

Farmers Branch Creek Study: Council Briefing

September 26, 2017



Study Objectives – Farmers Branch Creek

1. Determine flooding potential for road crossings and structures
2. Determine erosion risks to public and private infrastructure
3. Develop solutions to reduce flooding and erosion risks

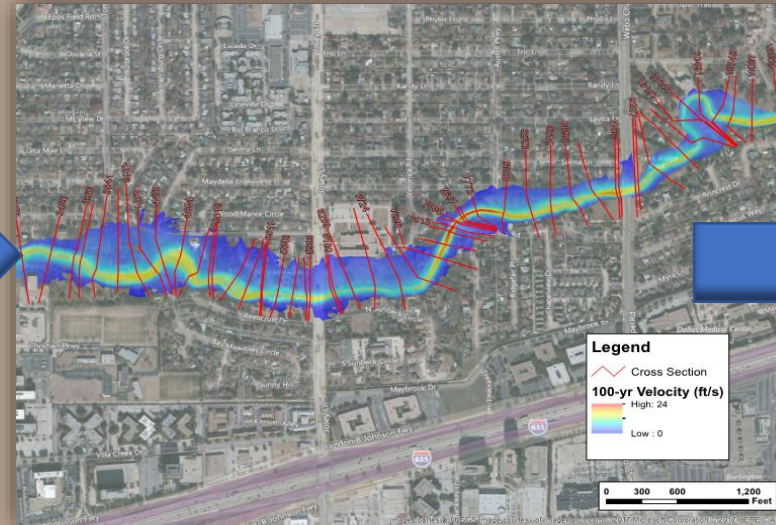
Study Progress

Field Work



- Creek Survey
- Geomorphic Site Visit
- Sedimentation Evaluation
- Dam Assessment

Desktop Analysis



- GIS Workmaps
- Hydrologic/Hydraulic Analysis
- Existing Conditions Report
- Preliminary Alternatives Analysis

Public Involvement



- Project Website
- Stormwater Committee
- Public Meeting – June 28, 2017
- Resident Feedback Survey

Public Feedback



Farmers Branch Creek Watershed Study Existing Conditions and Conceptual Solutions



June 28, 2017



Farmers Branch Creek Study

June 28, 2017 Community Meeting



Name (optional): _____

Address (optional): _____

1. How important is it to you to address flooding issues (i.e. roadway overtopping, flooded homes, flooded yards) on Farmers Branch Creek?

Very Unimportant	Unimportant	Somewhat Important	Important	Very Important
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. How important is it to you to address erosion issues (i.e. exposed sewer lines, undermined creek bank walls, eroded yards, threatened buildings) on Farmers Branch Creek?

Very Unimportant	Unimportant	Somewhat Important	Important	Very Important
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Are you open to the creek flooding and erosion solutions being considered in this study? Yes No

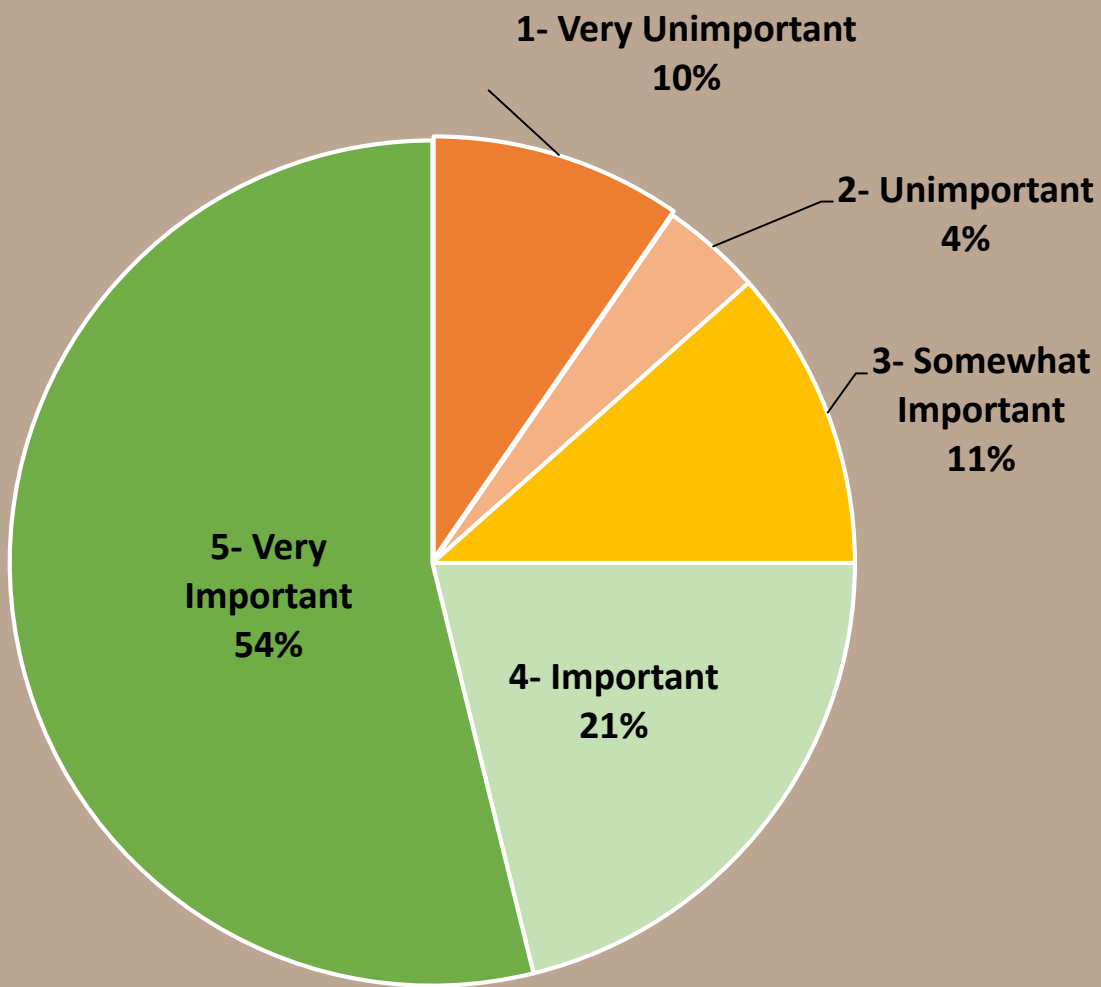
4. Are you open to providing City easements on your property for creek improvements and/or maintenance? Yes No

5. Are you open to modifications to creek structures on your property? Yes No

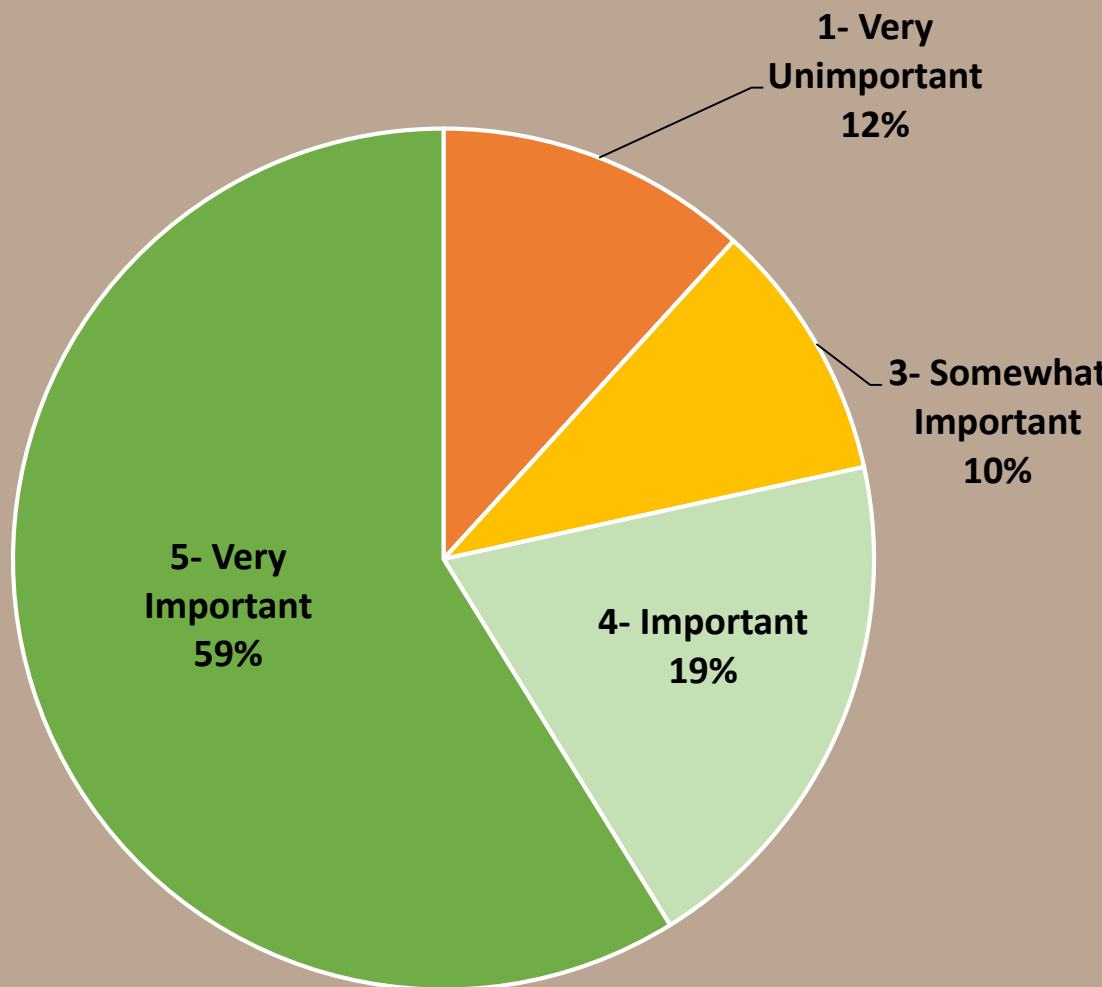
6. If you placed a numbered dot on the maps, please list the number here: _____

Comments (related to above responses and/or map notation):

How important is it to you to address flooding issues on Farmers Branch Creek?

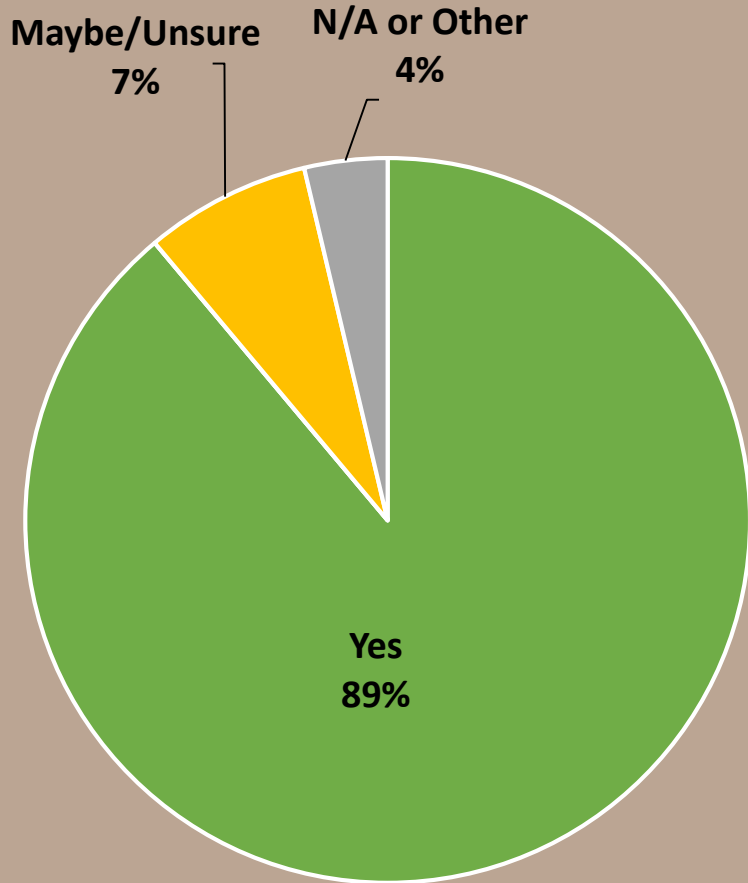


How important is it to you to address erosion issues on Farmers Branch Creek?

