

CHAMBERS CREEK FLOOD ASSESSMENT & MASTER DRAINAGE STUDY FINAL REPORT PRESENTATION

City Council Meeting March 5, 2024



Introductions



Andrew Luce, PE, CFM

aluce@tnpinc.com



Mandy Clark, PE, CFM, AICP mclark@tnpinc.com



Sawyer Maness, PE, CFM

smaness@tnpinc.com



Modou Jobarteh, EIT mjobarteh@tnpinc.com



Study Purpose

Identify flood risks within the Chambers Creek floodplain – traffic safety and property protection.

Develop conceptual solutions and cost estimates for problem areas.

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Comn

Grant Funding

Hazard Mitigation Grant Program (HMGP)

- Administered through Texas Division of Emergency Management (TDEM)
- Managed through Tarrant County



Scope Summary





DATA COLLECTION



Report & Presentatio

Additional Data Collection

- Historic flooding data
- Topographic Survey
- Available, physical plans, models, studies
- Staff Workshop/Surveys/Emails
- Public Involvement

STAFF WORKSHOP May 9, 2023

- Emergency Services
- Public Works
- Field Staff
- Long Term Staff
- TNP
- County



Existing Conditions Modeling Problem Area Identification Solution Alternatives Development

Report & Presentation

2018 Flood Damage Data From City Staff





15

homes with unknown damage



businesses flooded 18" deep

500,000 sf



Public Involvement

Existing Conditions Modeling Problem Area Identification Solution Alternatives Development

Report & Presentation

2018 Flood Damage Data From City Staff



Structure Affected: 2" to 12" Flooring, Furniture

Minor Flooding: 8" to 18" Flooring, Drywall, Furniture

Major Flooding: 12" to 72"

Flooring, Cabinets, Drywall, Furniture, Clothing, Structural, Vehicles



PUBLIC INVOLVEMENT



Public Involvement

The City of Everman in partnership with Tarrant County is using grant funds to study flooding of Chambers throughout the City. The City and County have hired the engineering firm, TNP, to assist with this The City of Everman in partnership with Tarrant County is using grant funds to study floading of Creek throughout the City. The City and County have hired the engineering firm, The first step in the process is gathering as much available information as possible to understand Creek throughout the City. The City and County have hired the engineering firm, TNP, to statist the study focus locations. On the back of this sheet is a survey to gather effort. The first step in the process is gathering as much available information as possible to understand feedback from property owners in the area. This will be used to gather data from people who have flooding in the area and guide the study focus locations. On the back of this sheet is a survey to guide the output of the output of the study effort is focused on Gather data from people who have a flooding. This current flood study effort is focused on Chambers Creek flooding, so if you

feedback from property owners in the area. This will be used to gather data from people who have flooding experience or information related to properties that have flooded please complete the experienced flooding. This current flood study effort is focused on Chambers Creek flooding, so if you survey and return it as convenient for you.

If you would like to return the paper copy, please either mail or deliver it to:

If you prefer, you may complete the form online by using this QR Code:

h addition to this survey, a public meeting will be held to gather information from the community of allow one on one discussion of drainage concerns. Please In addition to this survey, a public meeting will be held to gather information from the community bring any photographs or other information to the open house.

CHAMBERS CREEK FLOODING PUBLIC MEETING

WEUNESDAT, JUNE 41 4:00 - 8:00 PM EVERMAN CIVIC CENTER - 213 RACE ST

Thank you for your help with this important project!

Ann: Mindi Parks/Fload Survey 212 North Race St. Everman, TX 76140

CITY OF *EVERMAN

thp

Surveys/Town Hall Meeting Notices

- Bilingual
- Survey on Back
- Distributed as utility bill inserts
- Website Link

Public Involvement

Existing Conditions Modeling

Problem Area Identification Solution Alternatives Development

Report & Presentation

Town Hall Meeting

Wednesday, June 21 4:00 – 8:00 PM Everman Civic Center

23 Attendees









- Online
- Email/Paper

Notes from Public Meeting









EXISTING CONDITIONS MODELING



Existing Conditions Modeling

- Floodplain Mapping
 - \circ Current FEMA Floodplain
 - $\circ~$ Updated existing conditions
 - Ultimate (built-out) conditions
- Inundation Mapping Properties flooding during various events.

