bayou			
	Total	CDBG-MIT	Local
HCFCD	$ 123,000,000.00	$ 100,500,000.00	$ 22,500,000.00
HC	$ -	$ -	$ -
COH	$ 1,258,775,590.00	$ 1,157,715,326.00	$ 101,060,264.00
Total	$ 1,381,775,590.00	$ 1,258,215,326.00	$ 123,560,264.00

Agency	ID	Watershed	Project Title
HCFCD	CI-038	Brays Bayou	Restore Channel Conveyance Capacity Along D115-00-00

Political Jurisdiction	Total Cost	CDBG-MIT	Local Share
2	$ 30,000,000.00	$ 15,000,000.00	$ 15,000,000.00

Harris County, Texas

1001 Preston St., Suite 934
Houston, Texas 77002

Legislation Details (With Text)

File #:	21-3949	**Version:**	1	**Name:**	
Type:	Recommendation for authorization			**Status:**	Agenda Ready
File created:	8/2/2021			**In control:**	Commissioners Court
On agenda:	8/10/2021			**Final action:**	

Title: Recommendation to initiate and proceed with a project to restore channel conveyance capacity along Cypress Slough Ditch. (Brays Bayou Watershed, Bond ID CI-038, HCFCD Unit D115-00-00, Precinct 3).

To: Harris County Commissioners Court

Through: Alan R. Black, P.E., Interim Executive Director, Harris County Flood Control District
Prepared By: Matthew K. Zeve, P.E., Deputy Executive Director, Harris County Flood Control District

Subject: New Bond Project Authorization
Project ID (If applicable]: N/A

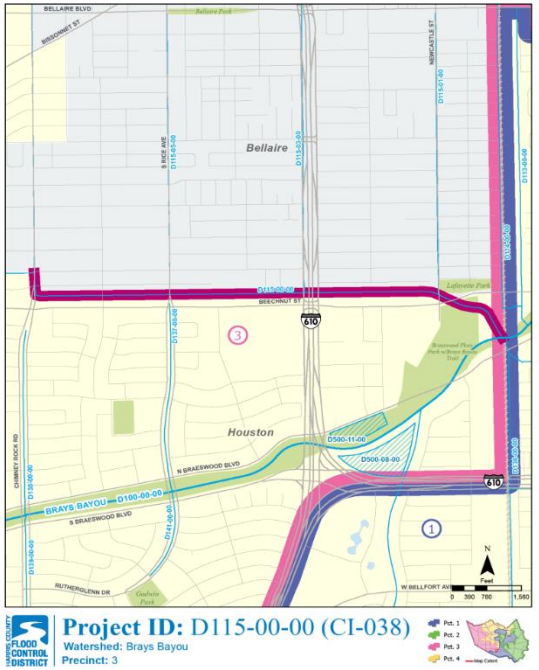
Purpose and Request:
Recommendation to initiate and proceed with a project to restore channel conveyance capacity along Cypress Slough Ditch. (Brays Bayou Watershed, Bond ID CI-038, HCFCD Unit D115-00-00, Precinct 3).
Background and Discussion:
This project scores in the 4th quartile under the Bond Prioritization Framework approved by Commissioners Court in 2019. This will be a partnership project with the City of Houston and the City of Bellaire.

Alternatives:
The alternative is not to proceed with the project.

Alignment with Strategic Objective:
SO1.1 - Continuously plan CIP projects to improve conveyance capabilities of Harris County through addition of assets to FCD infrastructure and improving existing assets within FCD's existing infrastructure.

SO2.1 Reducing flooding risks across Harris County by completing projects in the 2018 Harris County Flood Control District Bond Program by 2030.

Attachments: Vicinity map



On 8/10, Project CI-038 was confirmed to proceed by a unanimous vote of the Commissioners Court