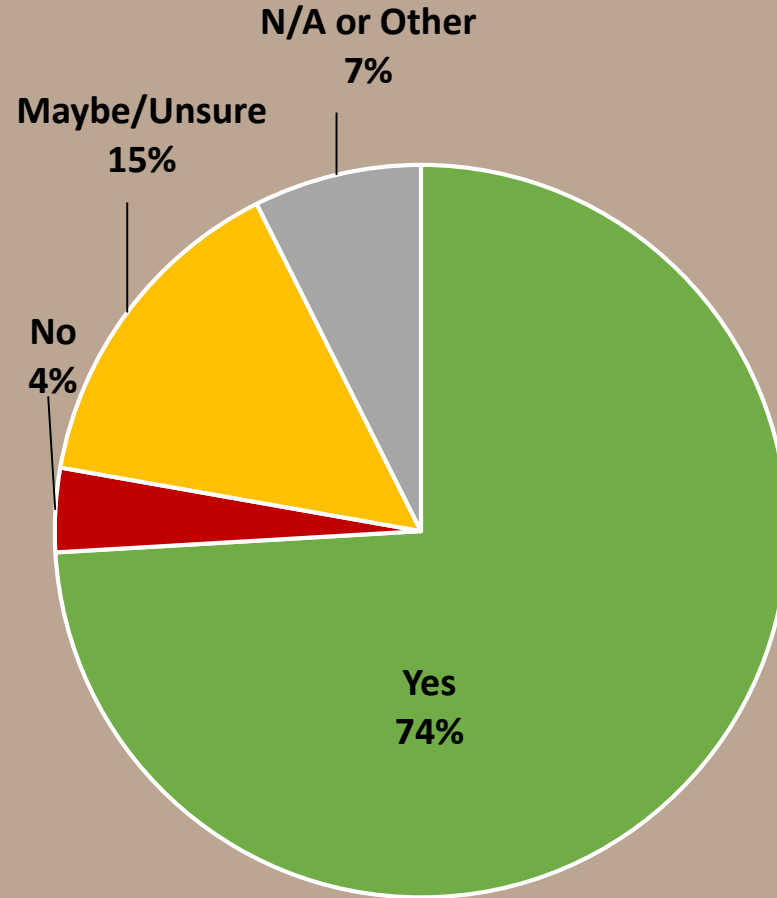


❖ May be some confusion with the rating scale; many respondents who indicated that erosion is unimportant noted erosion problems in their comments.

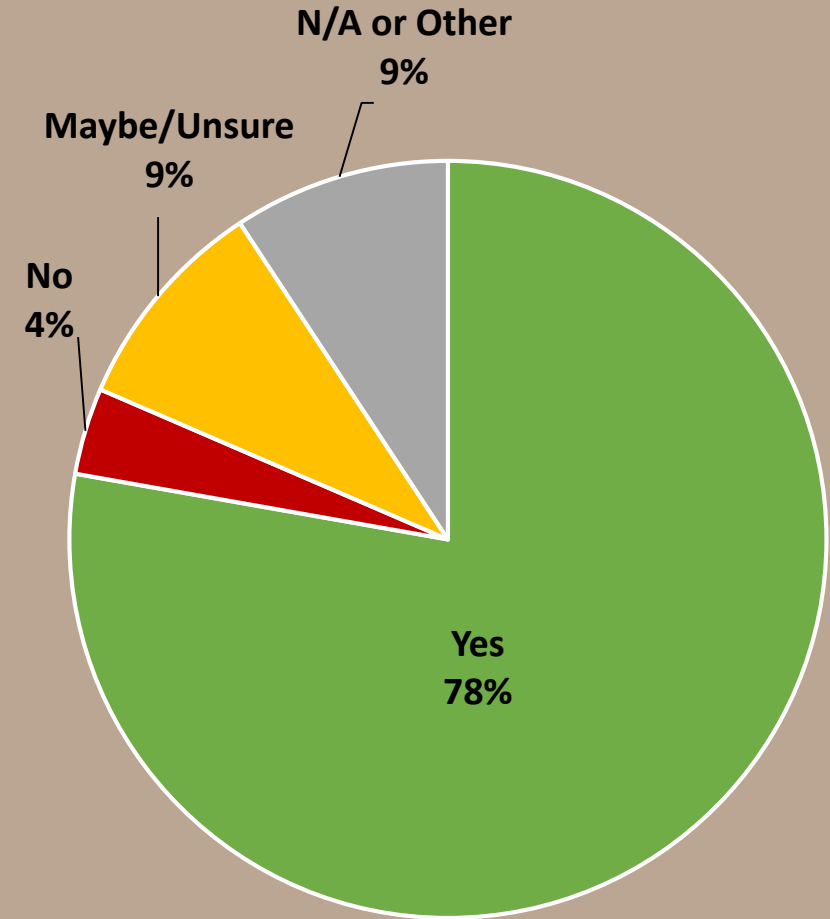
Are you open to creek flooding and erosion solutions being considered in this study?



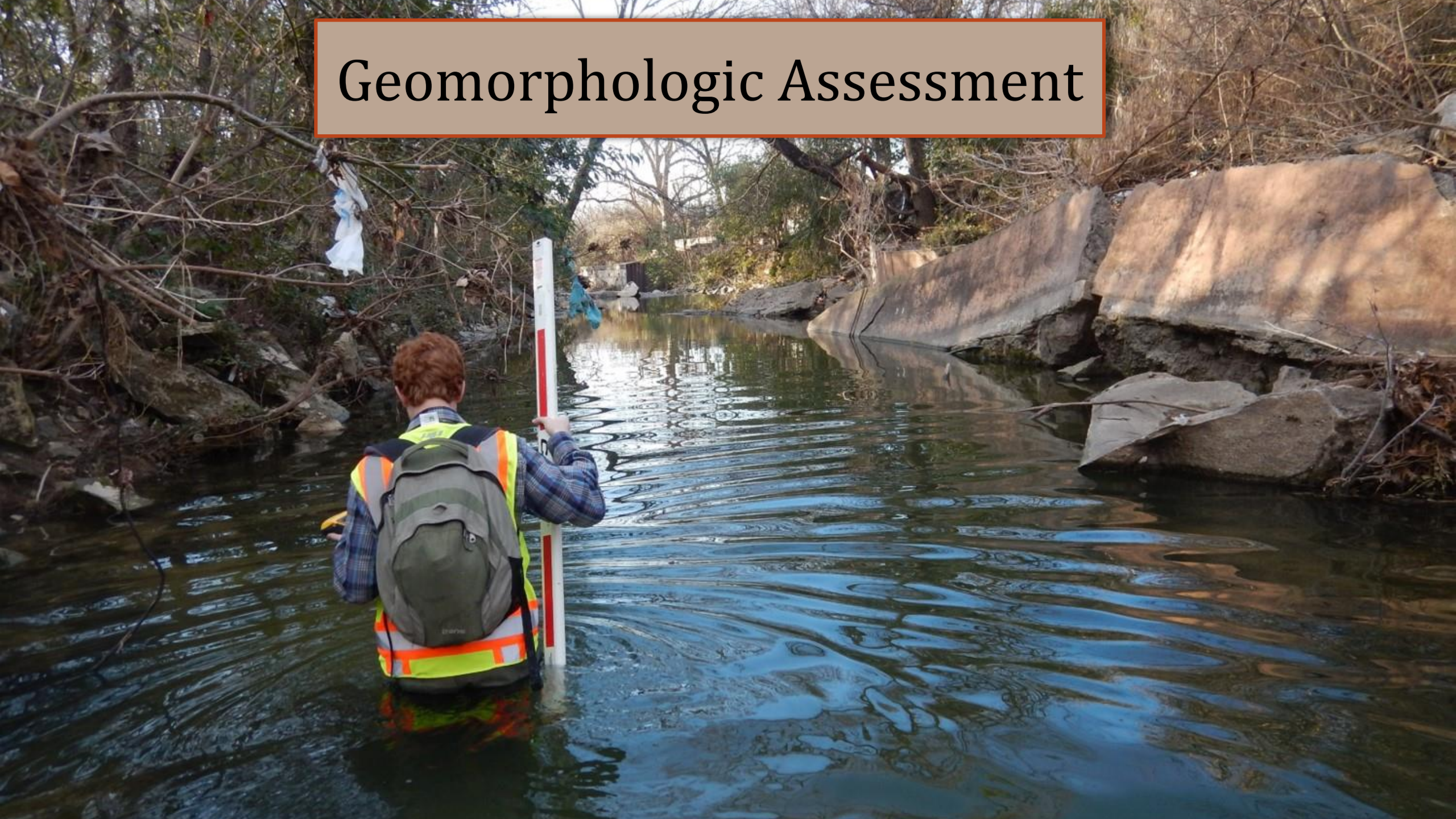
Are you open to modifications to creek structures on your property?