Hydrology: how much water?

Hydraulics: how is it behaving?





Floodplain









Storm Events





Flooding Statistics

With New Modeling

- 101 properties removed from floodplain
- 14 additional properties shown in updated floodplain

Storm Event	Homes/Lots Flooded in the Event
1-Year (100% Chance)	54
5-Year (20% Chance)	93
10-Year (10% Chance)	106
25-Year (4% Chance)	137
50-Year (2% Chance)	162
100-Year (1% Chance)	208
500-Year (0.5% Chance)	279





PROBLEM AREA DENTIFICATION





SOLUTION ALTERNATIVE DEVELOPMENT



Existing Conditions Modeling Problem Area Identification Solution Alternatives Development

Report & Presentatio

Problem Area 1: Race St. & Christie Ave.

Existing Conditions

4 – 84" Corrugated Metal Culverts (CMP)

Properties Inundated By:	
1-year event	32
5-year event	50
25-year event	63
100-year event	81

Bridge Level of Service less than 1-year event.



Existing Conditions Modeling Problem Area Identification Solution Alternatives Development

Report & Presentatio

Problem Area 1: Race St. & Christie Ave.

	1A	1 B	1C	1D
Bridge				
Concrete Channel				
Gabion Channel				
Earthen Channel				
Downstream Grading				
Home Buyouts				



Public Involvement

Existing Condition Modeling

Problem Area Identification Solution Alternatives Development

Report & Presentatio

Gabion Walls







Public Involvement

Existing Conditions Modeling

Problem Area Identification Solution Alternatives Development

Report & Presentatio

Concrete Channel



Alternate 1A

Bridge

- Concrete Channel
 - **Downstream Grading**
- Protects all homes from 10-year event.
- Removes 40 homes from 100-year floodplain





Alternate 1B

Bridge

- Gabion Channel
 - **Downstream Grading**
- Protects all homes from
 5-year event
- Removes 36 homes from 100-year floodplain





Alternate 1C

Bridge

- Earthen Channel
- Home Buyouts
- Downstream Grading
- Protects all homes from 25-year event.
- Removes 66 homes from 100-year floodplain





Alternate 1D

Bridge

lacksquare





Alternate Comparison

	1A	1 B	1 C	1D
Improvements	Bridge Concrete Channel Earthen Channel	Bridge Gabion Channel Earthen Channel	Bridge Buyouts Earthen Channel	Bridge Buyouts Concrete Channel Earthen Channel
Home Protection	10-year	5-year	25-year	100-year
Bridge Level of Service	50-year	50-year	100-year	100-year
Cost Estimate	\$6.3 Million	\$4.7 Million	\$12.5 Million	\$18.1 Million

Existing Conditions Modeling Problem Area Identification Solution Alternatives Development

Report & Presentation

Problem Area 2: Barron Ave. & Porter St.

Existing Conditions

Earthen/Natural Channel

Properties Inundated By:

1-year event	15
5-year event	18
25-year event	19
100-year event	26



Problem Area 2: Barron Ave. & Porter St.

Alternate 2A

Concrete Channel
 Downstream Grading

- Protects all homes from 10-year event
- Removes 11 homes from 100-year floodplain





Problem Area 2: Barron Ave. & Porter St.

Alternate 2B

Earthen Channel

- Protects all homes from 1year event
- Removes 4 homes from 100year floodplain





Problem Area 2: Barron Ave. & Porter St.

