



CHAMBERS CREEK

FLOOD ASSESSMENT & MASTER DRAINAGE STUDY

FINAL REPORT PRESENTATION

City Council Meeting
March 5, 2024



Introductions



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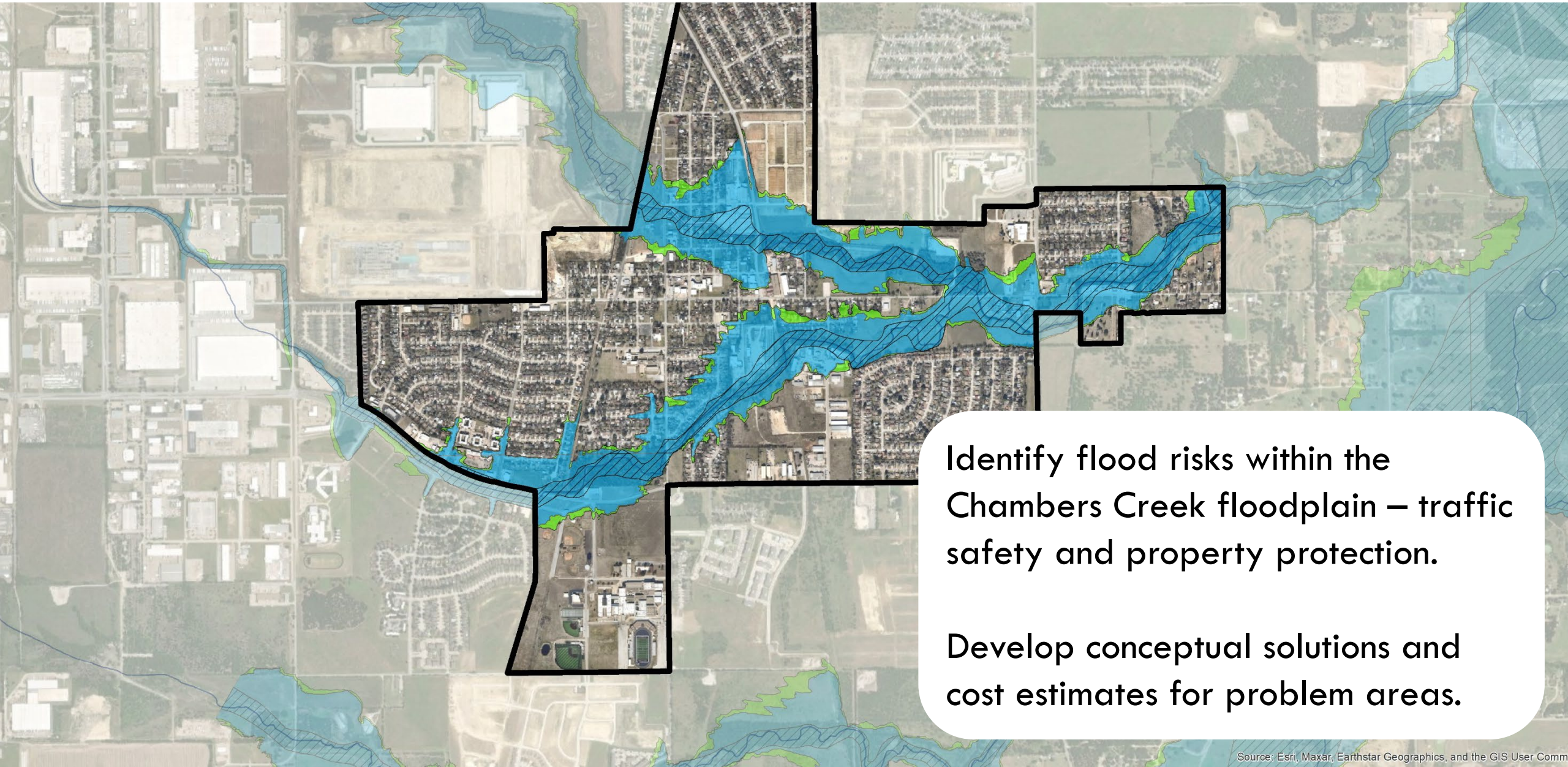


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Study Purpose



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

Develop conceptual solutions and cost estimates for problem areas.

Grant Funding

Hazard Mitigation Grant Program (HMGP)