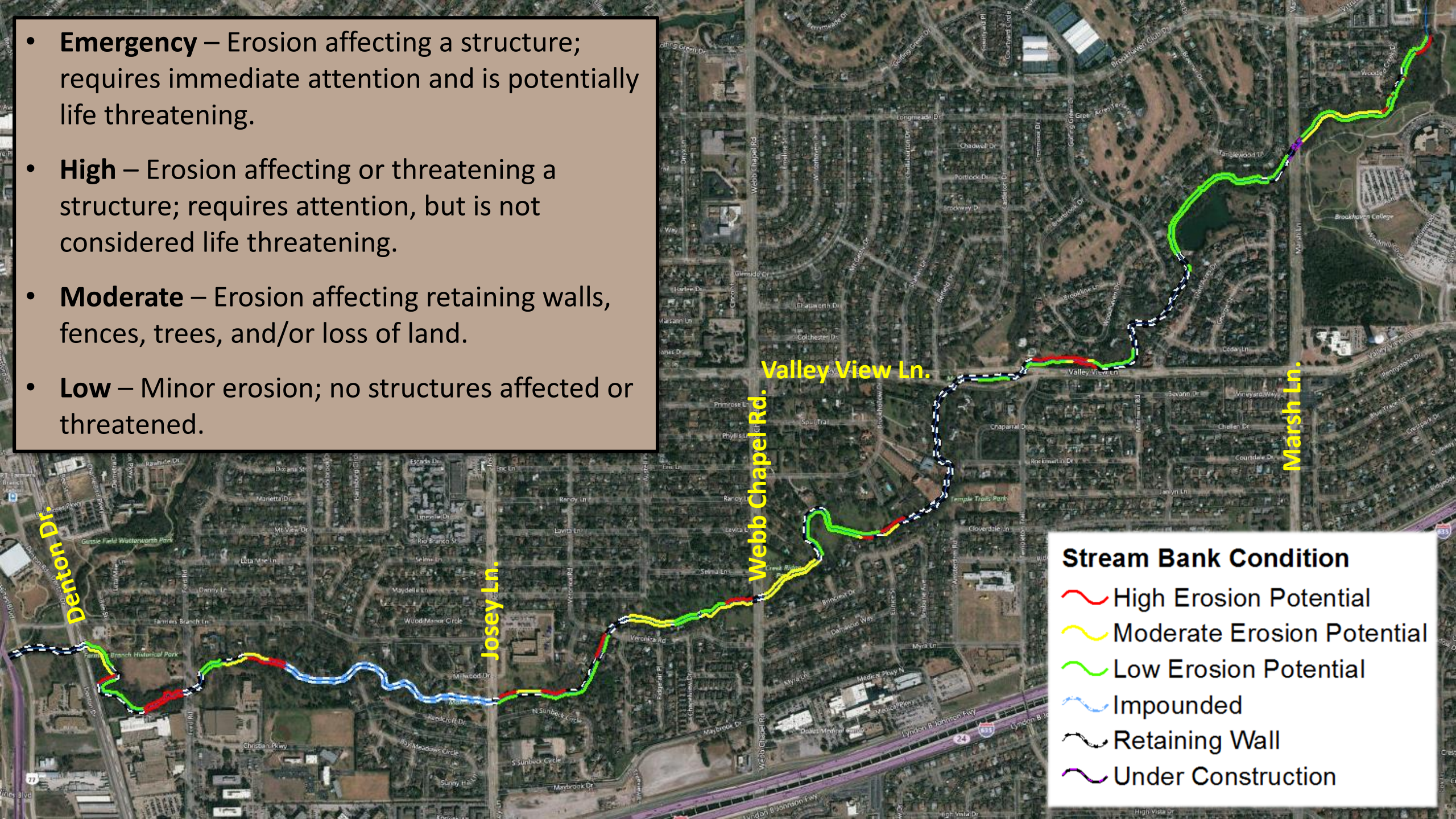
Are you open to providing City easements on your property for creek improvements and/or maintenance?



Geomorphologic Assessment



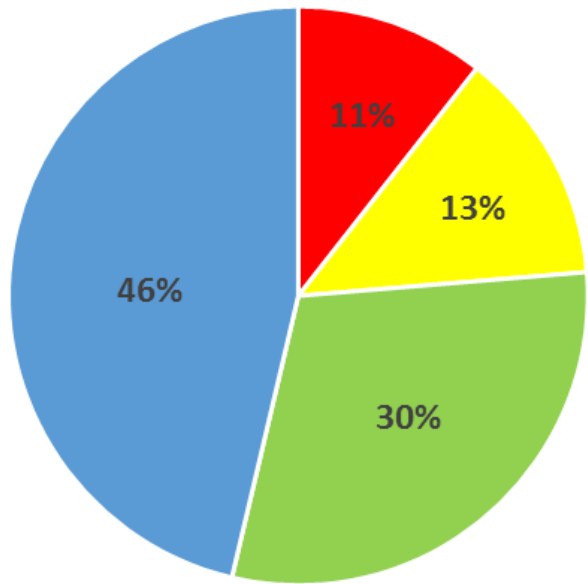
- **Emergency** – Erosion affecting a structure; requires immediate attention and is potentially life threatening.
- **High** – Erosion affecting or threatening a structure; requires attention, but is not considered life threatening.
- **Moderate** – Erosion affecting retaining walls, fences, trees, and/or loss of land.
- **Low** – Minor erosion; no structures affected or threatened.



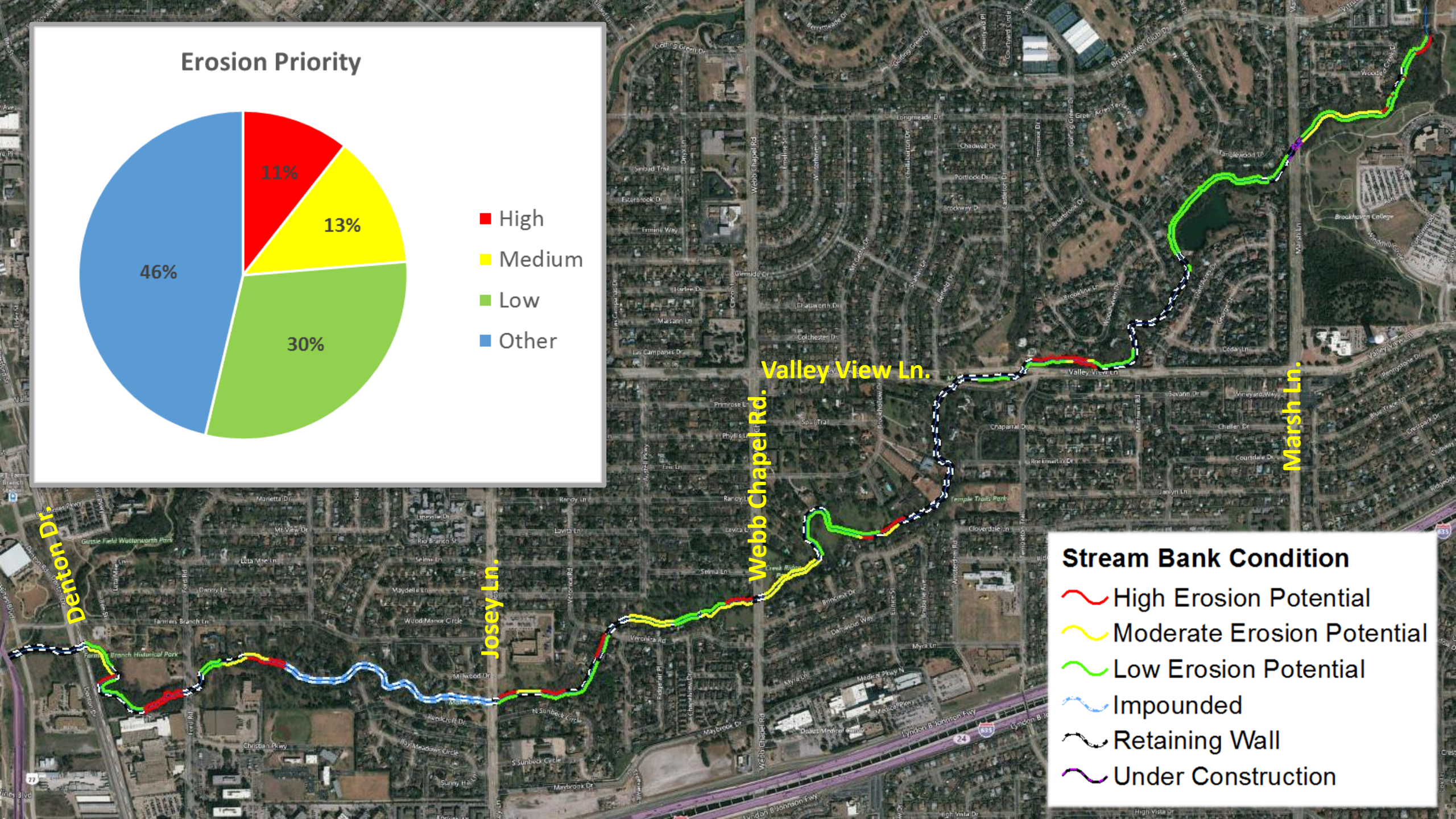
Stream Bank Condition

- High Erosion Potential
- Moderate Erosion Potential
- Low Erosion Potential
- Impounded
- Retaining Wall
- Under Construction

Erosion Priority



- High
- Medium
- Low
- Other



Stream Bank Condition

- High Erosion Potential
- Moderate Erosion Potential
- Low Erosion Potential
- Impounded
- Retaining Wall
- Under Construction

Erosion Summary

1. The team documented no “Emergency” repair areas requiring immediate attention.
2. Erosion is seen by residents as a higher priority than technically indicated.
3. Much of the creek is already hard armored or otherwise improved.
 - ❖ Impounded/improved areas have inherently less erosion risk.
4. Public infrastructure would benefit from general maintenance and minor repairs.



