



**LONG-TERM FLOOD RECOVERY PLAN
PUBLIC MEETING No. 3
CITY OF JERSEY VILLAGE**

JUNE 27, 2017

Presented by:

DANNENBAUM

STUDY PURPOSE

The goal of the study is to develop a hydraulically feasible and cost-effective Long-term Flood Recovery Plan that is acceptable to the City of Jersey Village residents and elected city officials.

THE STUDY PROCESS

The project was broken up into three phases with a public meeting for each phase:

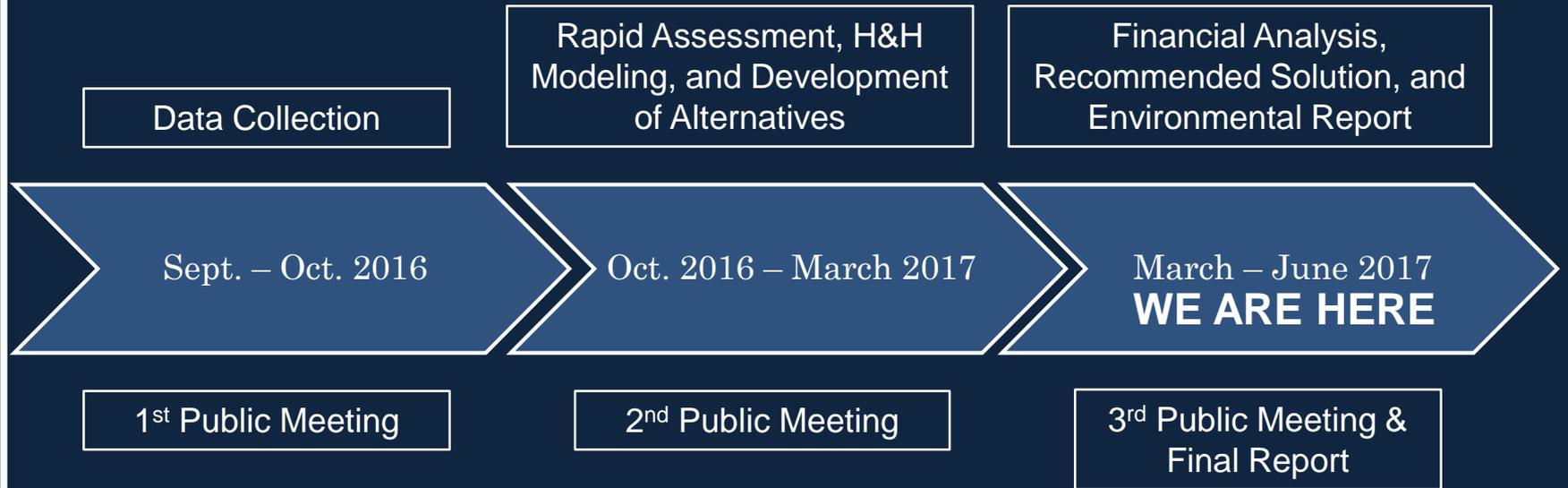
- Data Collection
- Preliminary Assessment, Technical Analysis, and Development of Alternatives
- Recommended Solution, Benefit-Cost Analysis, and Plan Finalization

STUDY END STATE

Find a solution that is
feasible in these areas...