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



Scope Summary



DATA COLLECTION

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

2018 Flood Damage Data From City Staff



53

homes
flooded



15

homes with
unknown
damage

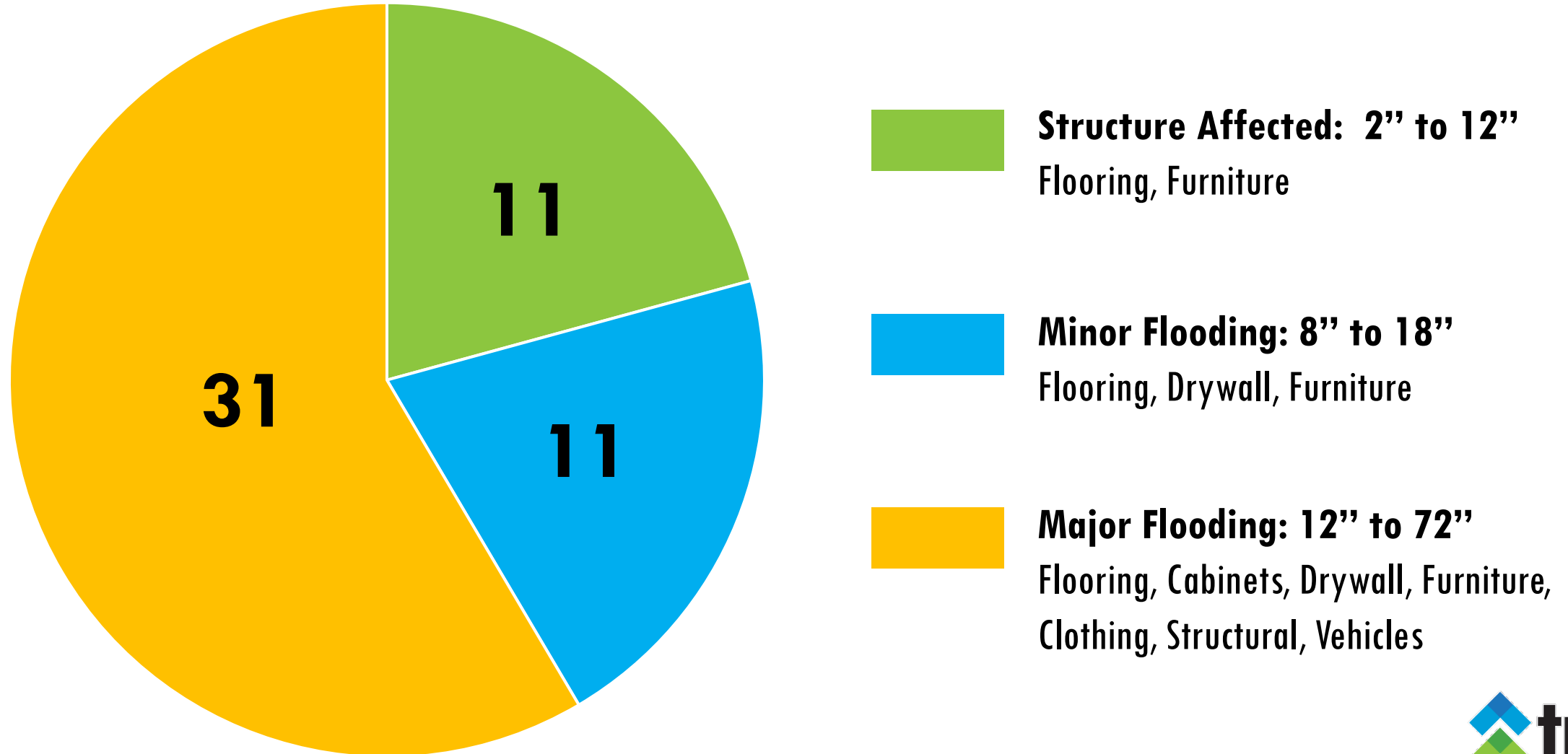


5

businesses
flooded

18" deep
500,000 sf

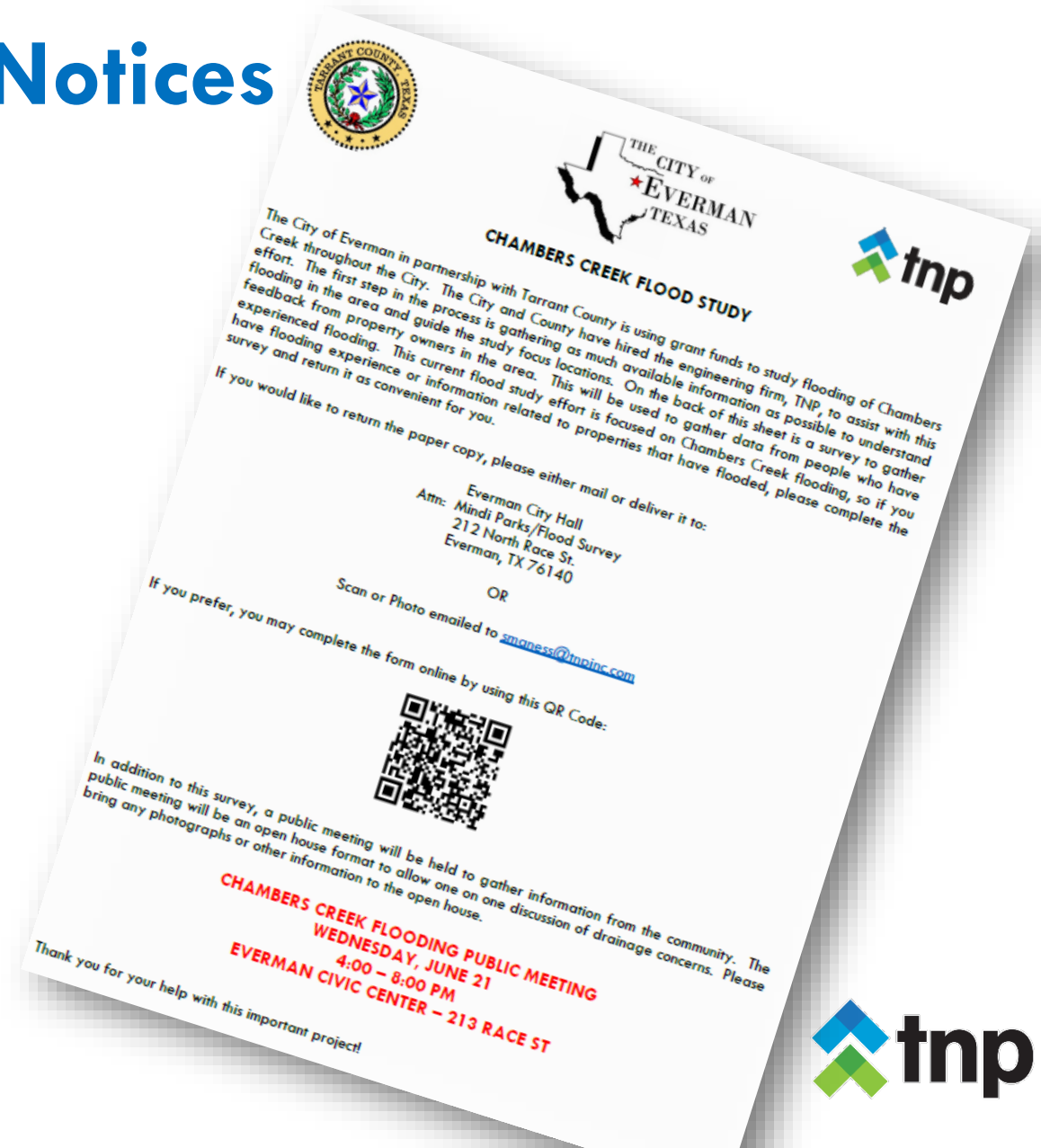
2018 Flood Damage Data From City Staff



PUBLIC INVOLVEMENT

Surveys/Town Hall Meeting Notices

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



Town Hall Meeting

Wednesday, June 21

4:00 – 8:00 PM

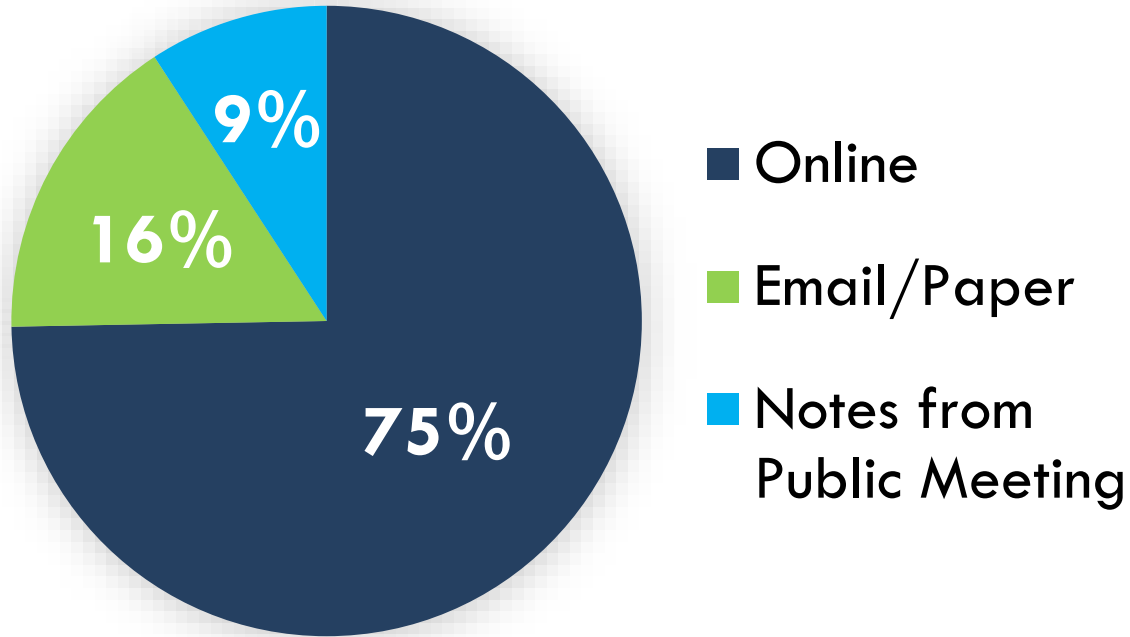
Everman Civic Center

23 Attendees

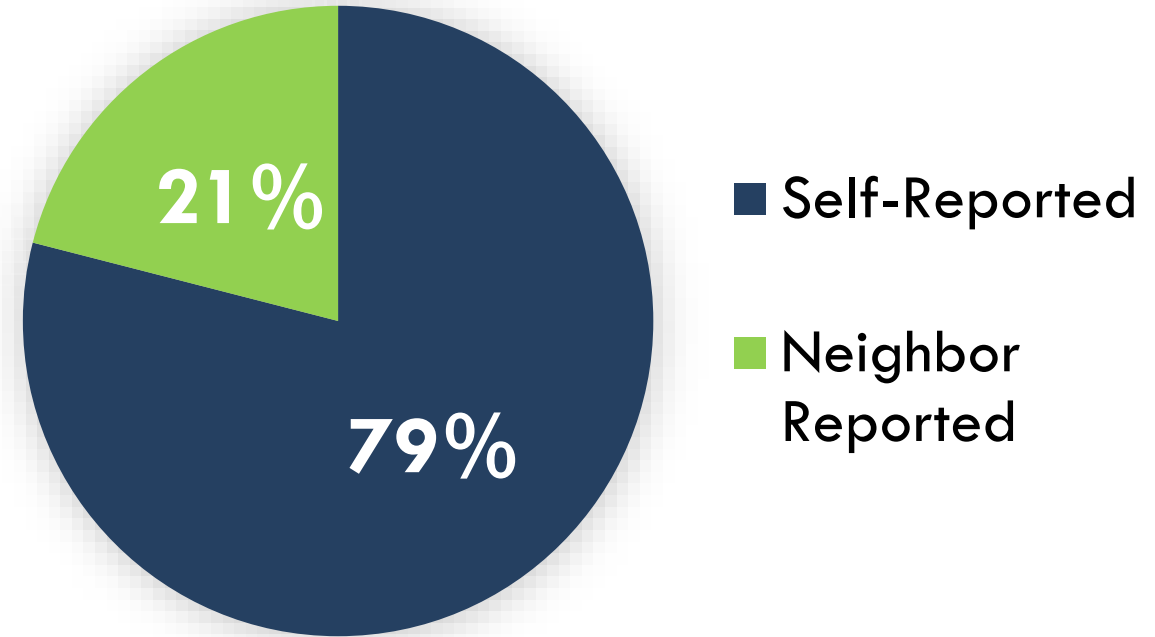


Survey Results

79 Total Responses

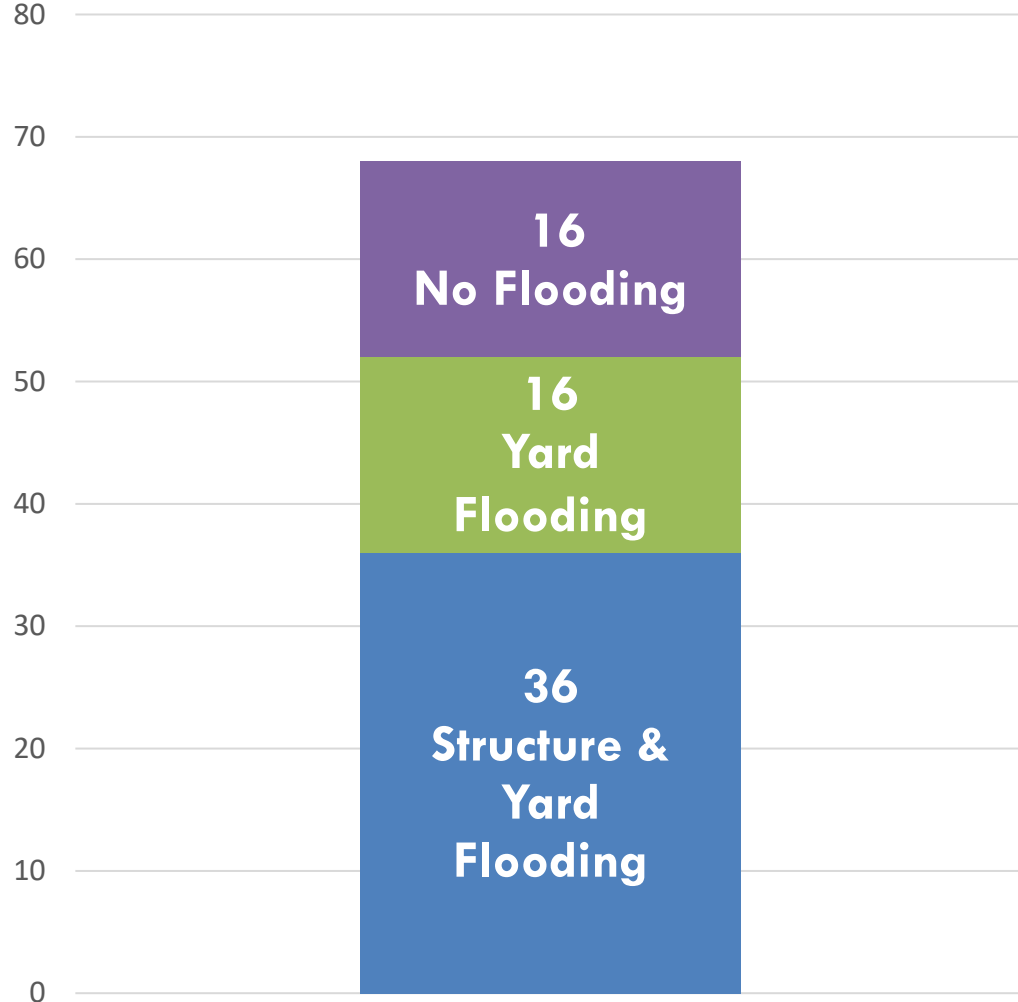


100 Addresses