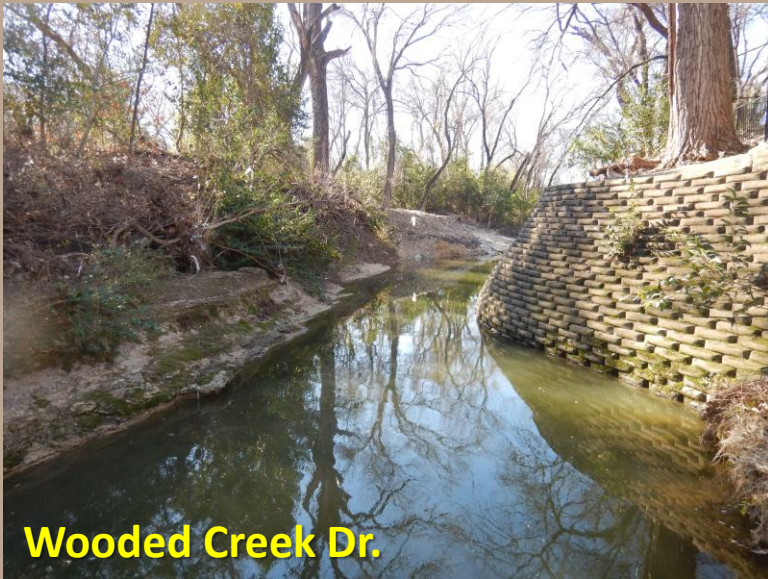
Downstream of Vitruvian Park

Public Infrastructure



Current Erosion Protection Measures

Bag Wall



Gabion Wall



Rip Rap Outfall Protection



Potential Erosion Protection Alternatives

Alternative A



**Stabilized Vegetated
Bank**

Alternative B



**Stabilized Vegetated
Bank with Rock Toe**

Alternative C



Gravity Wall

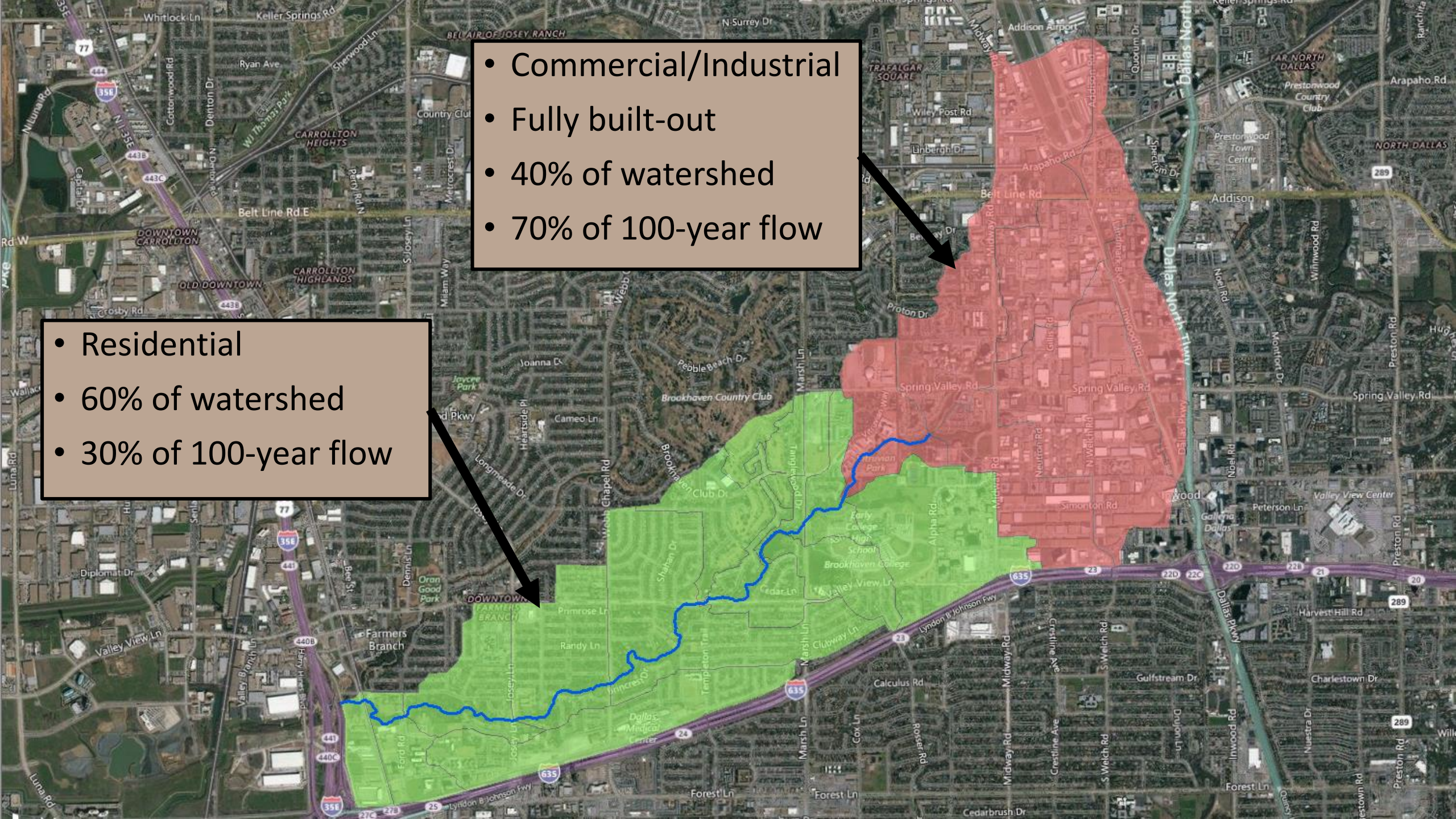
- ❖ Natural-looking solutions are generally preferred by residents, but may require loss of private land
- ❖ Many gravity wall solutions such as gabions and bag walls have been constructed along creek

Flood Risk Assessment



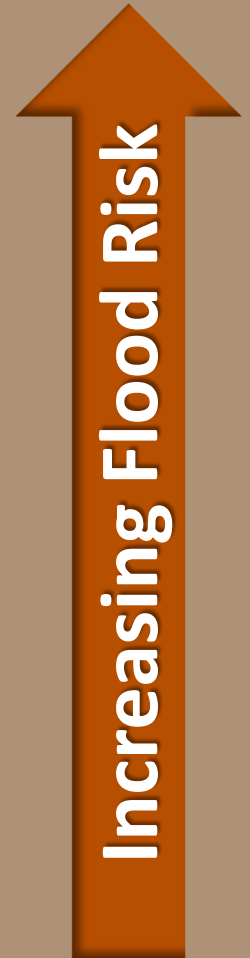
- Commercial/Industrial
- Fully built-out
- 40% of watershed
- 70% of 100-year flow

- Residential
- 60% of watershed
- 30% of 100-year flow



Flood Risk Assessment

Return Interval	Annual Risk of Flooding
5-year	20%
10-year	10%
25-year	4%
50-year	2%
100-year	1%



❖ A home in the 100-year floodplain has a 26% chance of flooding over a 30-year period.