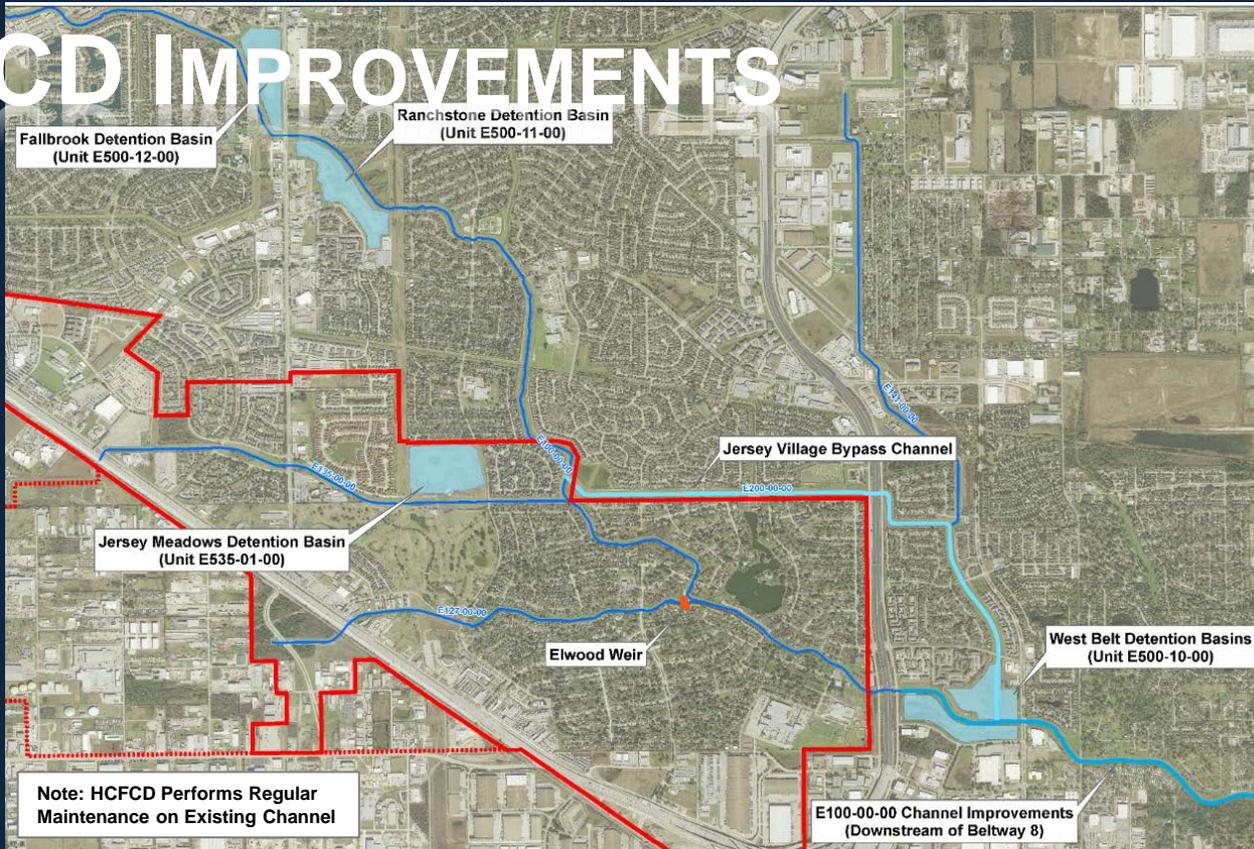
PROJECT SCHEDULE & SOCIAL CONSIDERATIONS



STUDY BACKGROUND

- Chronic Flooding in Jersey Village
 - Tropical Storm Frances (1998)
 - Tropical Storm Allison (2001)
 - September 2002 Flood
 - Tax Day Flood (April 2016)
- Many homes have flooded more than 3 times in 20 years despite improvements
- HCFCD has constructed \$95M in projects in the White Oak Bayou (WOB) Watershed

HCFC D IMPROVEMENTS



HCFC D IMPROVEMENT BENEFITS IN JERSEY VILLAGE

- Before HCFC D Improvements: 100-year Damages
 - \$70,200,000
 - 611 TOTAL Flooded Structures
- After HCFC D Improvements: 100-year Damages
 - \$11,400,000
 - 163 TOTAL Flooded Structures
- Avoided Damages due to HCFC D Improvements
 - \$58,800,000
 - 448 Structures