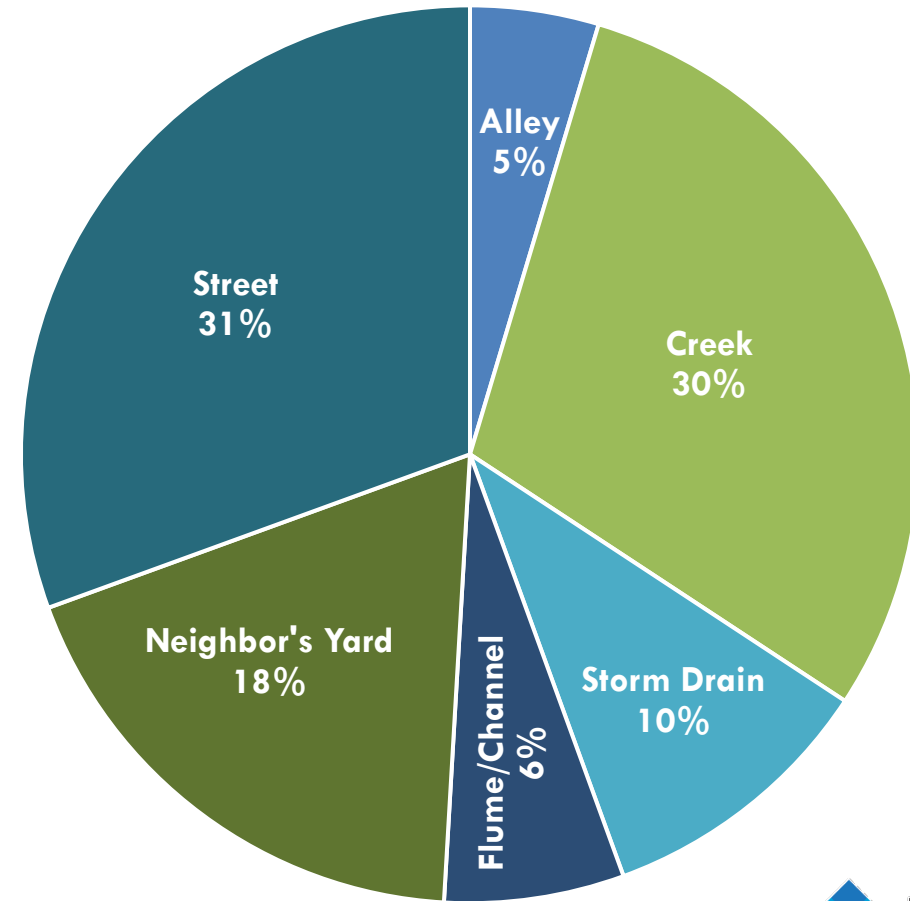


Survey Results




Flooding Type

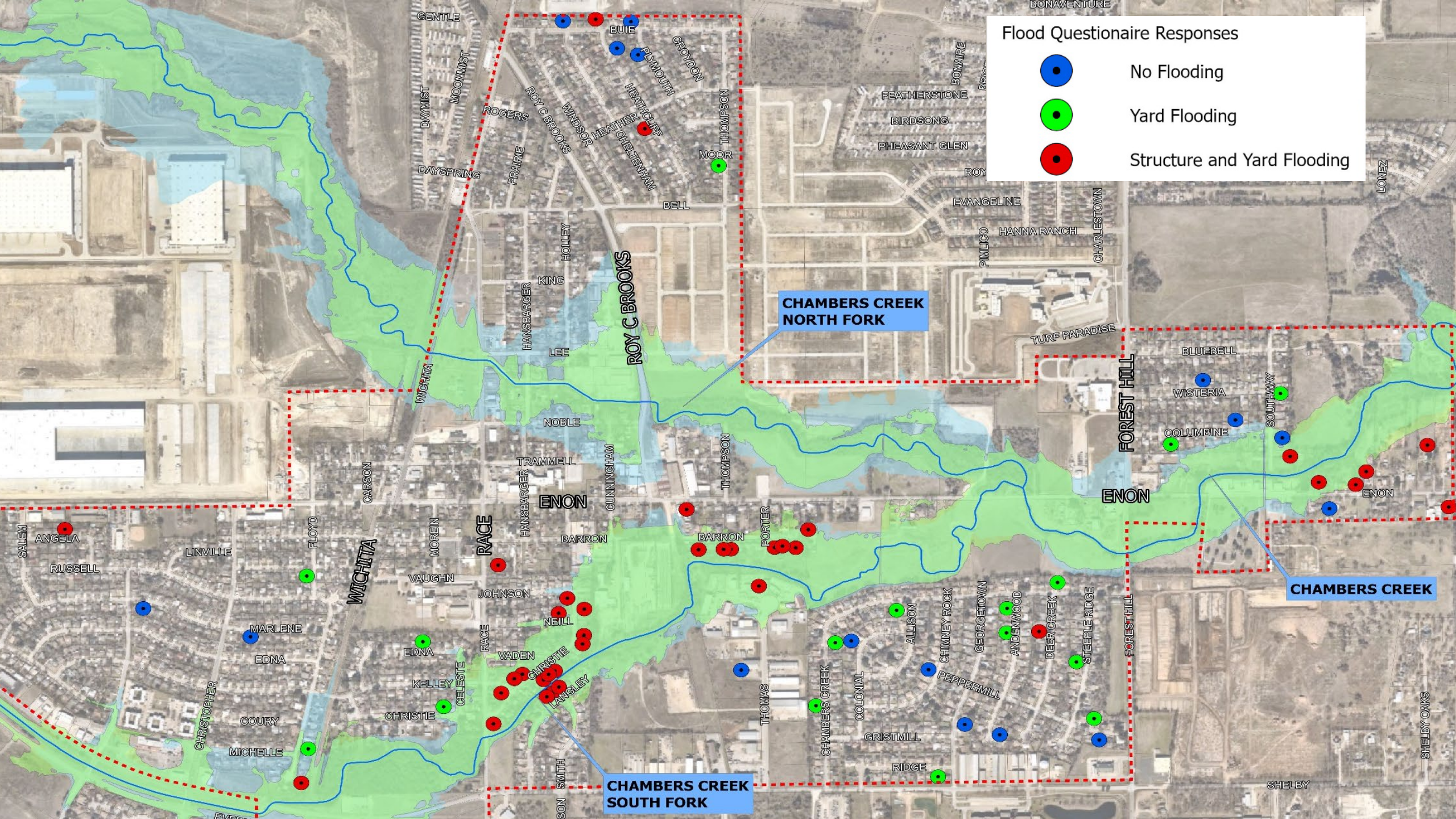


Flooding Source



Flood Questionnaire Responses

-  No Flooding
-  Yard Flooding
-  Structure and Yard Flooding



EXISTING CONDITIONS MODELING

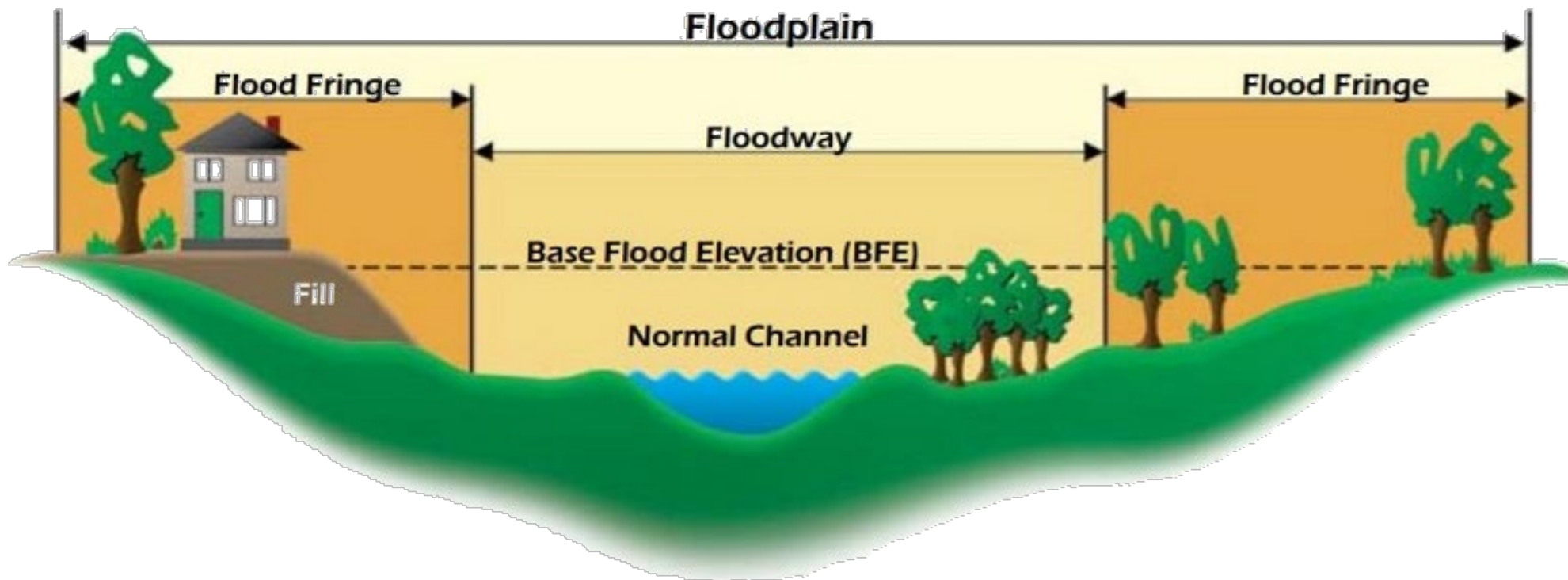
Existing Conditions Modeling

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

Hydrology: how much water?

Hydraulics: how is it behaving?

Floodplain



Data Collection

Public Involvement

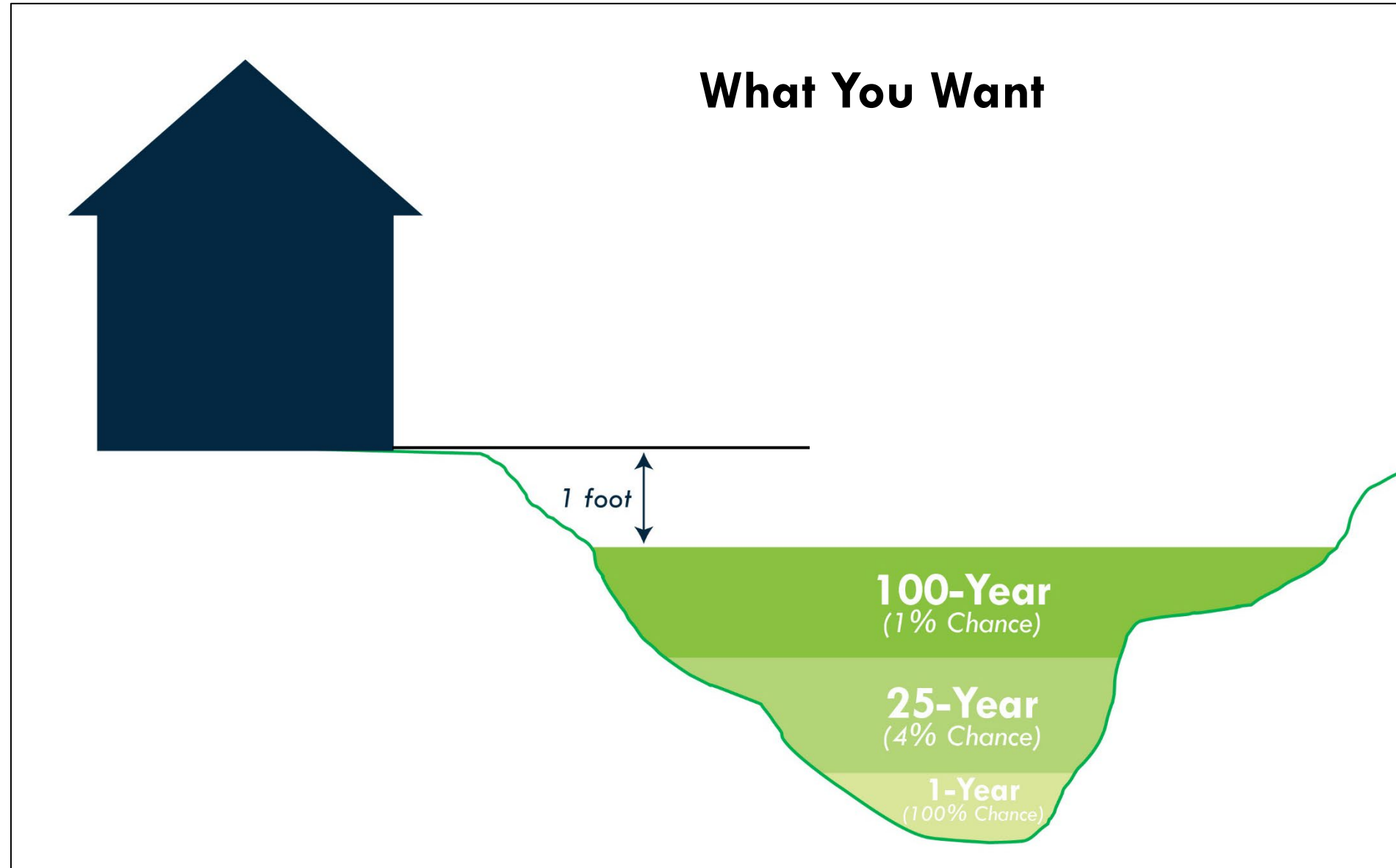
Existing
Conditions
Modeling

Problem Area
Identification

Solution
Alternatives
Development

Report &
Presentation

Storm Events



Data Collection

Public Involvement

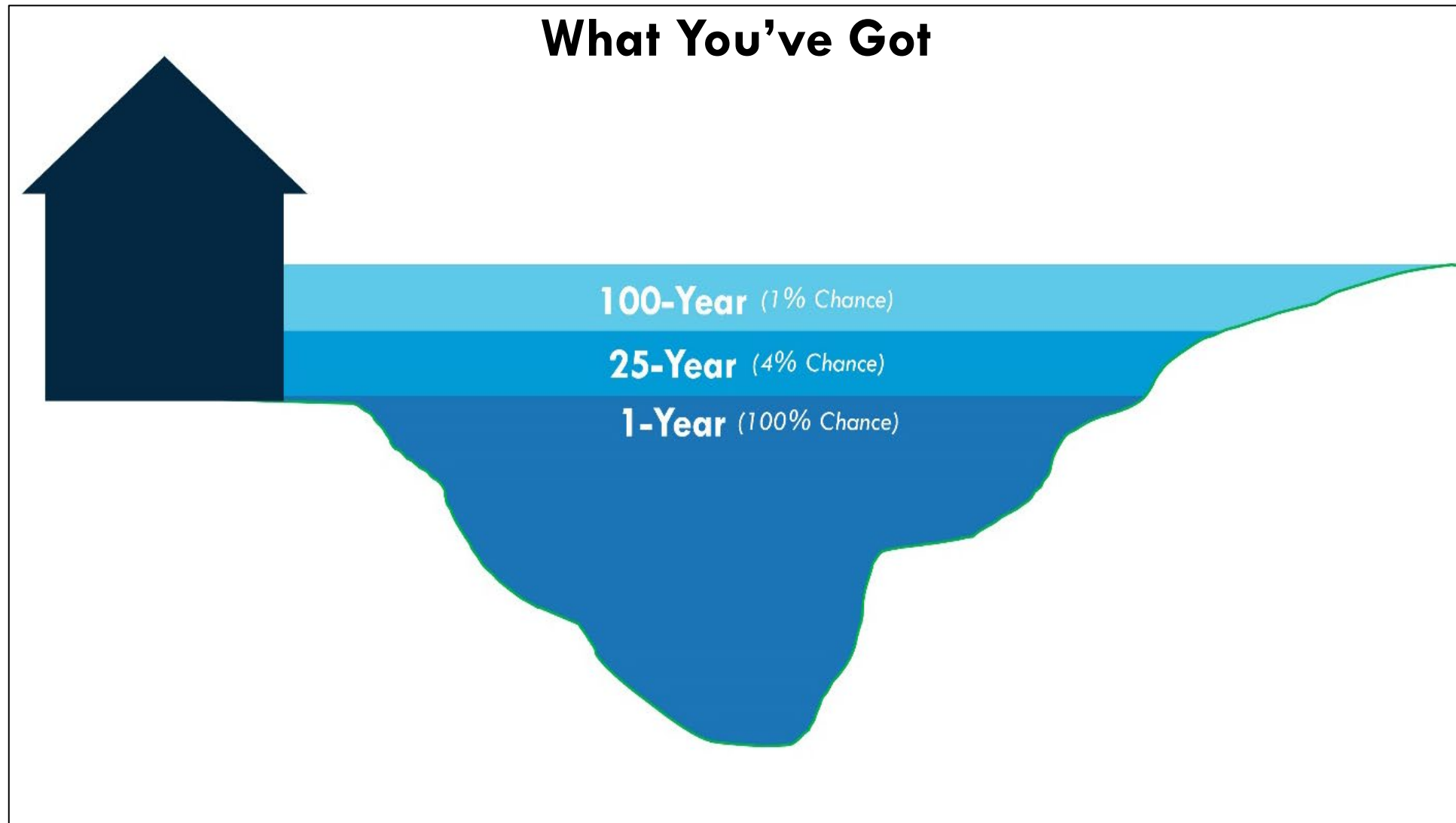
Existing
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Storm Events