Flood Risk – Bridges

**Marsh Lane SB
(out of service)**

**Marsh Lane NB
100-year**

**Valley View Lane WB
100-year**

**Valley View Lane EB
10-year**

**Denton Drive
50-year**

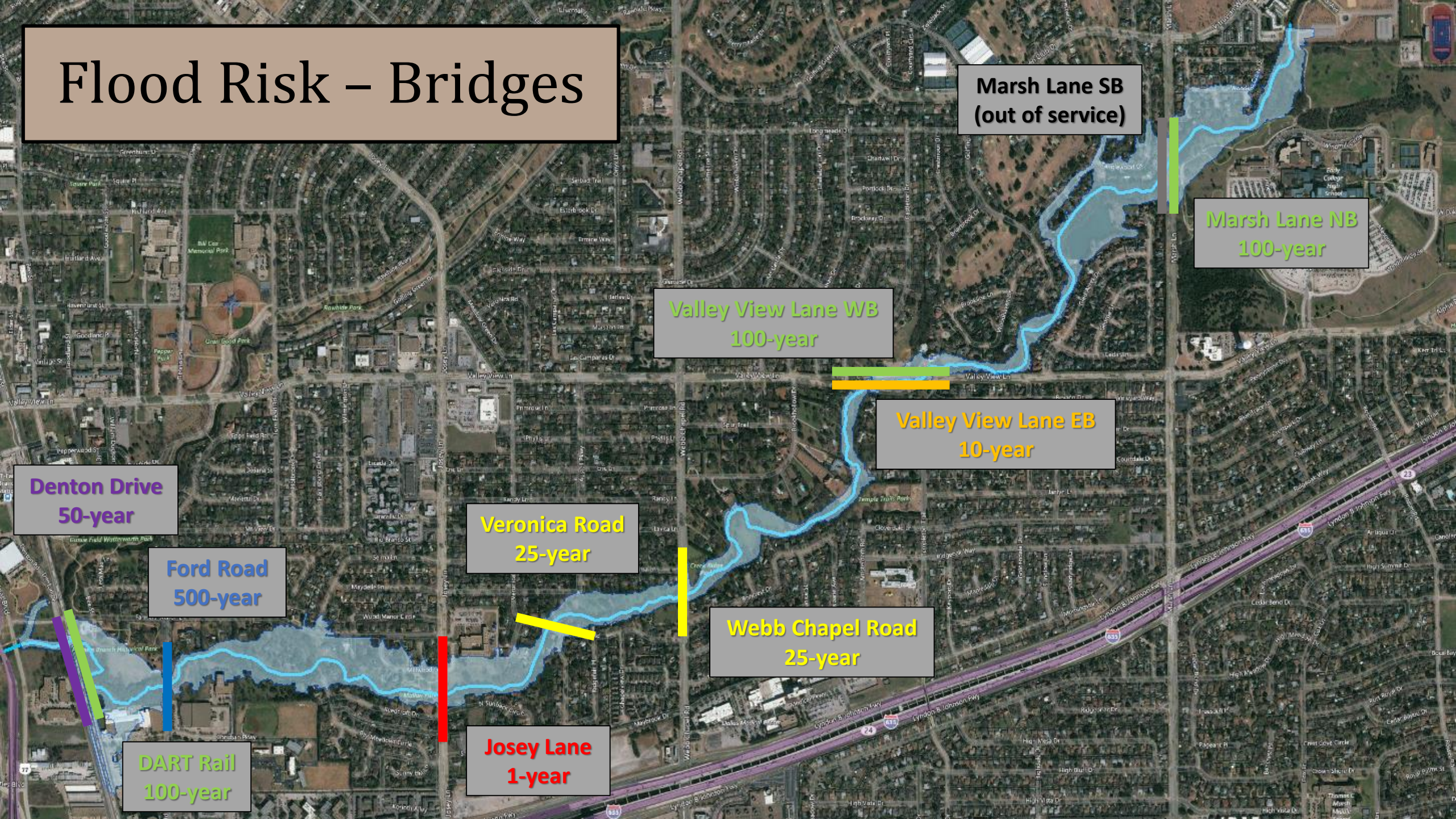
**Ford Road
500-year**

**Veronica Road
25-year**

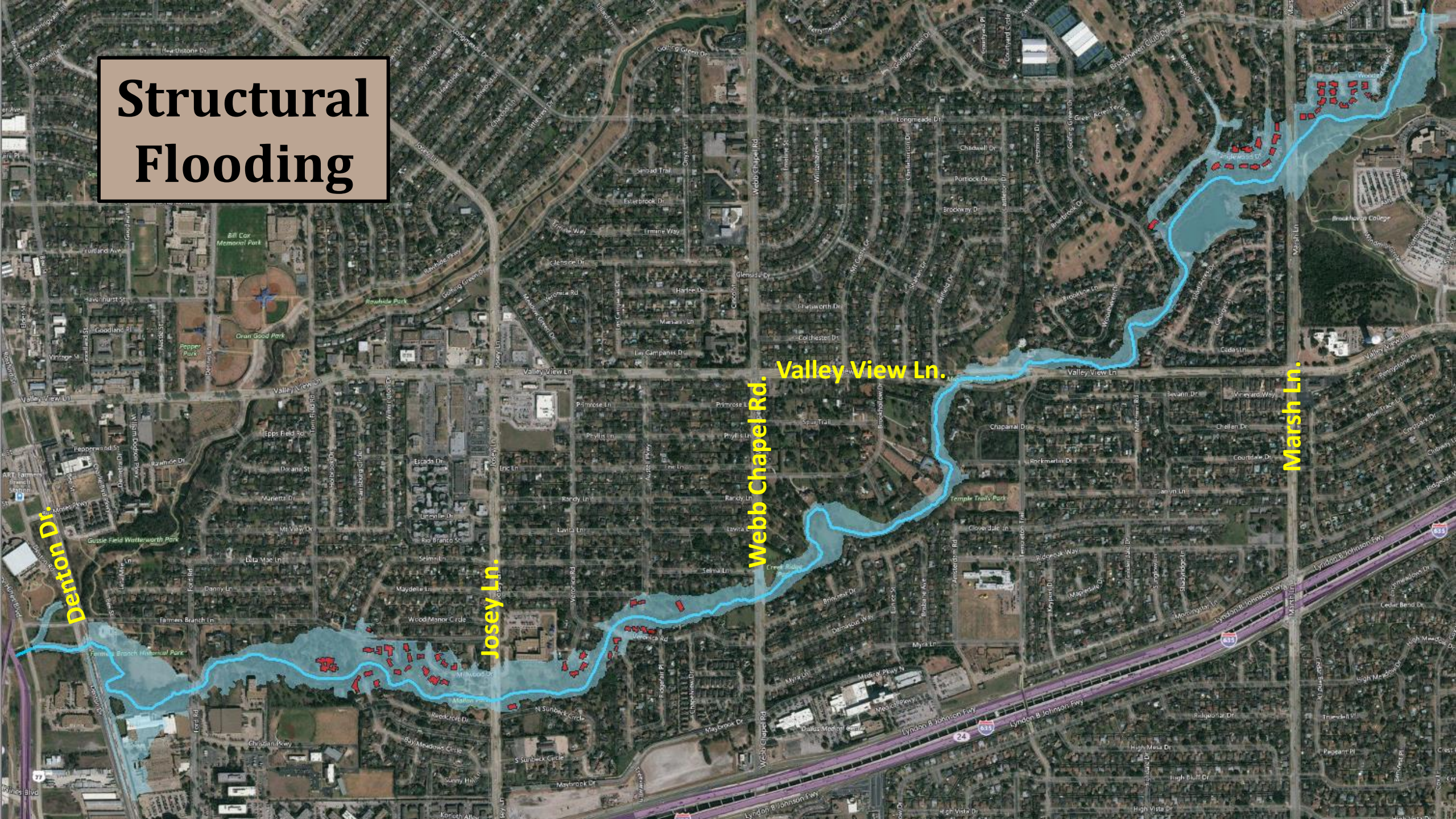
**Webb Chapel Road
25-year**

**DART Rail
100-year**

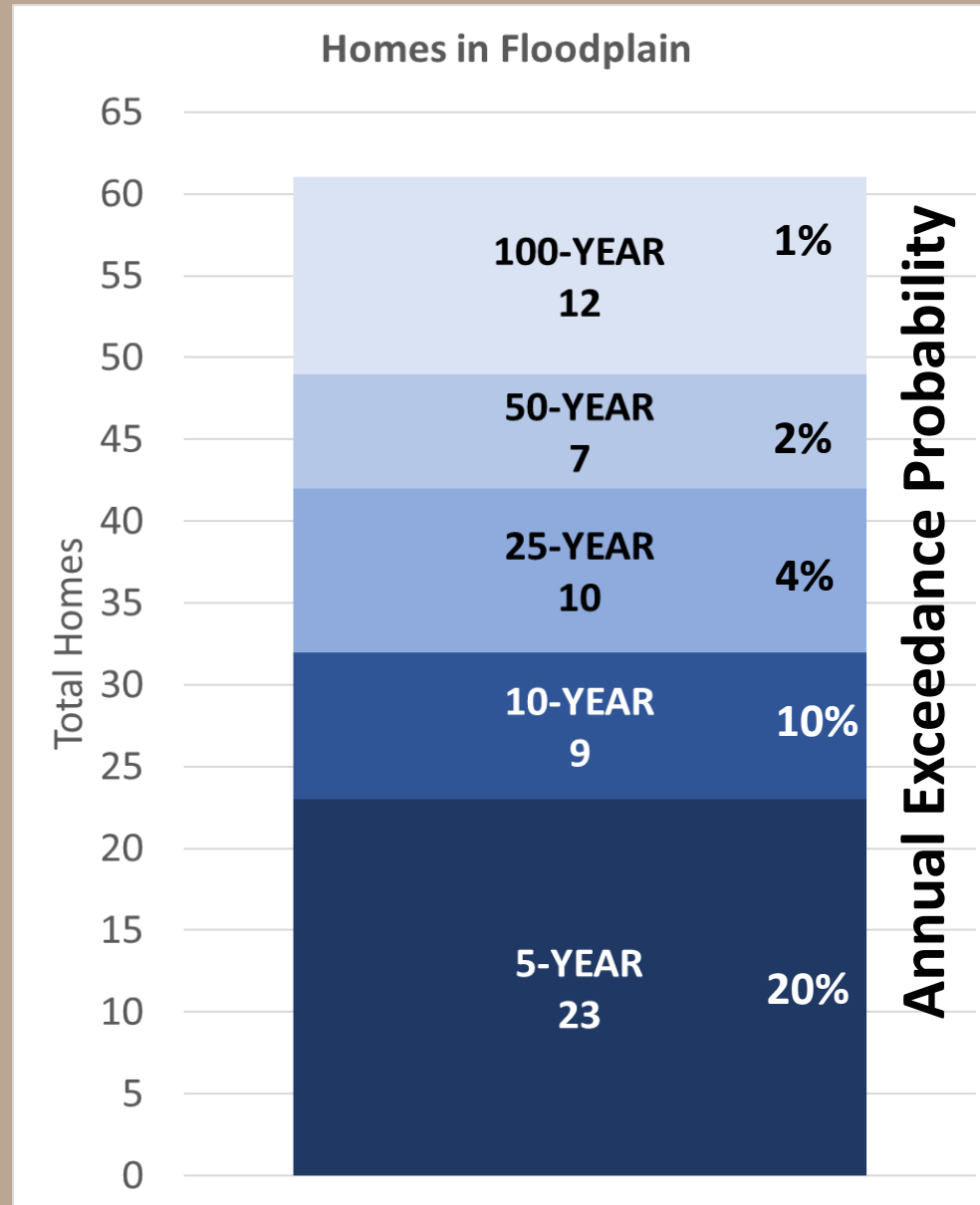
**Josey Lane
1-year**



Structural Flooding



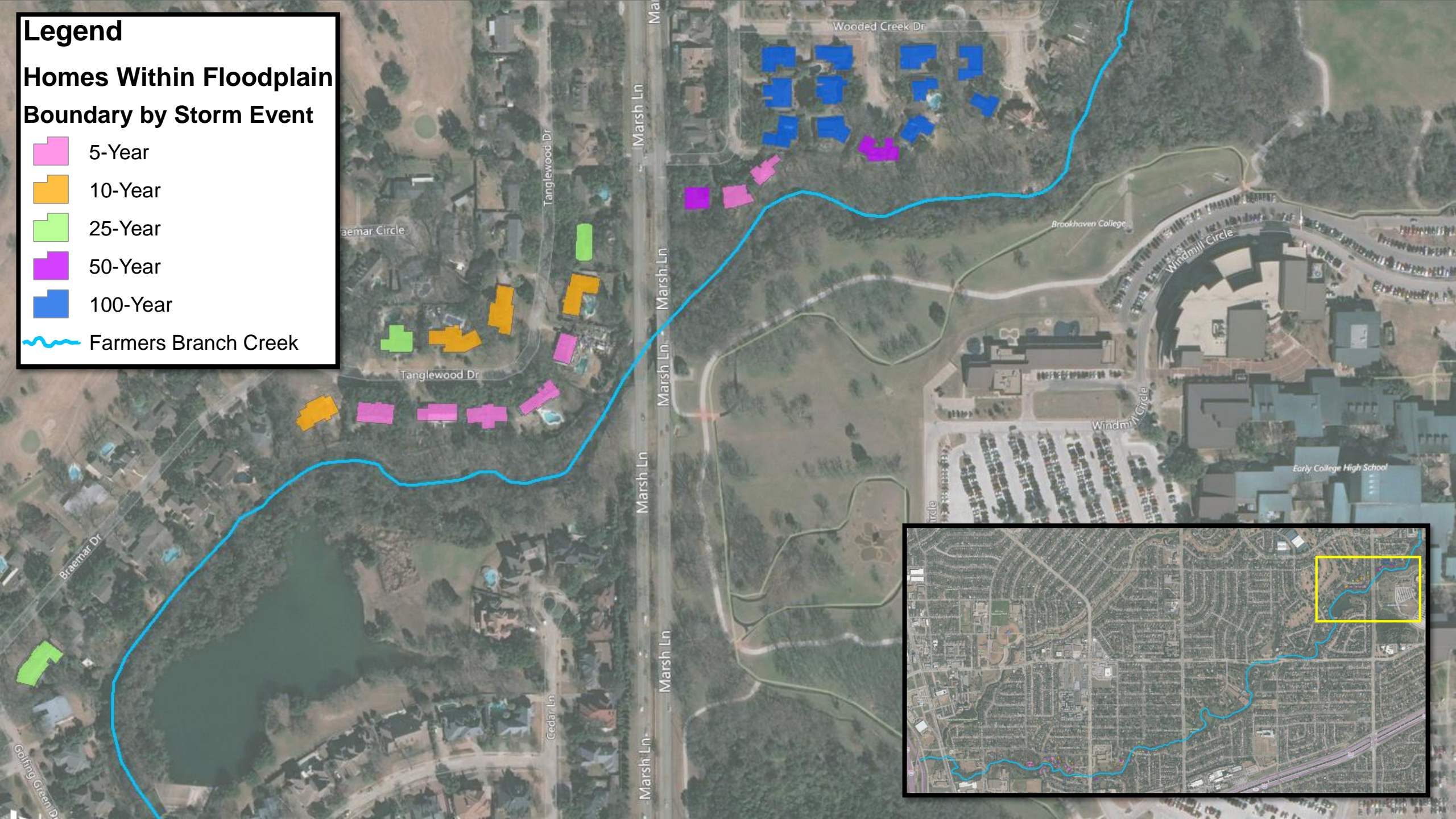
Flood Risk – Private Structures

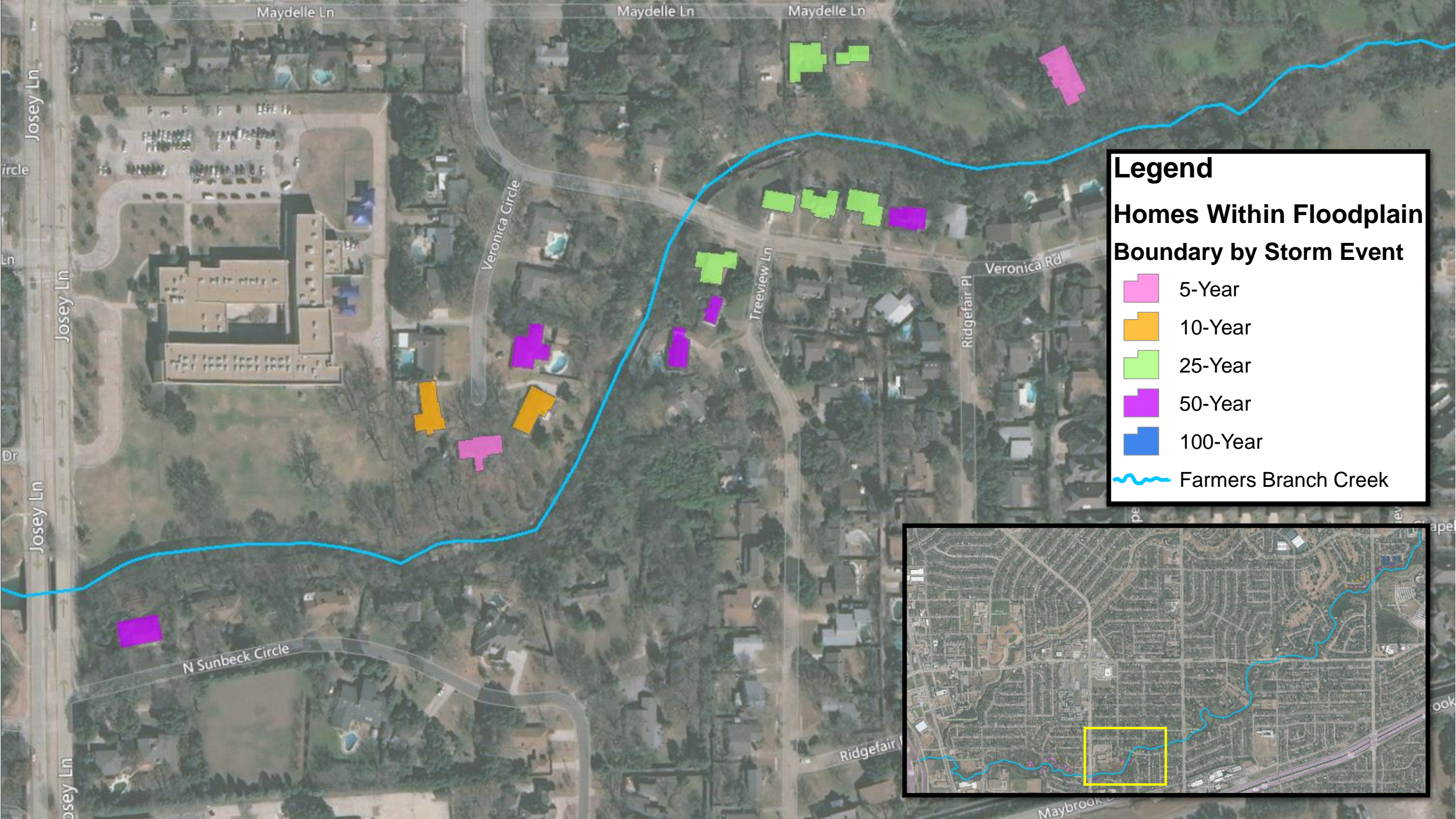