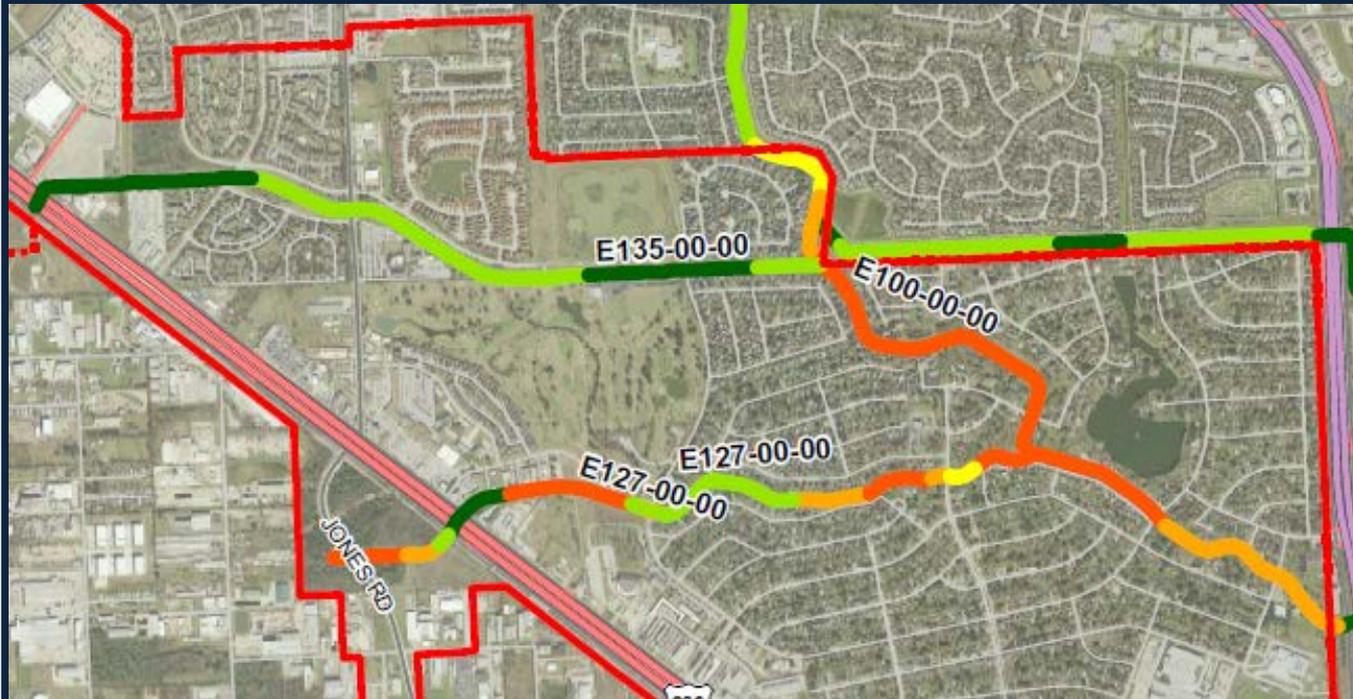
FUTURE HCFC D IMPROVEMENTS

- WOB Federal Flood Damage Reduction Project
 - Channel improvements along WOB from Cole Creek to upstream tributary (formally known as Unit E122-00-00)
 - Channel improvements from Jersey Village Channel to FM 1960
 - Expansion of two stormwater detention basins
- Currently waiting on federal funding to complete the project
- When funding becomes available, the priority is to finish partially completed projects downstream

REVISED EXISTING CONDITIONS

- Based on data recently submitted to FEMA
- Alterations for study purpose
- Includes most recent improvements by HCFCD
 - Jersey Village Channel (Bypass) & E141-00-00
 - Ranchstone Detention Basin
 - WOB Channel Improvements downstream of Gessner
 - West Belt Detention Basin
- 10-year Bayou Level of Protection in Jersey Village (no homes flooded)