Flooding Statistics

With New Modeling

101 properties removed from floodplain

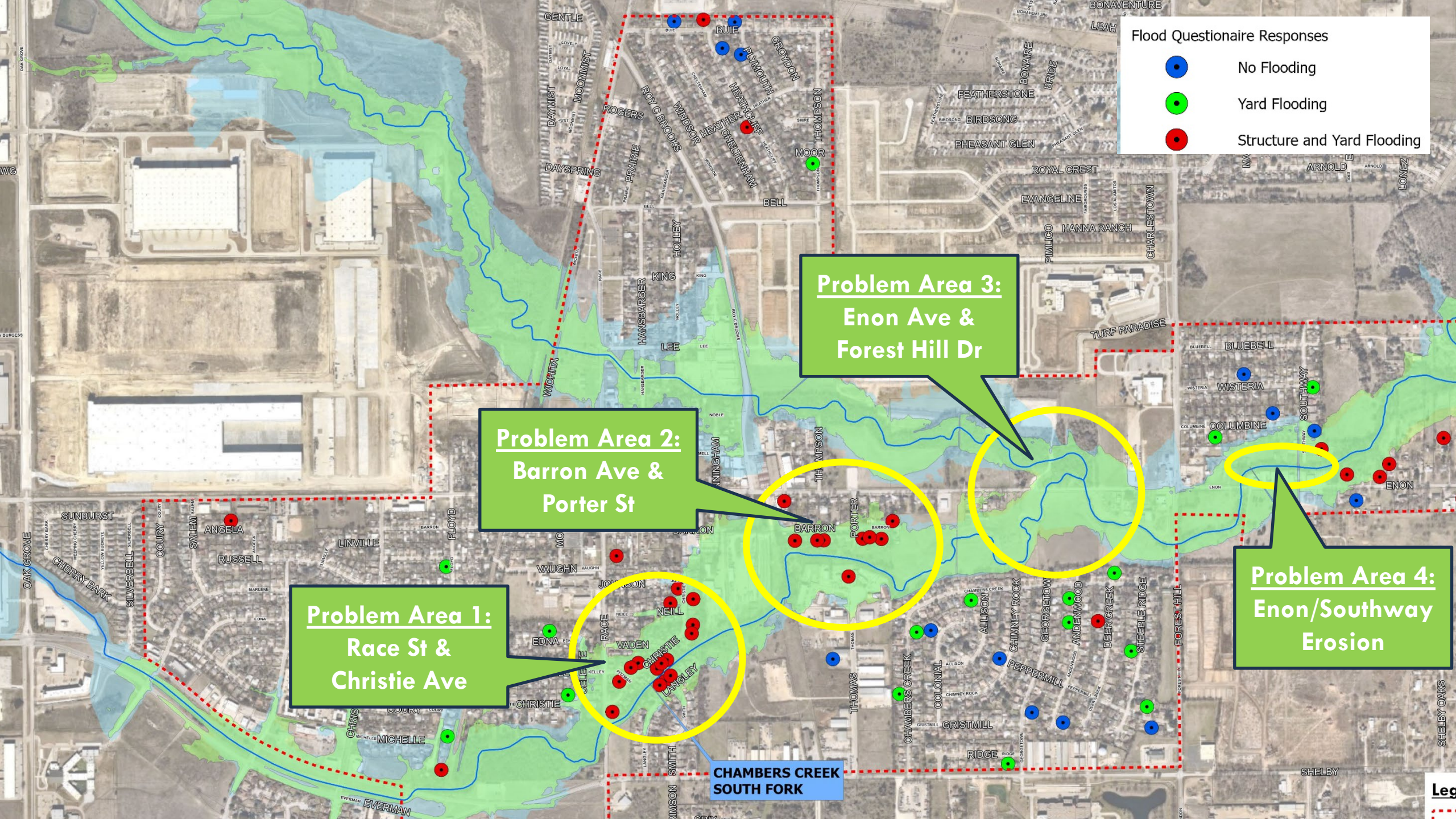
14 additional properties shown in updated floodplain

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 IDENTIFICATION

Flood Questionnaire Responses

- No Flooding
- Yard Flooding
- Structure and Yard Flooding



**Problem Area 2:
Barron Ave &
Porter St**

**Problem Area 3:
Enon Ave &
Forest Hill Dr**

**Problem Area 1:
Race St &
Christie Ave**

**Problem Area 4:
Enon/Southway
Erosion**

**CHAMBERS CREEK
SOUTH FORK**

Leg

SOLUTION ALTERNATIVE DEVELOPMENT

Problem Area 1: Race St. & Christie Ave.

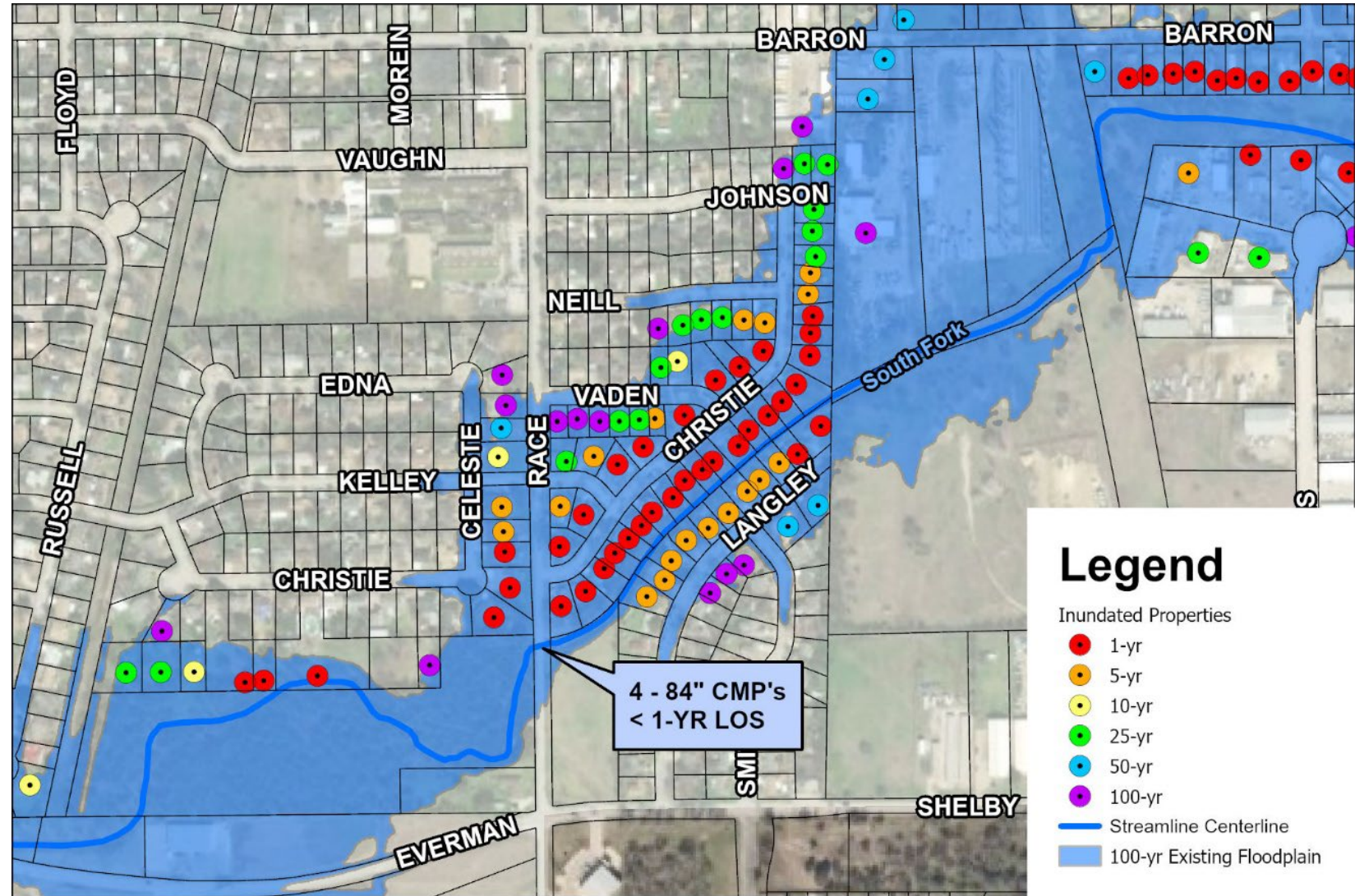
Existing Conditions

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.



Problem Area 1: Race St. & Christie Ave.

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

Gabion Walls



Data Collection

Public Involvement

Existing
Conditions
Modeling

Problem Area
Identification

Solution
Alternatives
Development

Report &
Presentation

Concrete Channel



Problem Area 1: Race St. & Christie Ave.

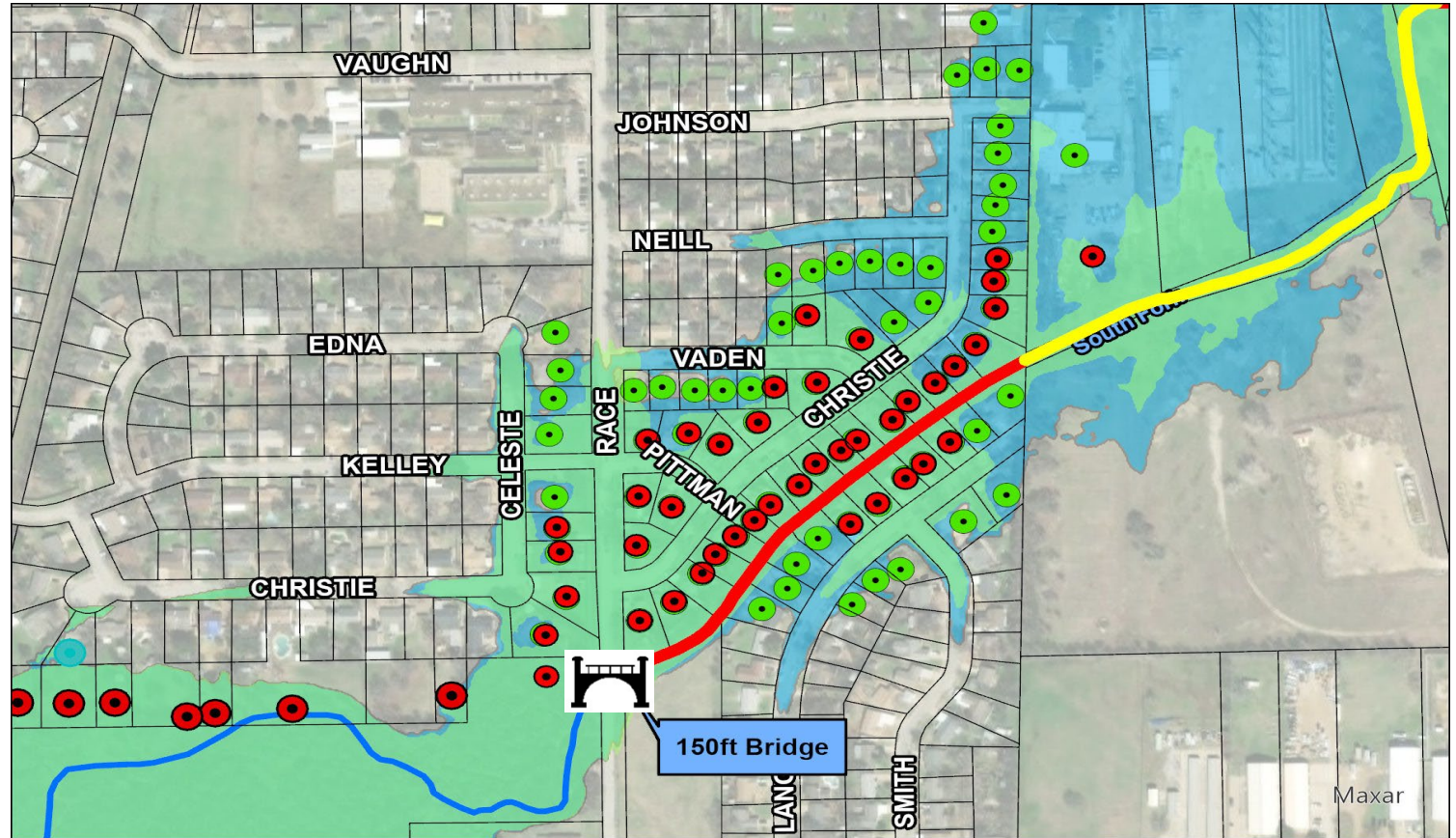
Alternate 1A

 Bridge

 Concrete Channel

 Downstream Grading

- Protects all homes from 10-year event.
- Removes 40 homes from 100-year floodplain



Problem Area 1: Race St. & Christie Ave.