Project is intended to improve conveyance capacity in Cypress Ditch

Discussions regarding scope and phasing are ongoing

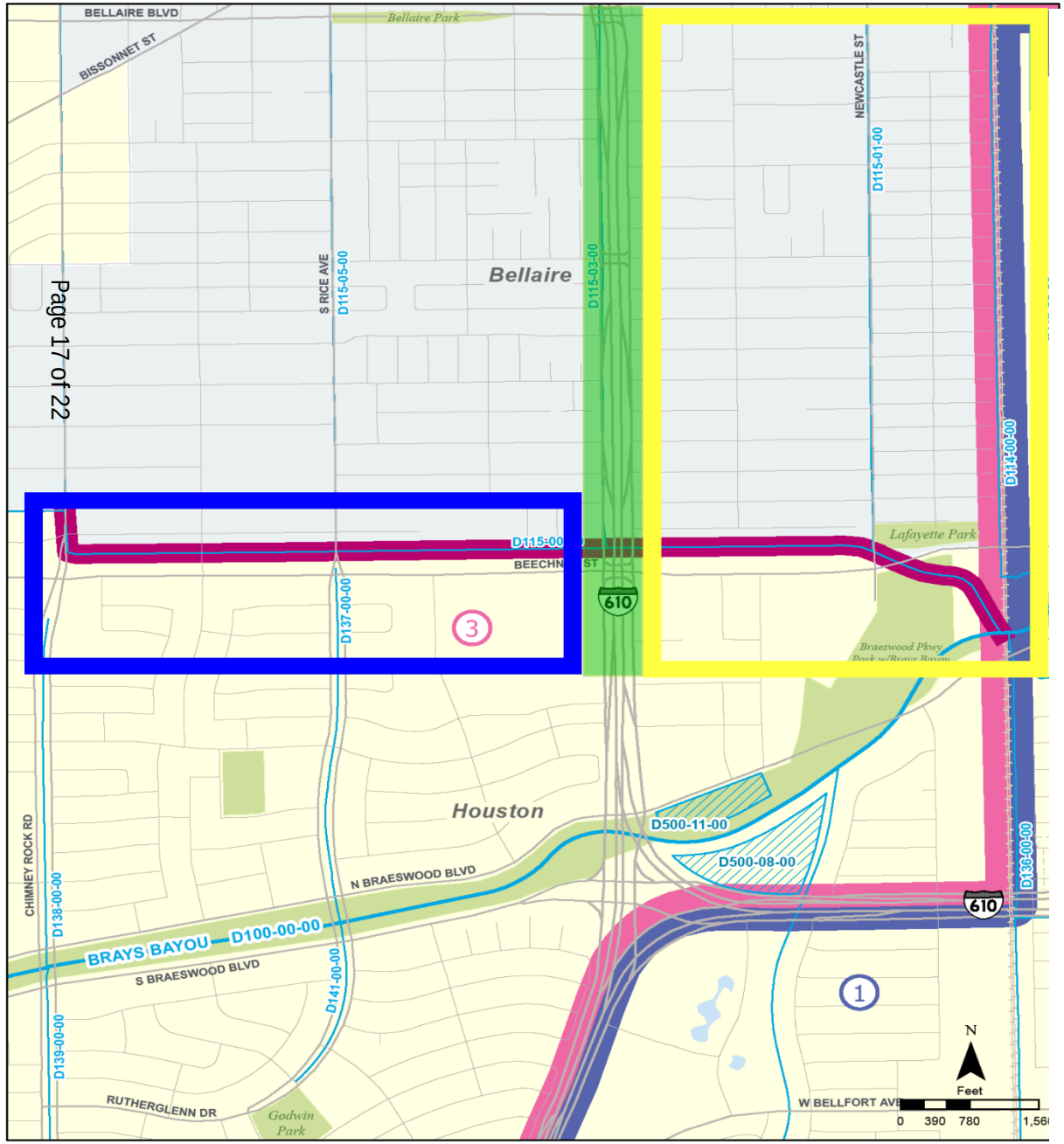
City of Bellaire

FY 2022 – 2026 ADOPTED CAPITAL IMPROVEMENT PLAN

Project Code & Name	Funding Source
DR2202 - Regional Drainage Project	Capital Bonds Interlocal Cooperation Grant Funding

FY22	FY23
$16,000,000	$19,000,000

MDCP Implementation/ Drainage Project Funding Options		
Entity	**Source**	**Amount**
COB	FY 2022 Authorization of Existing Bond Funds for DR2202	$5,500,000
COB	Unappropriated bond/ CIP funds or matching grant funds	$5,500,000
COB	Bond sale-Existing authority	$6,000,000
COB	COB-ARP Funding	4,700,000
HCFCD	CI-038 Project Funding - Existing Bond Proceeds	$15,000,000
HCFCD	Local Project Matching Funds	Unknown/TBD
COH	Unidentified funding for Cypress Ditch-Phase 2	$15,000,000/TBD
TXDOT	Unidentified IH-610 Drainage Project Funds	Unknown/TBD



- **Phase 1 Project Approach**
  Joint partnership opportunity with HCFCD for Newcastle and Phase 1 (610 to Brays) Cypress Ditch improvements

- **IH610 Improvements:**
  Work with TXDOT on scope and approach, to include Cypress Ditch improvements within TXDOT ROW

- **COH-Cypress Ditch- Ph2**
  COH project to improve Cypress Ditch with consideration of MDCP findings and COH goals