REVISED EXISTING LEVEL OF PROTECTION



Legend

- City of Jersey Village
- ETJ

Level of Protection

Revised Existing

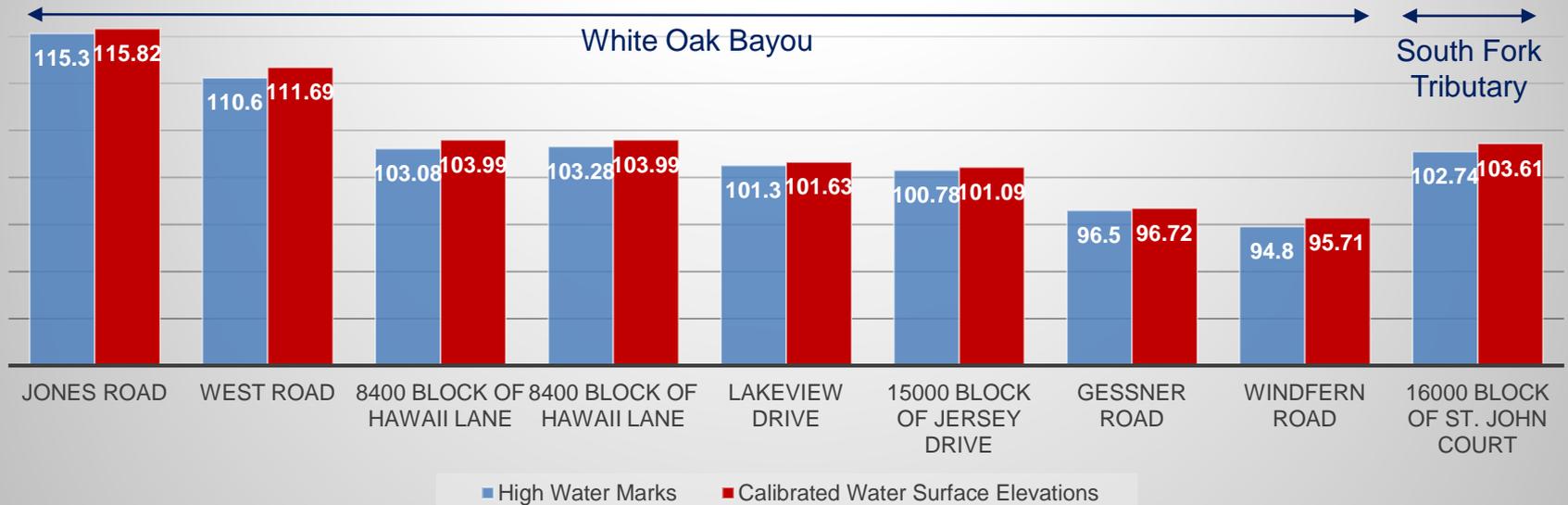
- 10-yr Event
- 25-yr Event
- 50-yr Event
- 100-yr Event
- 500-yr Event