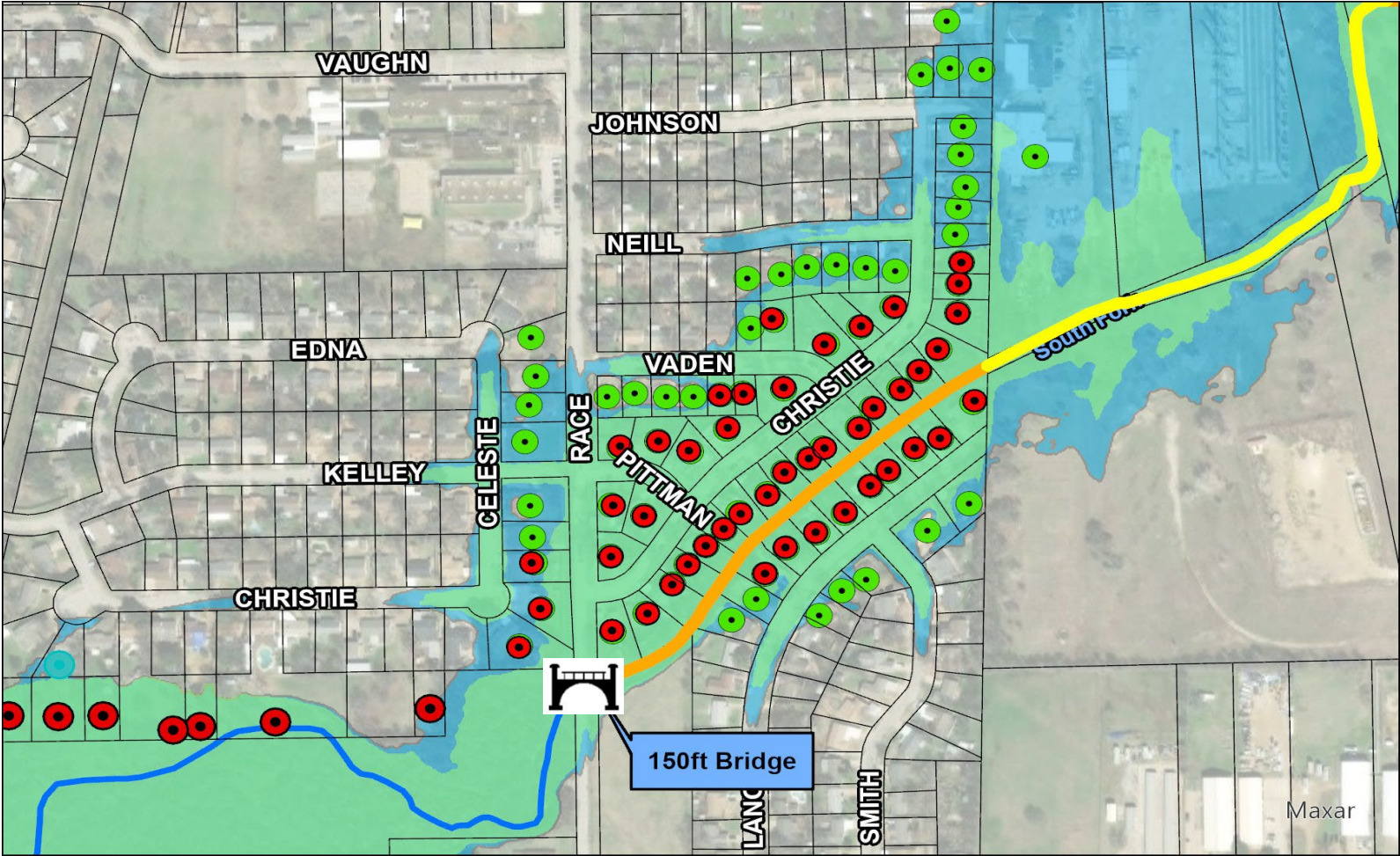
Alternate 1B

 Bridge

 Gabion Channel

 Downstream Grading

- Protects all homes from 5-year event
- Removes 36 homes from 100-year floodplain



Problem Area 1: Race St. & Christie Ave.

Alternate 1C



Bridge



Earthen Channel

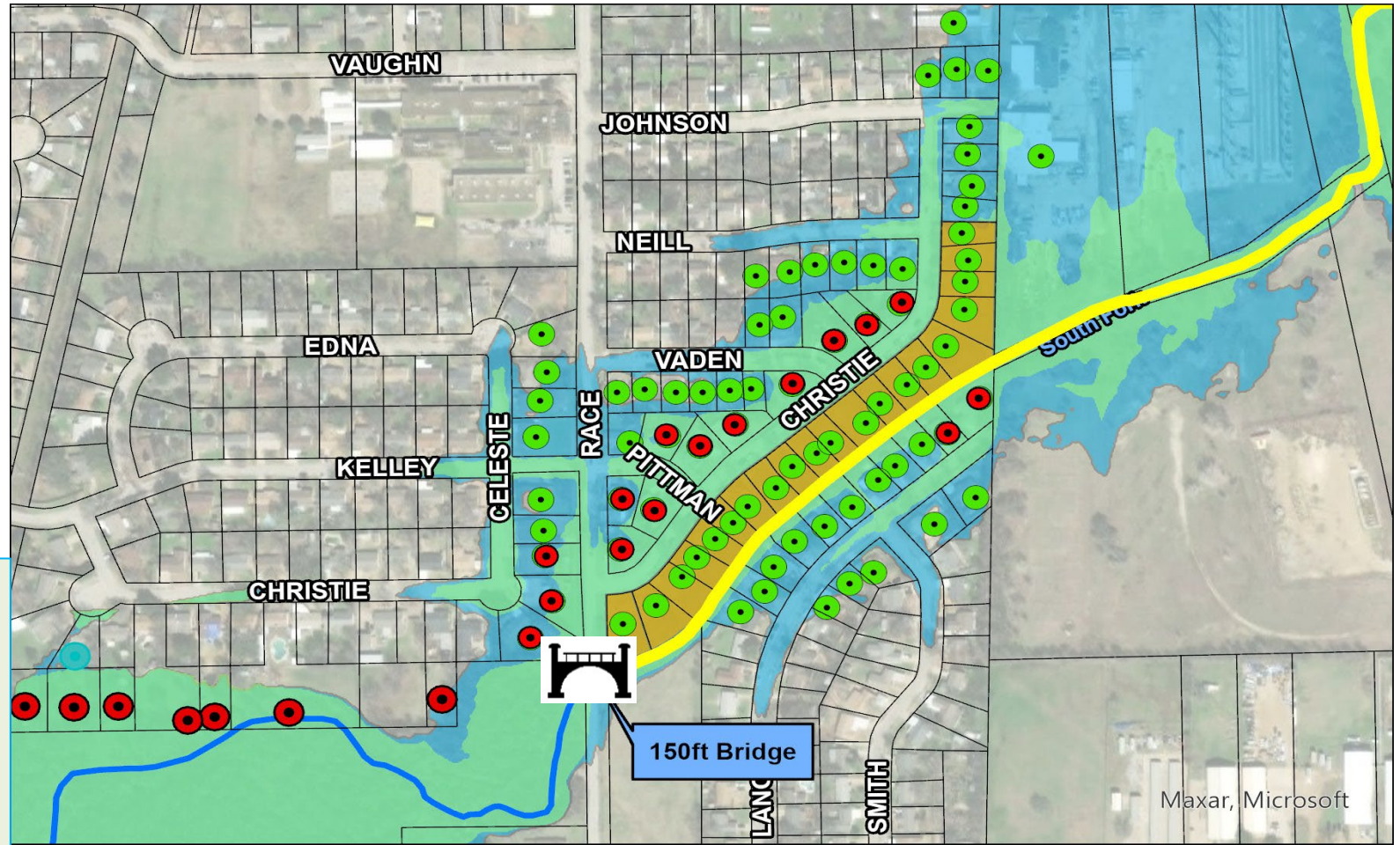


Home Buyouts



Downstream Grading

- Protects all homes from 25-year event.
- Removes 66 homes from 100-year floodplain



Problem Area 1: Race St. & Christie Ave.

Alternate 1D



Bridge



Concrete Channel

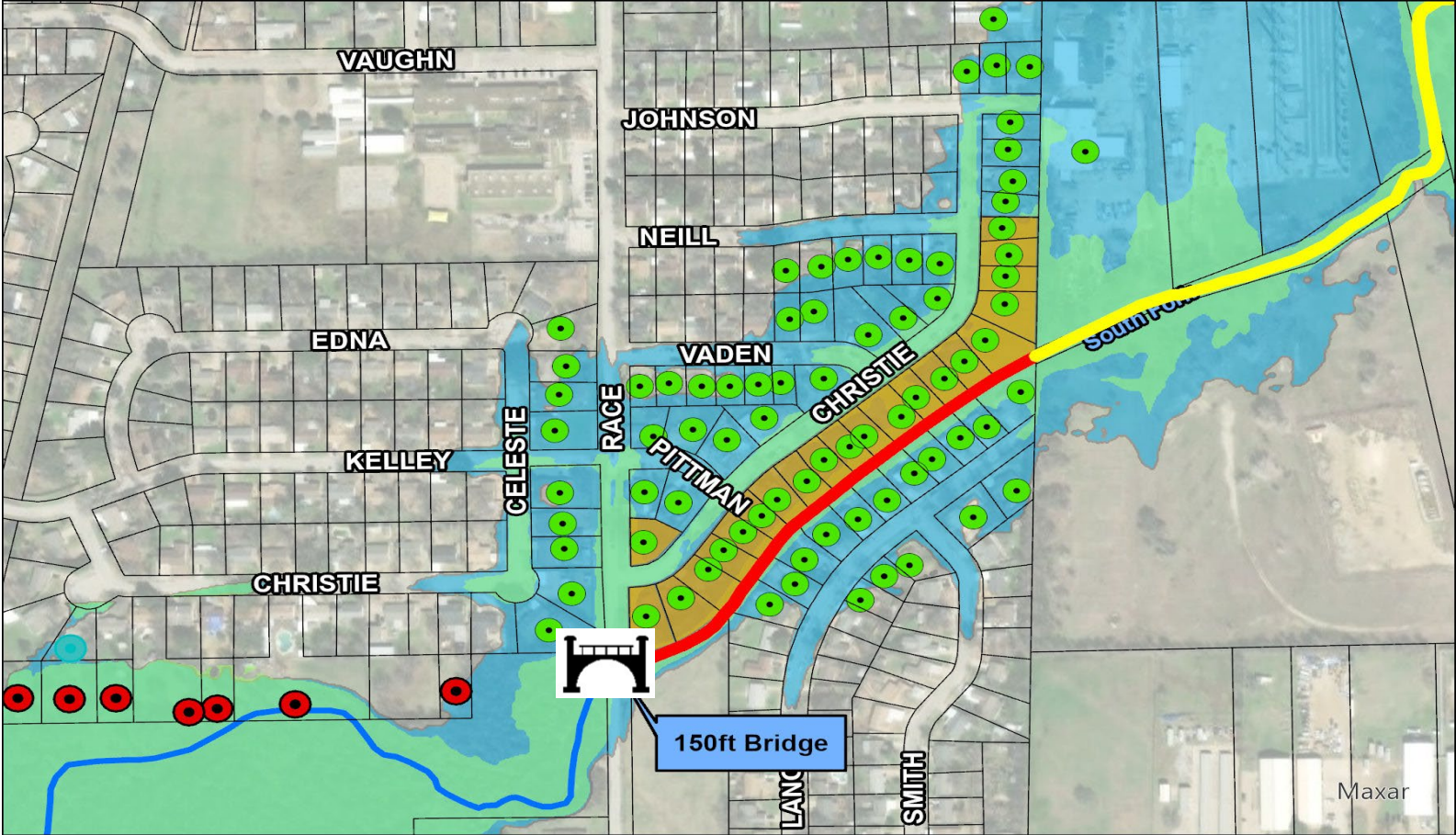


Home Buyouts



Downstream Grading

- Protects all homes from 100-year event.