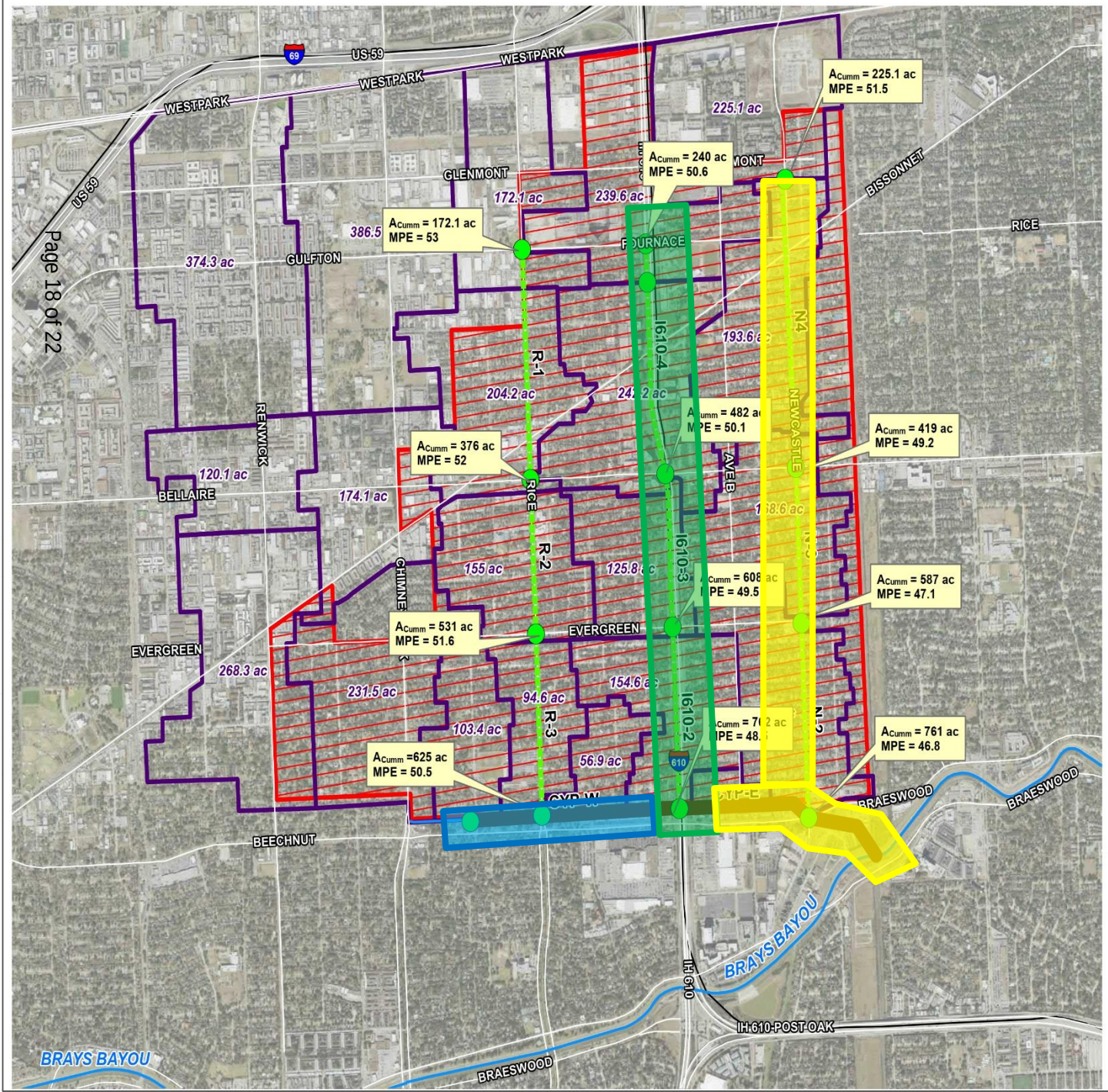
HARRIS COUNTY FLOOD CONTROL DISTRICT

Project ID: D115-00-00 (CI-038)

Watershed: Brays Bayou

Precinct: 3

Pct. 1
Pct. 2
Pct. 3
Pct. 4
Map Extent



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BELLAIRE MASTER DRAINAGE PLAN
CONCEPT DESIGN

CONCEPT C

JOB NO.:2019280-MDP-01-002	DATE: MAR 2020	BY: CRC

EXHIBIT 3-C

Flood Hazard Mitigation Taskforce Meeting Summary:

- Consensus - Accept Report Findings
- Quarterly Meetings of the Task Force
- Engage Technical Advisor and begin work on PER Development
- Proceed with next steps for implementation while refining the report as needed
- Move quickly with confirmed prioritization of Cypress Ditch Phase 1 and Newcastle
- Keep Community Informed

Next Steps:

- Accept the findings of the MDCP Report as presented
  - Report becomes a “living document” that guides future activities and is modified to reflect phasing, funding, and other aspects of implementation
  - Focus shifts to implementation and ways to identify manageable near-term improvements with long-term goals in mind
    - Modifications to the final version of the MDCP will continue along with additional opportunities for public outreach and input
- Engage a Technical Advisor to begin facilitating the following:
  - Provide guidance regarding PER and project implementation options
    - Scope of Phase 1 improvements for Cypress Ditch/Newcastle improvements which would utilize HCFCD existing bond funds
    - Project scope and design parameters for Phase 2 of Cypress Ditch improvements to be completed by COH
    - Coordinate future phasing options and PER analysis for other phases

Next Steps:

- Finalize partnership terms with COH
  - COH utilization of Bellaire portion of Ruffino Hills
  - COB acquisition of Brays Bayou watershed detention credits from COH
  - Input on non-COB projects affecting area drainage (e.g. Chimney Rock improvements)
- Work with TXDOT regarding drainage improvements along IH610
  - Consideration of MDCP findings
  - Review options for project approach and funding
- Coordination with UPRR and CenterPoint to meet objectives
  - Explore options for utilization of and improvements within the ROW of both entities

Master Drainage Concept Plan Results and Next Steps

PUBLIC WORKS DEPARTMENT