TAX DAY FLOOD MODEL VALIDATION

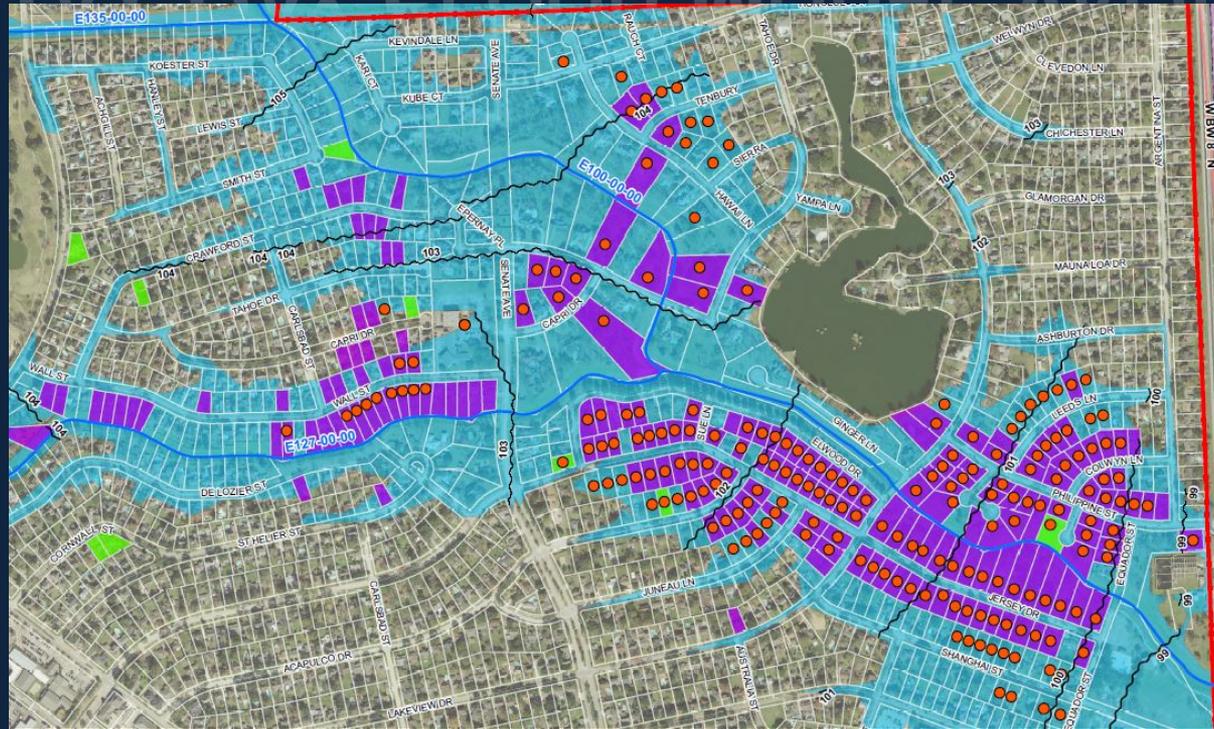
- Used actual rain gauge data
 - Rainfall had average return interval of 240 years
- Results very close to actual event
 - 208 flooded homes
 - $\pm 1'$ of High Water Marks (HCFCD & DEC's topo survey)

TAX DAY FLOOD MODEL VALIDATION

Tax Day Flood Calibration: High Water Marks



TAX DAY FLOOD MODEL VALIDATION



SI Calibrated Model Results

April 18, 2016

-  Theoretical Flooded Properties

Affected Parcels

April 18, 2016

-  Entire Home
-  Garage Only

INDIVIDUAL ALTERNATIVES

- Structural Alternatives
 - Elwood Weir Removal
 - South Fork Tributary Channel Improvements
 - Federal Project WOB Channel Improvements
 - Bridge Improvements
 - Bypass Improvements
 - Wall St Neighborhood Improvements
 - Golf Course Detention
- Non-structural Alternatives
 - Home Elevations
 - Buyouts
 - Demo/rebuild
 - Community Rating System (CRS)