Problem Area 1: Race St. & Christie Ave.

Alternate Comparison

	1A	1B	1C	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

Problem Area 2: Barron Ave. & Porter St.

Existing Conditions

Earthen/Natural Channel

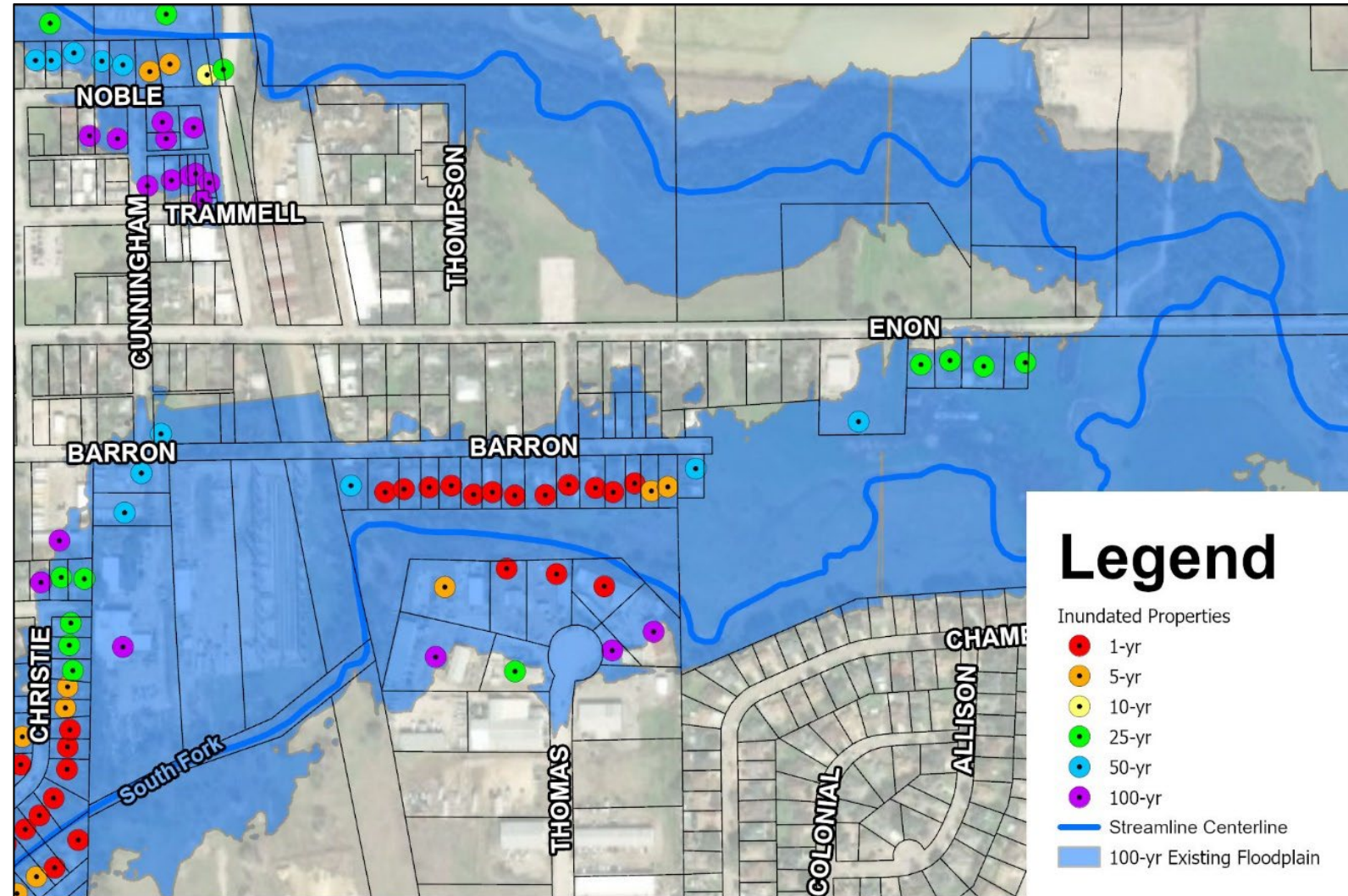
Properties Inundated By:

1-year event 15

5-year event 18

25-year event 19

100-year event 26

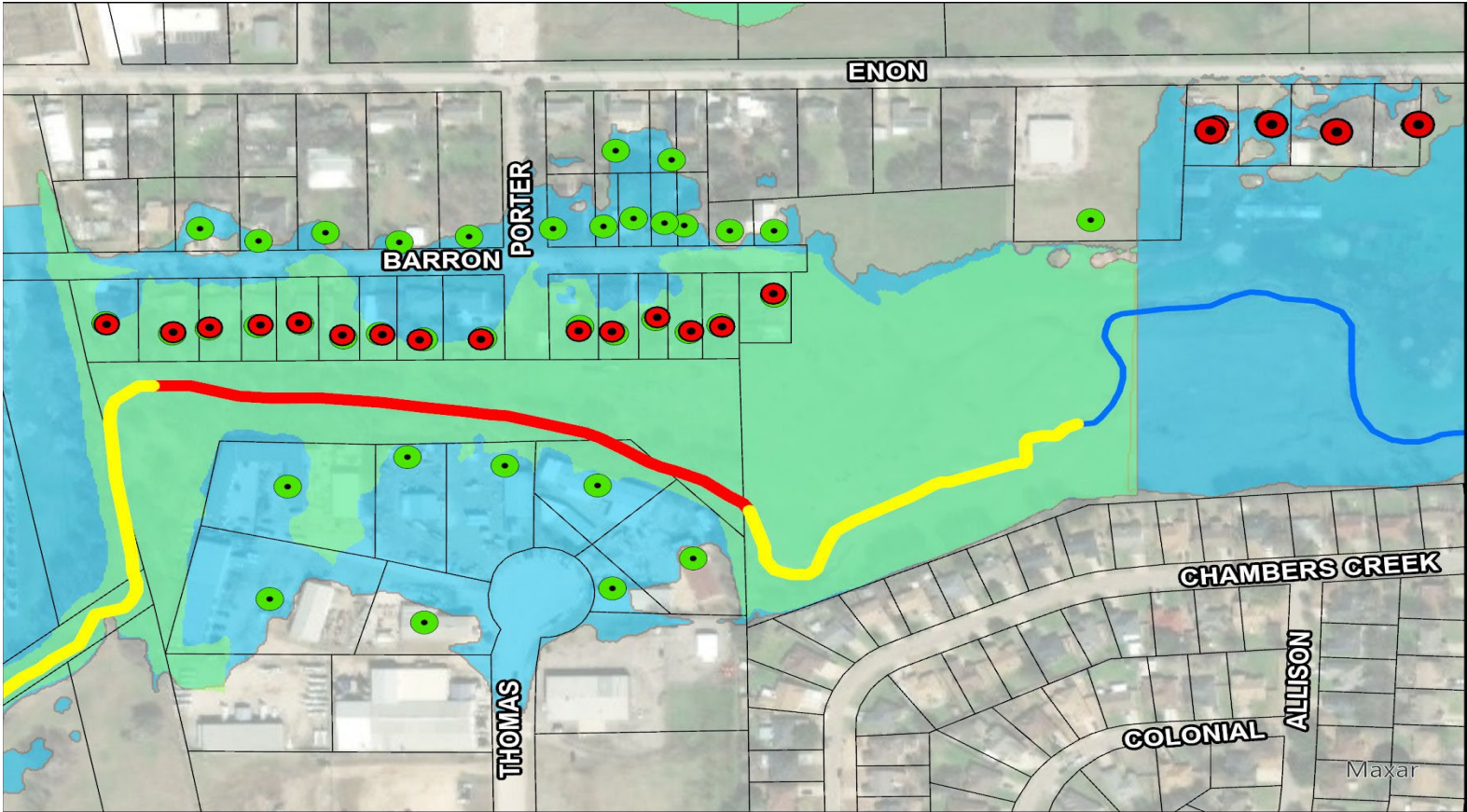


Problem Area 2: Barron Ave. & Porter St.

Alternate 2A

- Concrete Channel
- Downstream Grading

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

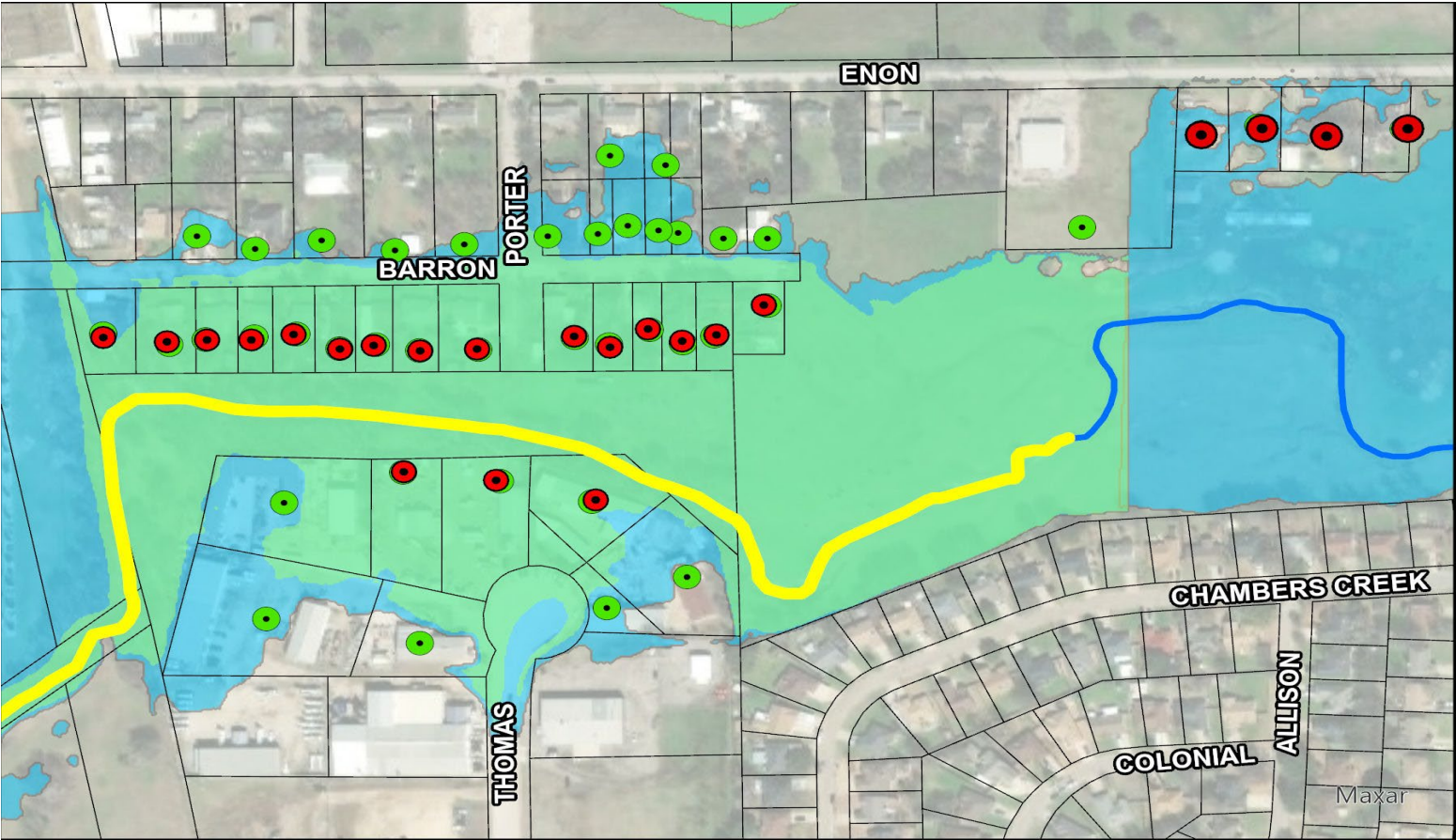


Problem Area 2: Barron Ave. & Porter St.