Legend

Homes Within Floodplain Boundary by Storm Event

- 5-Year
- 10-Year
- 25-Year
- 50-Year
- 100-Year
- Farmers Branch Creek





Maydelle Ln

Maydelle Ln

Maydelle Ln

Josey Ln

Josey Ln

Josey Ln

Josey Ln

Veronica Circle

Treeview Ln

Ridgefair Pl

Veronica Rd







N Sunbeck Circle

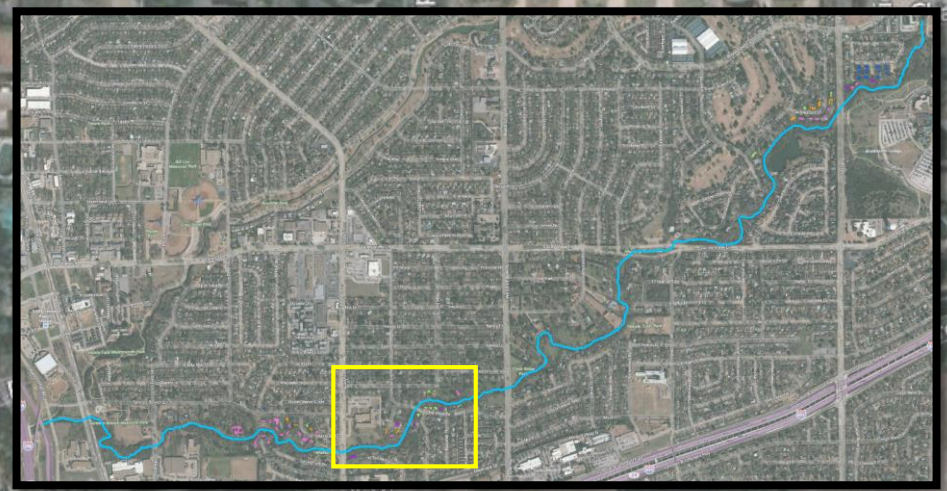
Ridgefair

Maybrook

Legend

Homes Within Floodplain Boundary by Storm Event

	5-Year
	10-Year
	25-Year
	50-Year
	100-Year
	Farmers Branch Creek



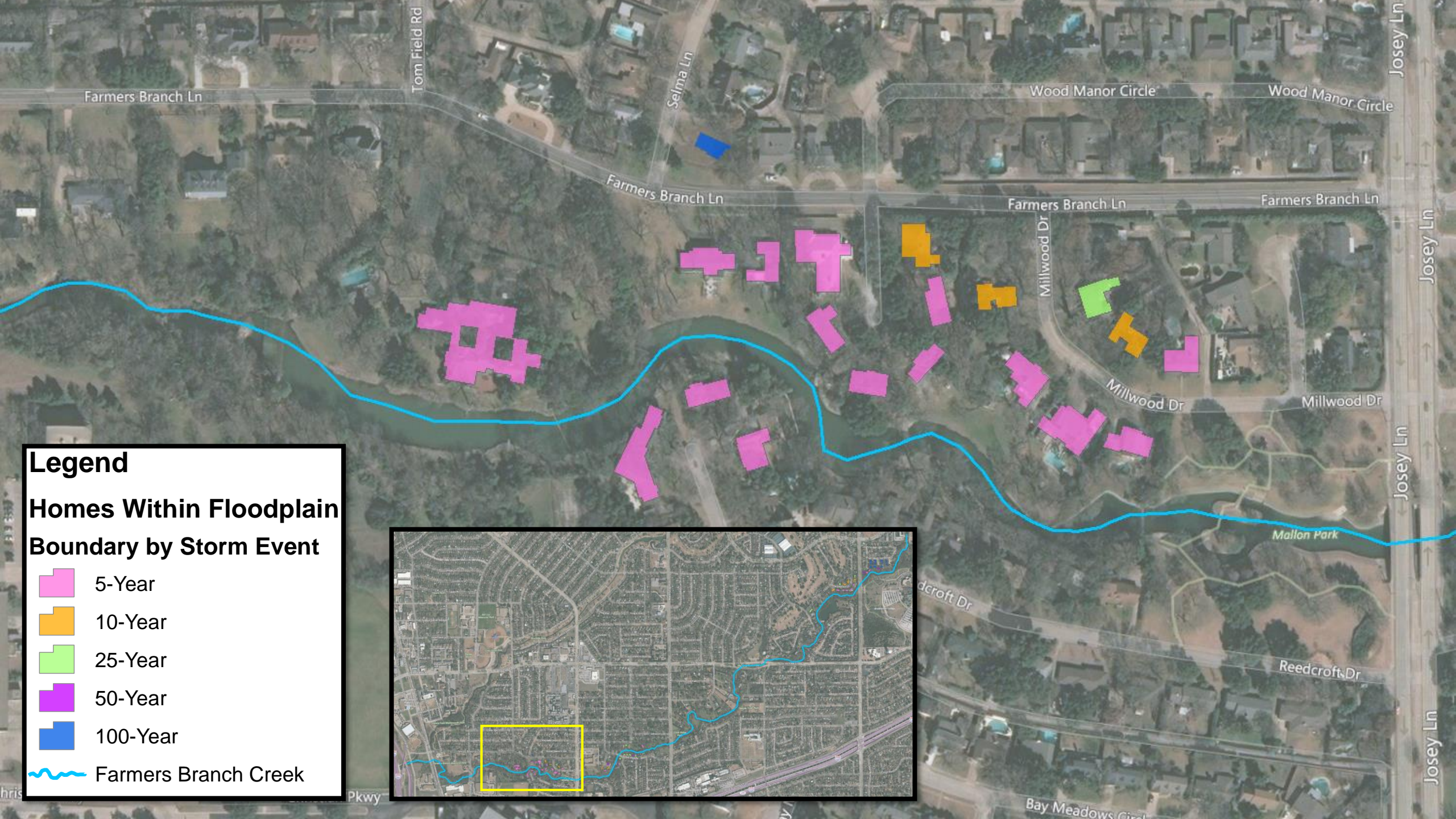
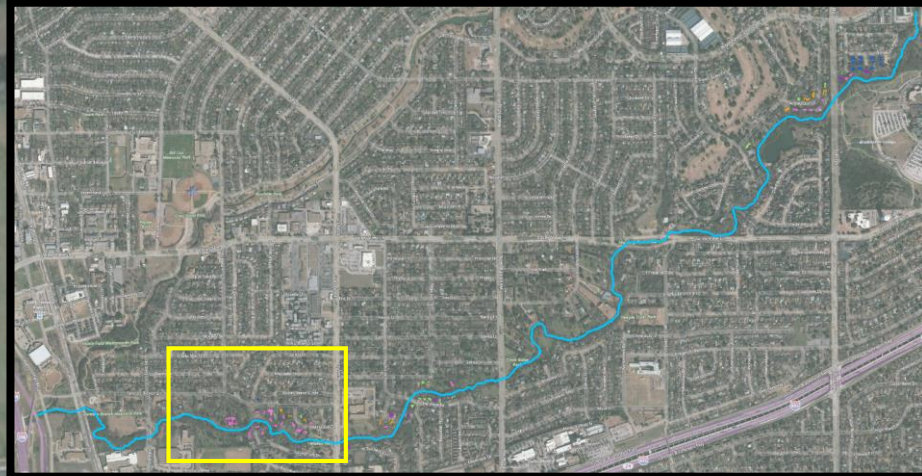
Legend