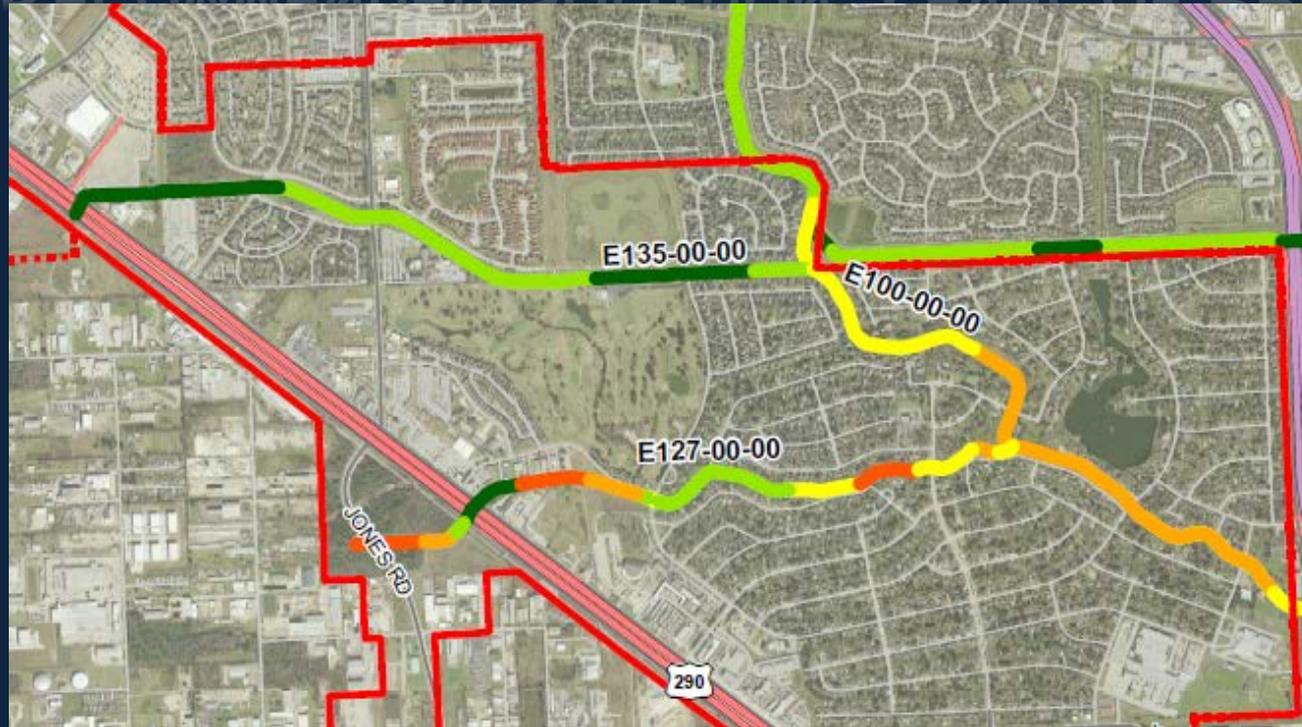
INDIVIDUAL ALTERNATIVES

- Alternatives NOT Recommended:
 - Elwood Weir Removal
 - South Fork Tributary Channel Improvements
 - Bridge Improvements
 - Bypass Improvements
 - Demo/rebuild

RECOMMENDED SOLUTION: STRUCTURAL

- Recommended Alternatives to alleviate the 100-year Event:
 - Golf Course Detention
 - Federal Project WOB Channel Improvements
- Other recommended improvements:
 - Wall Street Neighborhood Storm Sewer System Improvements
- *These improvements would remove 62 homes from the 100-year Floodplain*

RECOMMENDED SOLUTION: LEVEL OF PROTECTION



Legend

- City of Jersey Village
- ETJ

Level of Protection

Preferred Solution

- 10-yr Event
- 25-yr Event
- 50-yr Event
- 100-yr Event
- 500-yr Event

RECOMMENDED SOLUTION: NON-STRUCTURAL

- 62 Homes removed from the floodplain due to structural improvements
- 101 Homes remain in the 100-year floodplain after implementation of structural solutions
 - 58 viable candidates for non-structural solutions
 - Based on Repetitive Loss or Severe Repetitive Loss Classification
 - Greater than 6” of inundation
 - Homes substantially damaged during the Tax Day Flood (> 50% of home value)
 - 43 Homes remain at risk for minimal damages (< 6” of damage)