Alternate 2B

— Earthen Channel

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

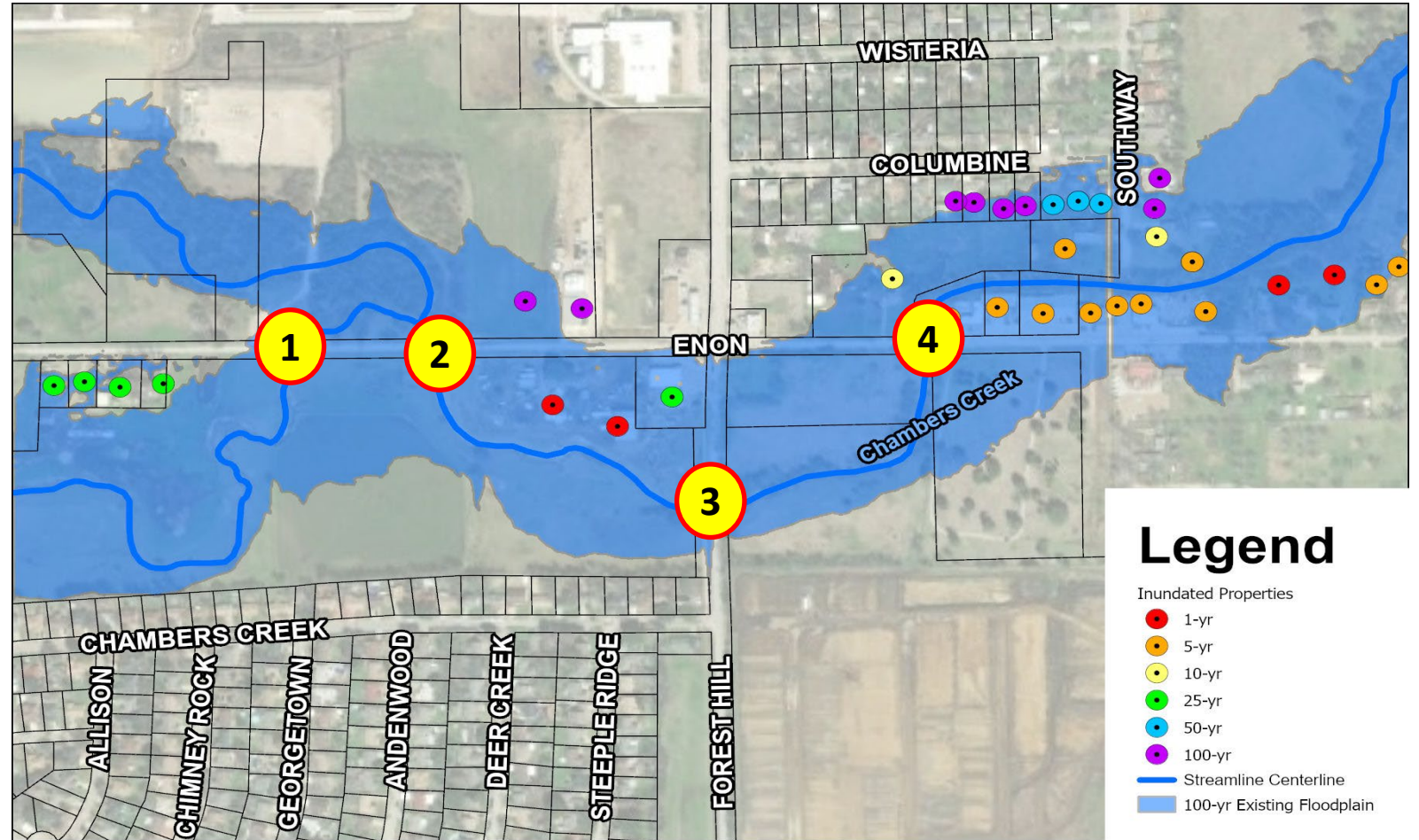
Problem Area 3: E. Enon Ave. & Forest Hill Dr.

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

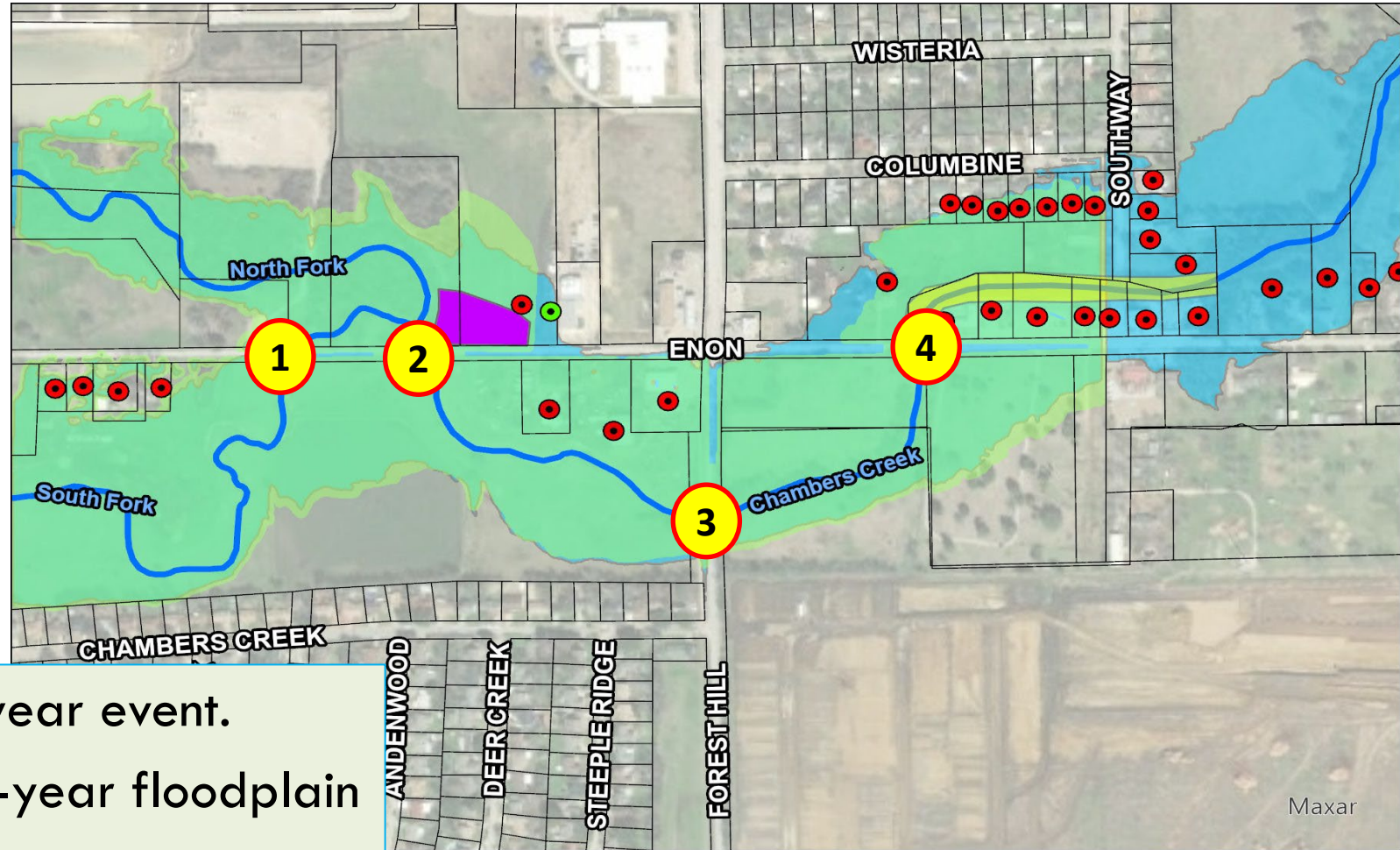


Bridges Level of Service less than 1-year event.

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

Improvements

- 1 100-ft Bridge
- 2 200-ft Bridge
- 3 300-ft Bridge
- 4 10 -10' x 10' Culverts
-  Gabion Channel/Wall