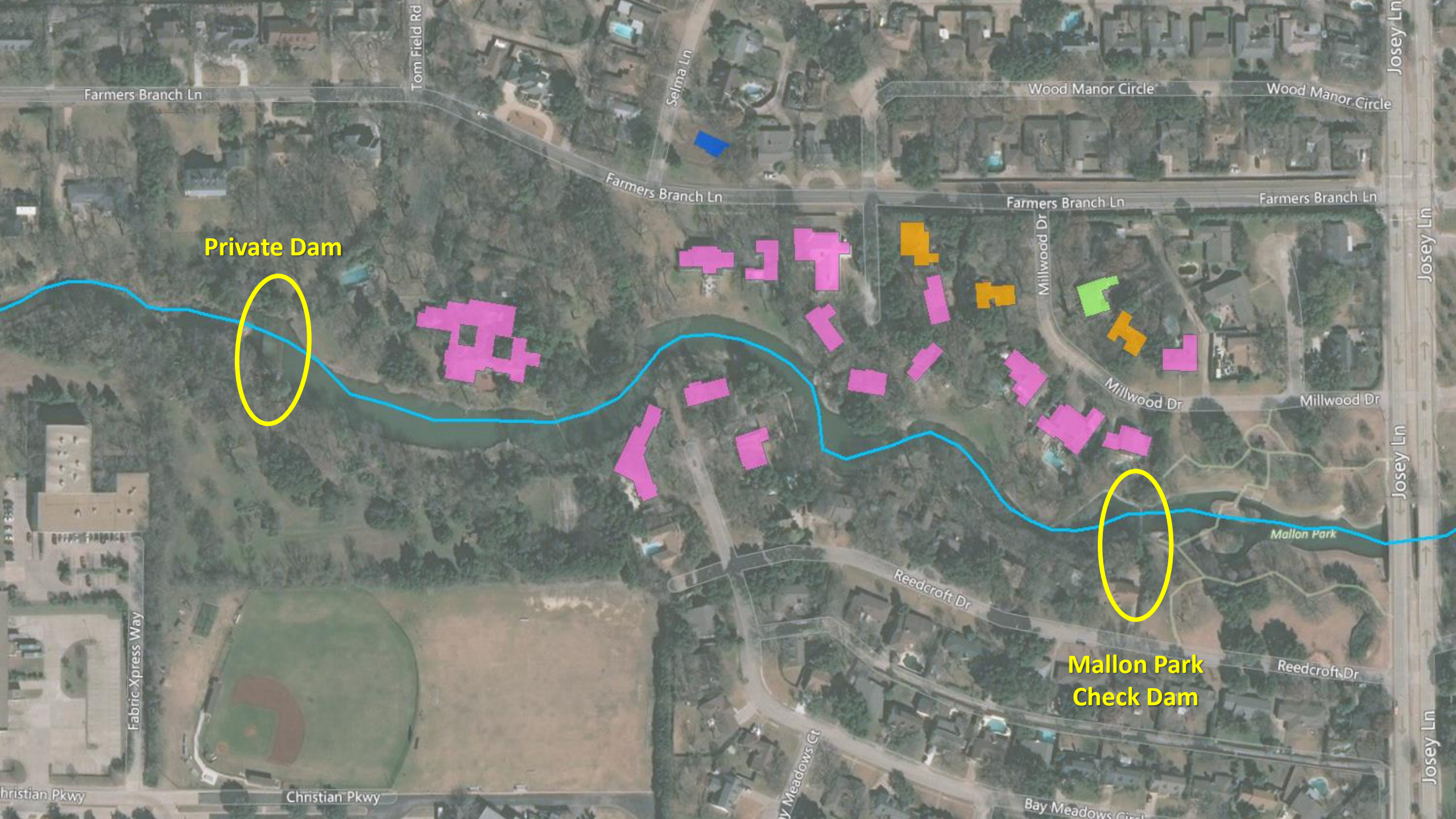
Homes Within Floodplain

Boundary by Storm Event

- 5-Year
- 10-Year
- 25-Year
- 50-Year
- 100-Year

Farmers Branch Creek





Private Dam

**Mallon Park
Check Dam**

Farmers Branch Ln

Tom Field Rd

Selma Ln

Wood Manor Circle

Wood Manor Circle

Farmers Branch Ln

Farmers Branch Ln

Farmers Branch Ln

Millwood Dr

Millwood Dr

Millwood Dr

Reedcroft Dr

Reedcroft Dr

Josey Ln

Josey Ln

Josey Ln

Josey Ln

Fabric Xpress Way

Christian Pkwy

Bay Meadows Ct

Bay Meadows Circle

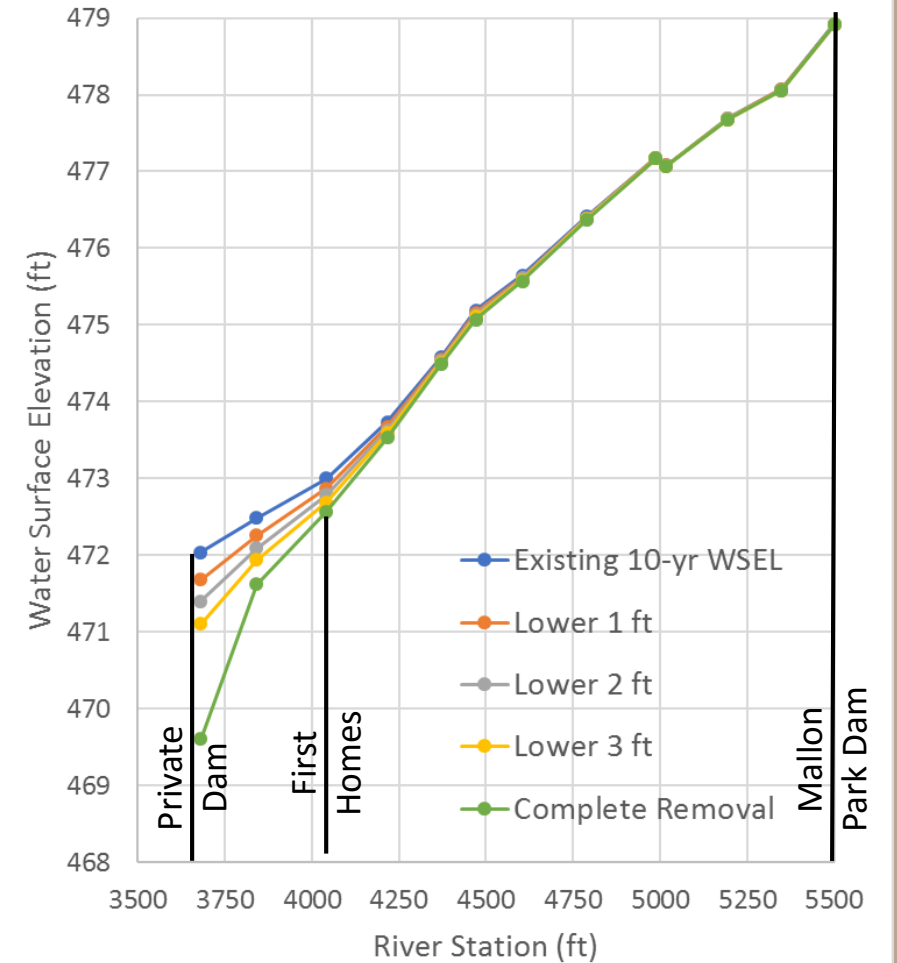
Christian Pkwy

Mallon Park

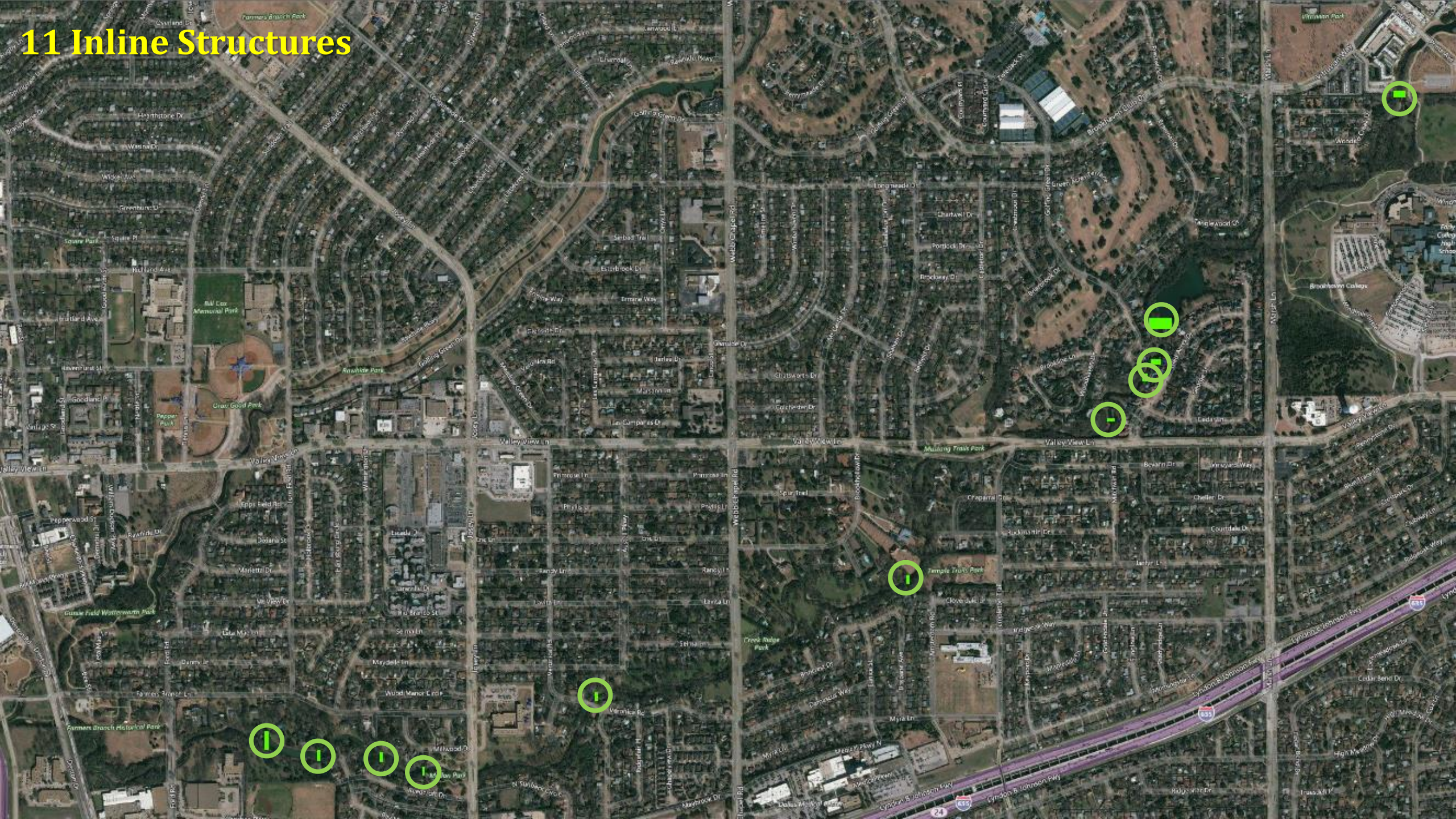
Conceptual Solution: Remove Inline Structures