Alternate Comparison

	2A Concrete Channel	2B Earthen Channel
Home Protection Level of Service	10-year	1-year
Cost Estimate	\$3.7 Million	\$650,000

- Buyout of all homes would be approximately \$3M.
- Channel grading would be required to protect commercial properties to the south



Existing Conditions Modeling Problem Area dentification Solution Alternatives Development

Report & Presentation

Problem Area 3: E. Enon Ave. & Forest Hill Dr.

Existing Conditions

- Crossing 1: 2 10' x 8' Culverts
- Crossing 2: 3 10' x 8' Culverts
- Crossing 3: 3 10' x 9' Culverts
- Crossing 4: Bridge
- Earthen/Natural Channel

Properties Inundated By:

1-year event	4
5-year event	12
25-year event	17
100-year event	28



Bridges Level of Service less than 1-year event.

Problem Area 3: E. Enon Ave. & Forest Hill Dr.

Improvements

- 1 100-ft Bridge
- 200-ft Bridge
- 300-ft Bridge
 - 10 -10' x 10' Culverts
 - Gabion Channel/Wall

WISTERIA COLUMBINE NorthFork ENON etembere etem SouthFork 3 **JEENO REE** ववयावायाक FORESTIGHT Maxa

Cost Estimate: \$13.2M

- Removes 8 properties from 5-year event.
- Removes 1 property from 100-year floodplain
- Bridge Level of Service = 100-year event.

Existing Conditions Modeling

Problem Area Identification Solution Alternatives Development

Report & Presentatio

Problem Area 4: Enon Ave. & Southway Erosion



Part of Problem Area 3 Improvements.

Cost Estimate: \$2.7M





Public Involvement

Existing Conditions Modeling

Problem Area Identification Solution Alternatives Development

Report & Presentatio

Regional Detention Evaluation





REPORT & PRESENTATION



Public Involvement

Existing Conditions Modeling Problem Area Identification Solution Alternatives Development

Report & Presentation

Final Report

- Executive Summary
- Introduction/Background
- Public Involvement
- Hydrologic Analysis
- Hydraulic Analysis
- Problem Area Identification
- Conceptual Solutions
- Conclusion/Recommendations



Texas Board of Architectural Examiners #BR2673

#10194381 Allen | #10011601 Denton

> Public Involvement

Existing Condition Modeling Problem Area Identification Solution Alternatives Development

Recommendations

Problem Area 1:	Alternate 1D
Race St. & Christie Ave.	(Full Solution)
Problem Area 2:	Alternate 2A
Barron Ave. & Porter St.	(Concrete Channel)
Problem Area 3:	Bridges & Gabions
E. Enon & Forest Hill Dr.	Solution
Problem Area 4:	No improvements.
Enon Ave. & Southway	Alternate 3 will
Erosion	address it.

Race St. & Christie Ave. Phasing Example:







Develop Drainage Capital Improvement Program

- Identify Funding Sources
- Letter of Map Revision



Drainage Capital Improvements Program(CIP)

Develop Drainage CIP:

- 5 10 Year Planning Period
- Includes projects/funding sources
- Current CIP does not include drainage projects



Identify Funding Sources





Texas Water Development Board (TWDB)



Texas Department of Emergency Management (TDEM)

State Flood Plan:

Projects in the plan are a prerequisite for some grants.

Submit projects in the Fall.



Identify Funding Sources

Stormwater Utility Fee

- Fee on utility bills
- Based on CIP
- Typical Fee Basis:

Can be used for:

- Projects
- Staff
- Maintenance
- Environmental Permitting
- Debt Service
- Residential: Flat rate per home Current average is \$7
- Commercial: Based on impervious cover buildings/parking



Letter of Map Revision (LOMR)

Official Change to the FEMA Flood Maps

PROS

- Eliminates flood insurance requirement for those removed
- Single mapping source
- Properties within updated floodplain must purchase flood insurance

CONS

- Properties within updated floodplain
 must purchase flood insurance
- Additional Cost

101 properties removed from floodplain

14 additional properties shown in updated floodplain





QUESTIONS/DISCUSSION