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

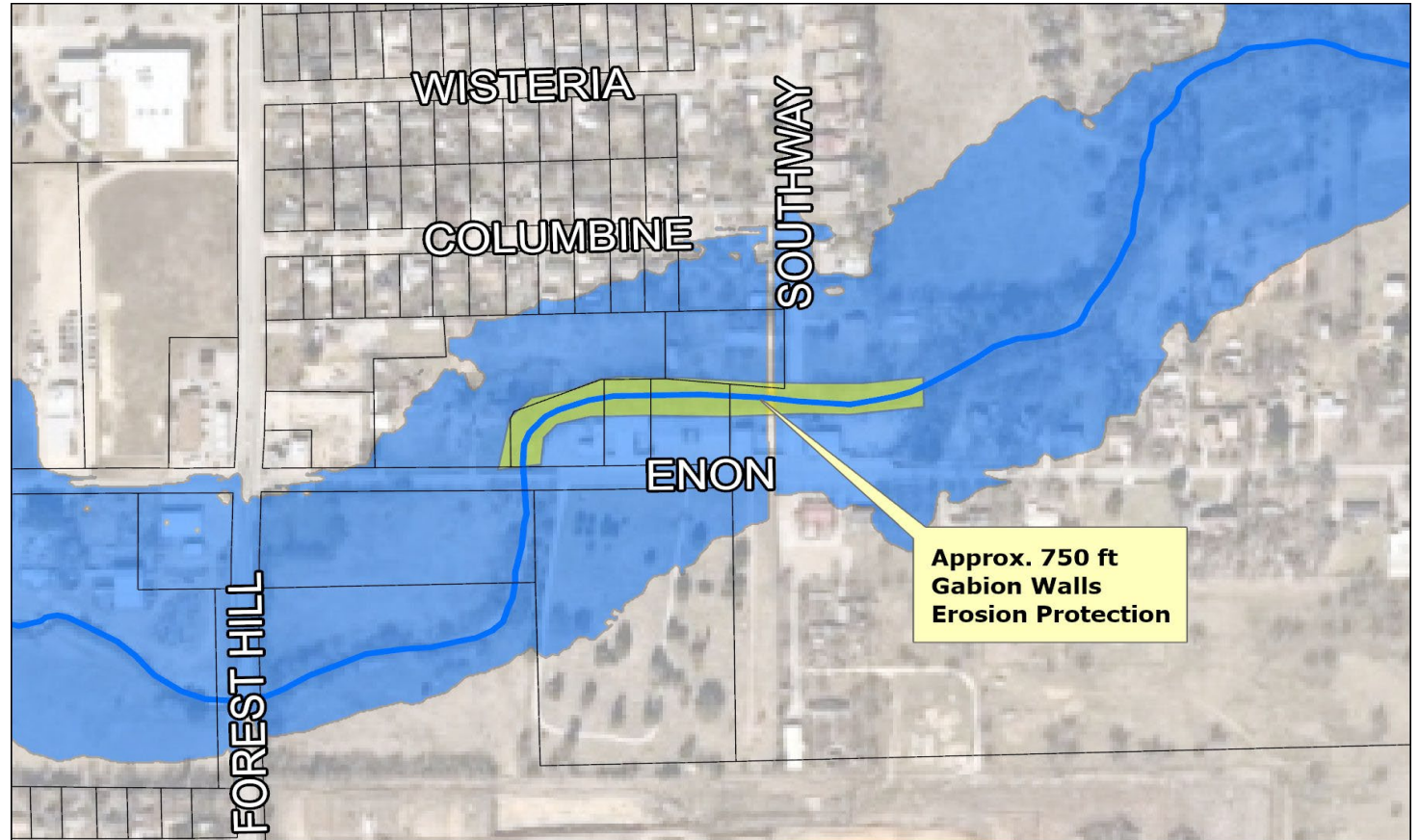
Cost Estimate: \$13.2M

Problem Area 4: Enon Ave. & Southway Erosion

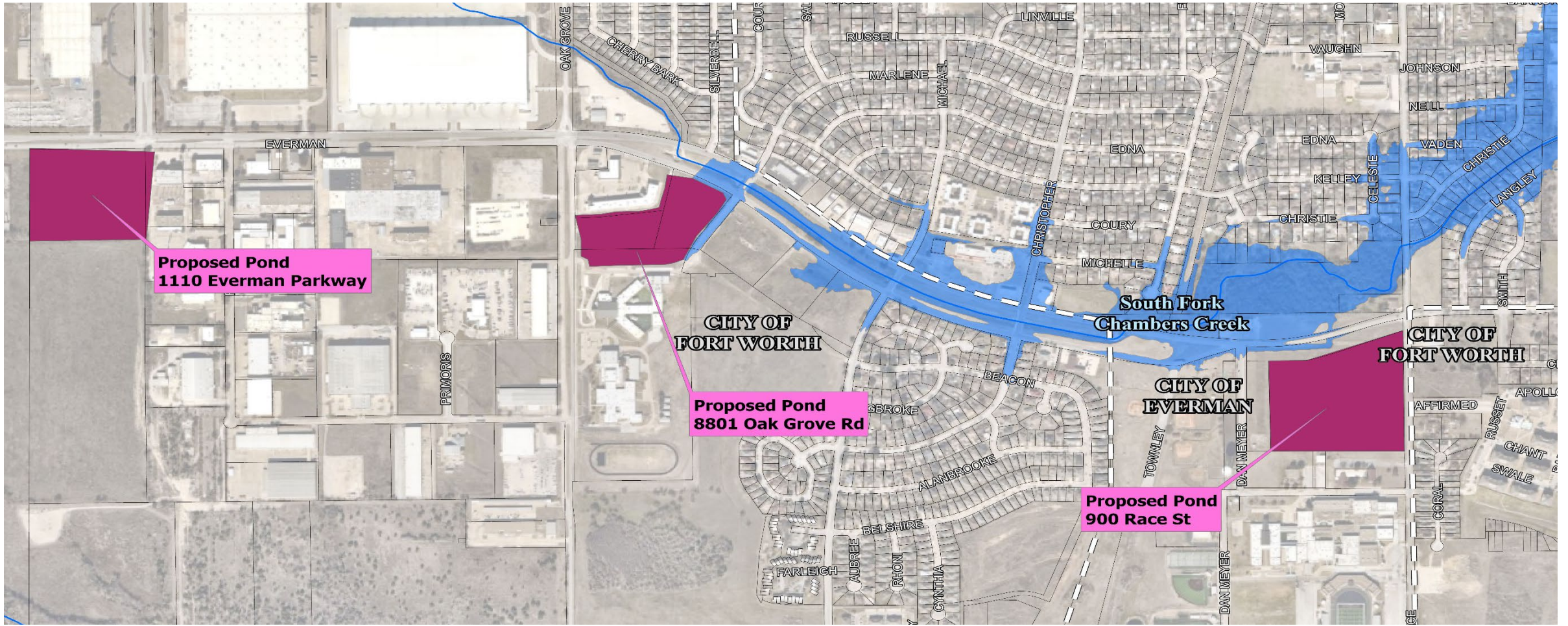


Part of Problem Area 3
Improvements.

Cost Estimate: \$2.7M



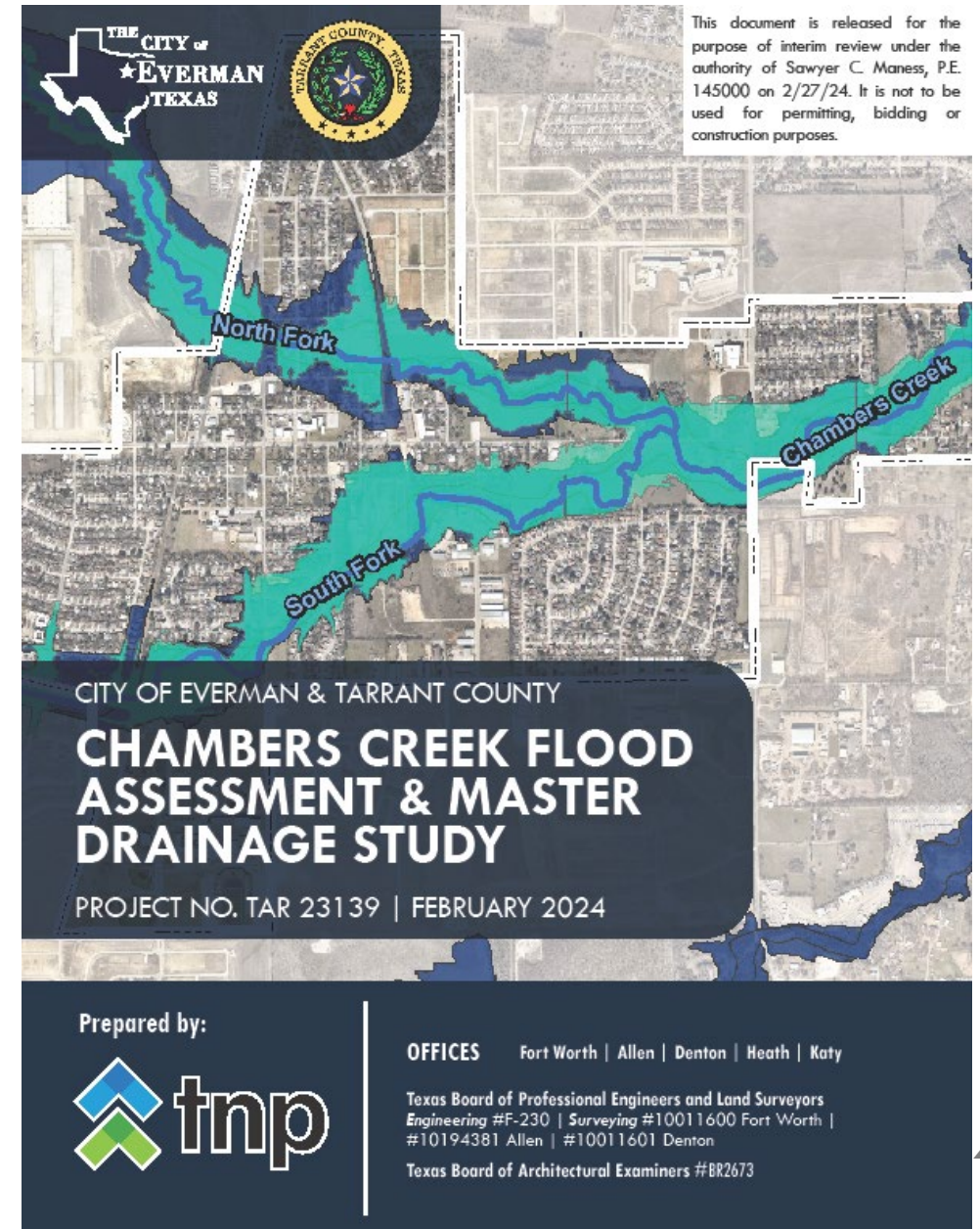
Regional Detention Evaluation



REPORT & PRESENTATION

Final Report

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



Recommendations

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

Race St. & Christie Ave. Phasing Example:

Buyouts

Channel
Improvements

Bridge

Next Steps

- 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

- Bonds
- Grants
 - Texas Water Development Board (TWDB)
 - FEMA
 - 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:
 - Residential: Flat rate per home – Current average is \$7
 - Commercial: Based on impervious cover – buildings/parking

Can be used for:

- Projects
- Staff
- Maintenance
- Environmental Permitting
- Debt Service

Letter of Map Revision (LOMR)

Official Change to the FEMA Flood Maps

PROS

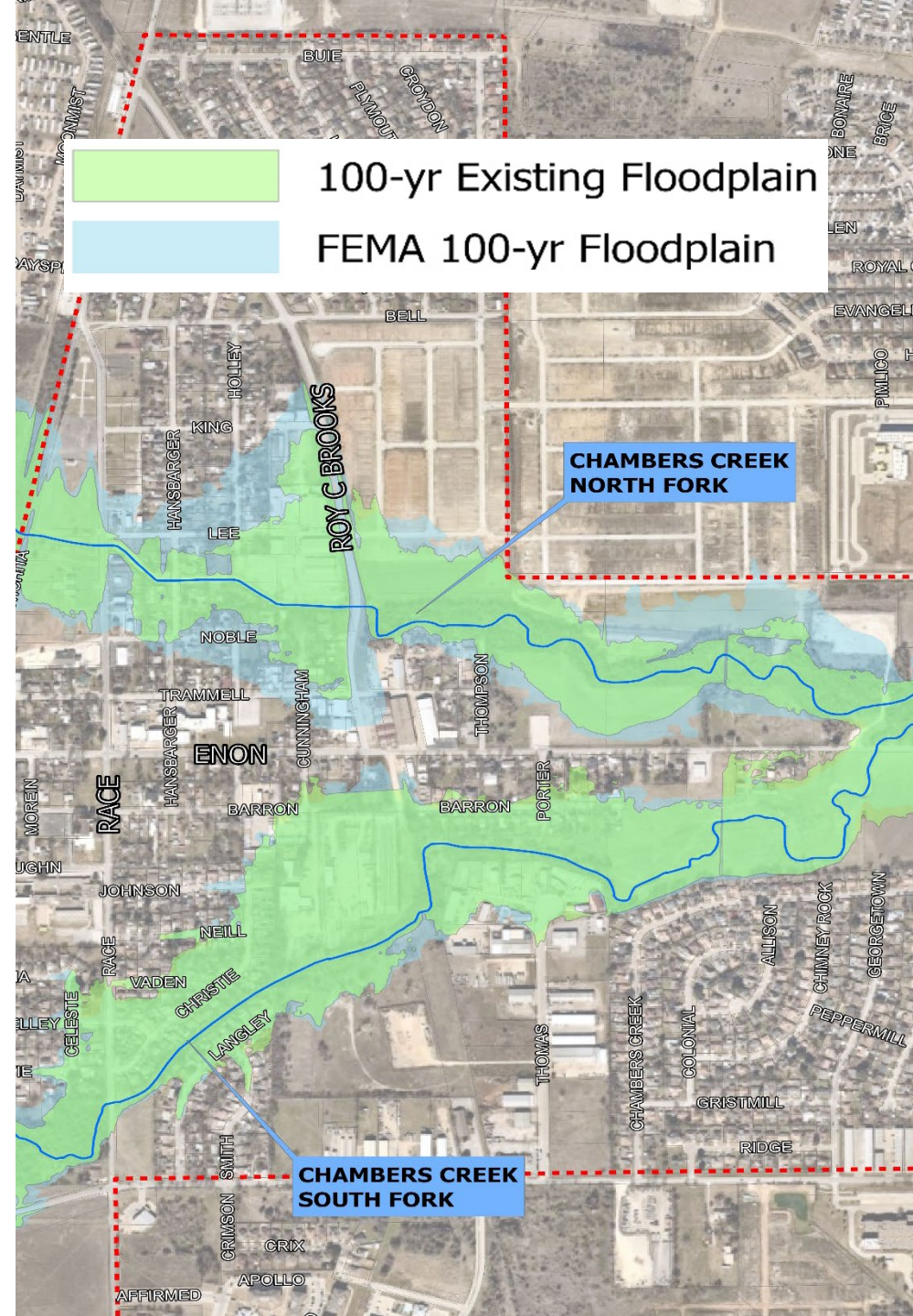
- Eliminates flood insurance requirement for those removed
- Single mapping source
- Properties within updated floodplain must purchase flood insurance

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