RECOMMENDED SOLUTION: NON-STRUCTURAL

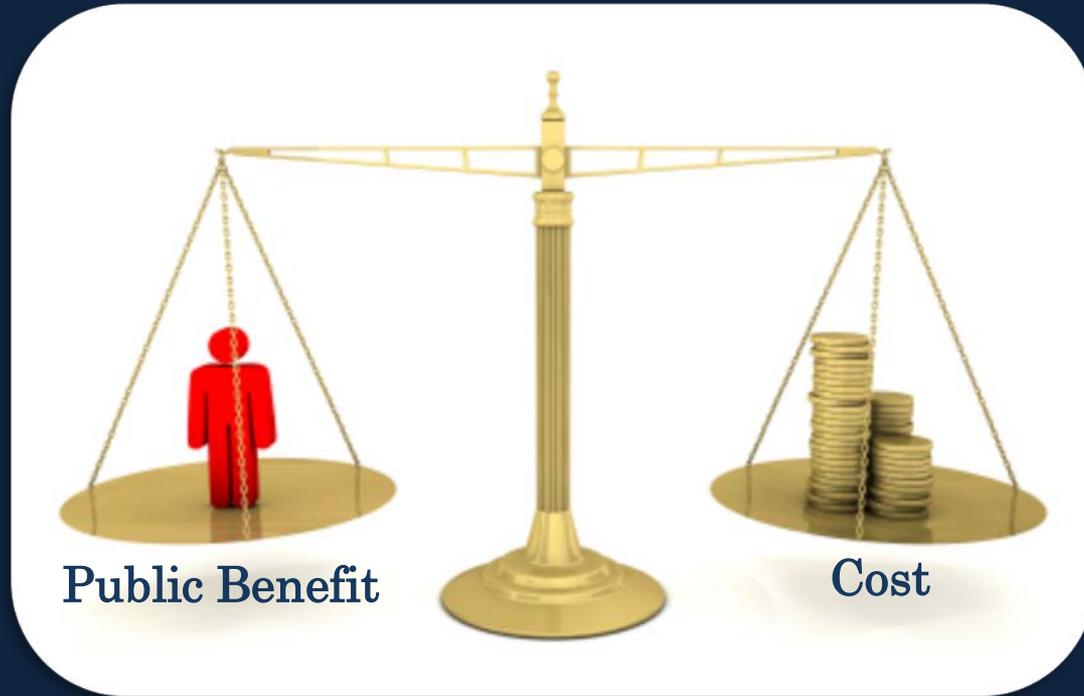
- Enroll in Community Rating System
 - NFIP Program to reduce flood insurance rates
 - Optional for each community
 - Worst rating is 10, best is 1

Rate Class	Credits Earned	Discount
10	0 - 499	0%
9	500 - 999	5%
8	1,000 - 1,499	10%
7	1,500 - 1,999	15%
6	2,000 - 2,499	20%
5	2,500 - 2,999	25%
4	3,000 - 3,499	30%
3	3,500 - 3,999	35%
2	4,000 - 4,499	40%
1	4,500 +	45%

ENVIRONMENTAL CONSIDERATIONS

- Phase 1 Environmental Site Assessment completed for Jersey Meadows Golf Course
 - No contaminants found within project area
 - No soil remediation required for construction
 - No environmental mitigation required
- Federal Channel Improvements Project covered by USACE Environmental Document

ECONOMIC ANALYSIS



RECOMMENDED SOLUTION: STRUCTURAL BENEFITS

	Number of Homes Flooded During Each Storm Event		Number of Homes Removed from the Floodplain	% Difference Between Existing and Recommended Plan
	Before (Rev. Existing)	After (Rec. Plan)		
10-yr	0	0	0	0.0%
25-yr	26	0	26	100.0%
50-yr	103	16	87	84.5%
100-yr	163	101	62	38.0%
240-yr (TDF)	208	182	26	12.5%
500-yr	429	397	32	7.5%

RECOMMENDED SOLUTION: STRUCTURAL BENEFITS

	No. of Flooded Structures	
	100-yr Event	Tax Day Event
Before	163	208
After	101	182
Avoided Damages	62	26

- 100-year Flood Avoided Damages = \$5,400,000
- Tax Day Flood Avoided Damages = \$3,700,000

RECOMMENDED SOLUTION: STRUCTURAL COST

- Recommended Alternatives to alleviate the 100-year Event:
 - Golf Course Detention Cost: \$750,000
 - Federal Project WOB Channel Improvements Cost: \$4,600,000Total Cost: \$5,350,000

- Other recommended improvements:
 - Wall St Neighborhood Storm Sewer Estimated Cost: \$2,000,000
 - Wall St Neighborhood Street Improvements Estimated Cost: \$3,750,000Total Cost: \$5,750,000

RECOMMENDED SOLUTION: NON-STRUCTURAL COST

	Alternative 1	Alternative 2
	All Structural Elevations	Home Buy-outs and Structural Elevations
Number of Buyouts	0	26 (45%)*
Number of Home Elevations	58	32 (55%)*
Total Cost	\$10,500,000	\$11,500,000
Estimated Local Share Cost	\$2,400,000	\$2,800,000
Avoided Damages (100-yr Event)	\$4,800,000	\$4,800,000

*Preliminary assumption based on varying criteria

NON-STRUCTURAL COST SHARE SUMMARY

Grant Program	FEMA Funding Available	
	Property Acquisition and Structure Demolition (Buyouts)	Structure (Home) Elevation
Flood Mitigation Assistance (FMA)*	SRL: 100% Federally Funded RL: 90% Federally Funded Other: 75% Federally Funded	SRL: 100% Federally Funded RL: 90% Federally Funded Other: 75% Federally Funded
Pre-Disaster Mitigation (PDM)	75% Federally Funded	75% Federally Funded
Hazard Mitigation Grant Program (HMGP)**	75% Federally Funded	75% Federally Funded

*Flood insurance is required for FMA.

**HMGP funds require a Presidential Disaster Declaration

NON-STRUCTURAL GRANT RECOMMENDATIONS

- Recommended Grant Program: FMA Grant
 - Best cost share for Severe Repetitive Loss and Repetitive Loss Homes
 - Flood Insurance is REQUIRED for each home on the application
 - Local sponsor prepares and submits application
 - Grant application can include Home Buyouts and Home Elevations
 - Applications with large numbers of SRL/RL homes are given priority

FUNDING SOURCES

Structural Alternatives

- Local
 - City – CIP
 - HCFCD Funds
 - USACE
- State
 - TWDB
- Federal Funds
 - FEMA
 - NRCS

Non-structural Alternatives

- Federal Funds
 - TWDB/FEMA
 - ICC (homeowner application)
- Non-federal Funds
 - Local Sponsor: HCFCD, City of Jersey Village
 - Homeowner

RECOMMENDED SOLUTION PHASING

Phases

1. Jersey Meadows Golf Course
2. Wall St Neighborhood Improvements
3. Non-structural alternatives
4. Federal Project WOB Channel Improvements

Costs

1. \$750,000
2. \$5,750,000
3. Alt 1 Total = \$10,500,000
Alt 1 Local = \$2,400,000
Alt 2 Total = \$11,500,000
Alt 2 Local = \$2,800,000
4. \$4,600,000

MOVING FORWARD

- Jersey Meadows Golf Course
 - Upcoming Jersey Village CIP revision expected to include golf course project
- Wall Street Storm Sewer Improvements
 - Detailed drainage study currently in progress
 - Upcoming Jersey Village CIP revision expected to include Wall Street storm sewer drainage improvements
- Federal Project WOB Channel Improvements
 - Already approved project, just waiting on funding

PANEL DISCUSSION

Justin Ray
Mayor

Austin Bless,
MPA, ICMA-CM
City Manager

Kevin Hagerich
Director of Public Works

Alejandro Flores,
P.E., CFM
*Hydrology & Hydraulics
Division Manager/Chief
Hydrologist*

Christopher
Sallese, PMP
*Coastal Programs
Manager*

Maegan Nunley,
P.E., CFM
*Lead Engineer,
Hydrology & Hydraulics*

Jenna Gardner,
EIT, CFM
*Engineer, Hydrology &
Hydraulics*