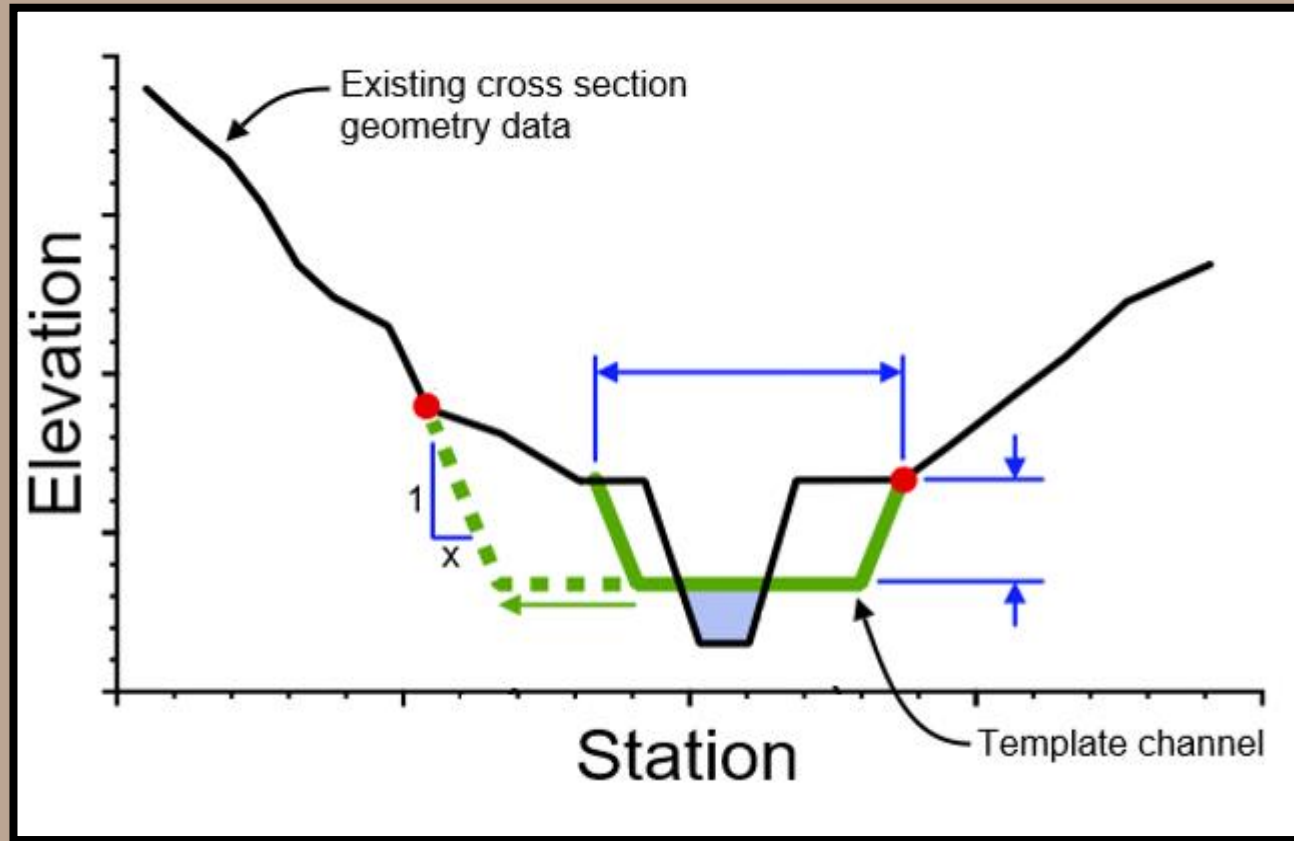
10-Year Water Surface Elevation



11 Inline Structures

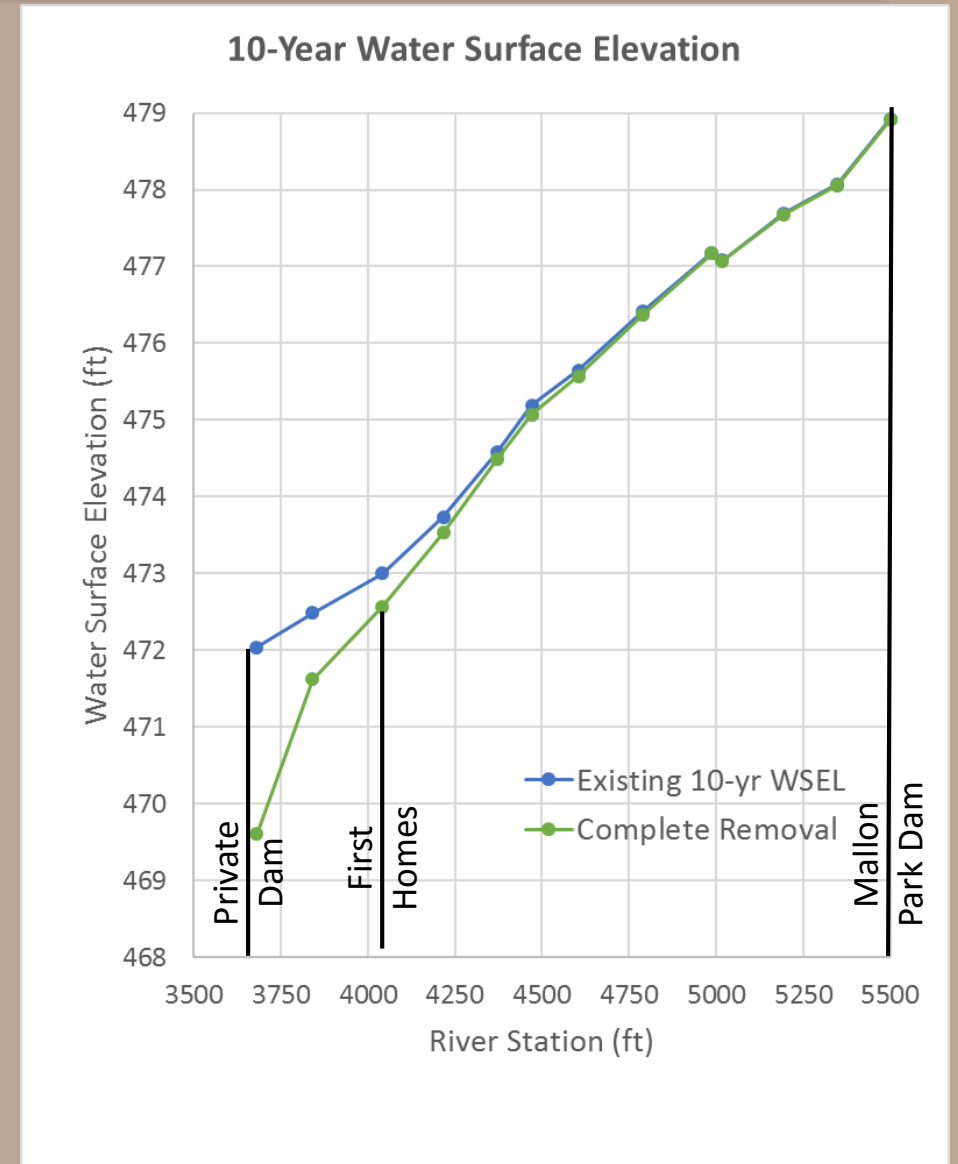


Conceptual Solution: Channel Geometry Modification

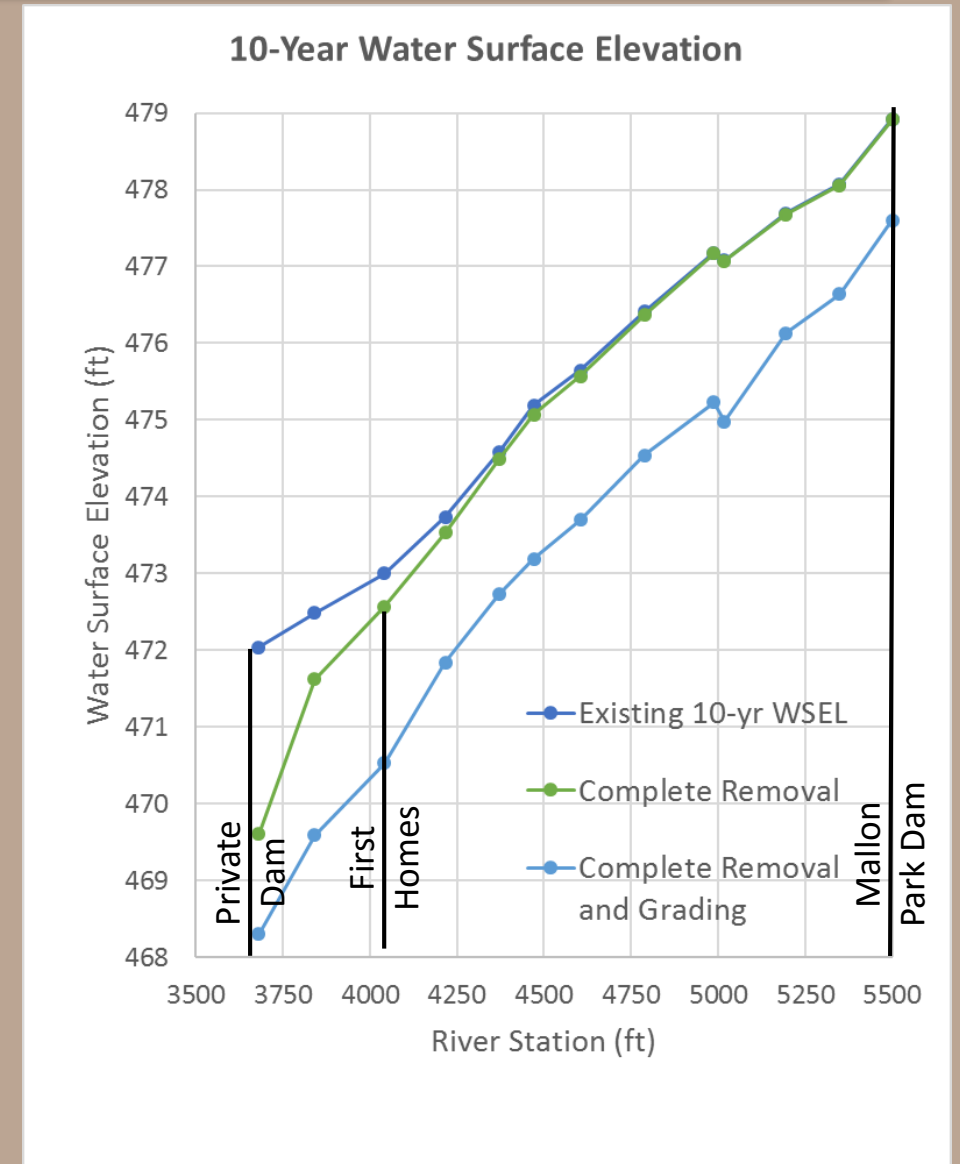


- Channel grading
- Channel widening
- Channel lining
- Increase channel capacity during small storm events
 - Additional channel capacity is often an added benefit of erosion control efforts

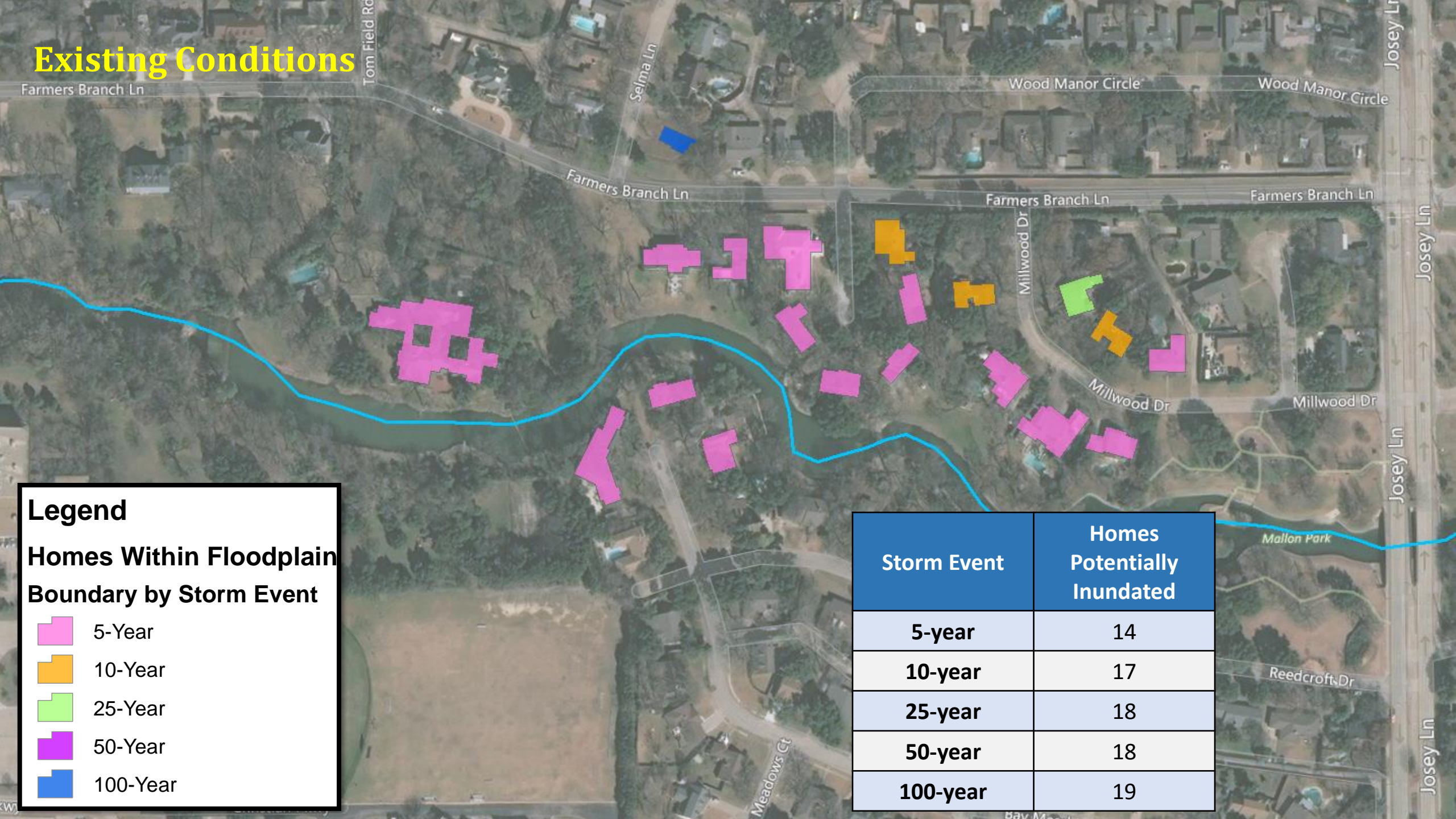
Conceptual Solution: Remove Inline Structures



Conceptual Solution: Remove Inline Structures + Channel Modification








Existing Conditions



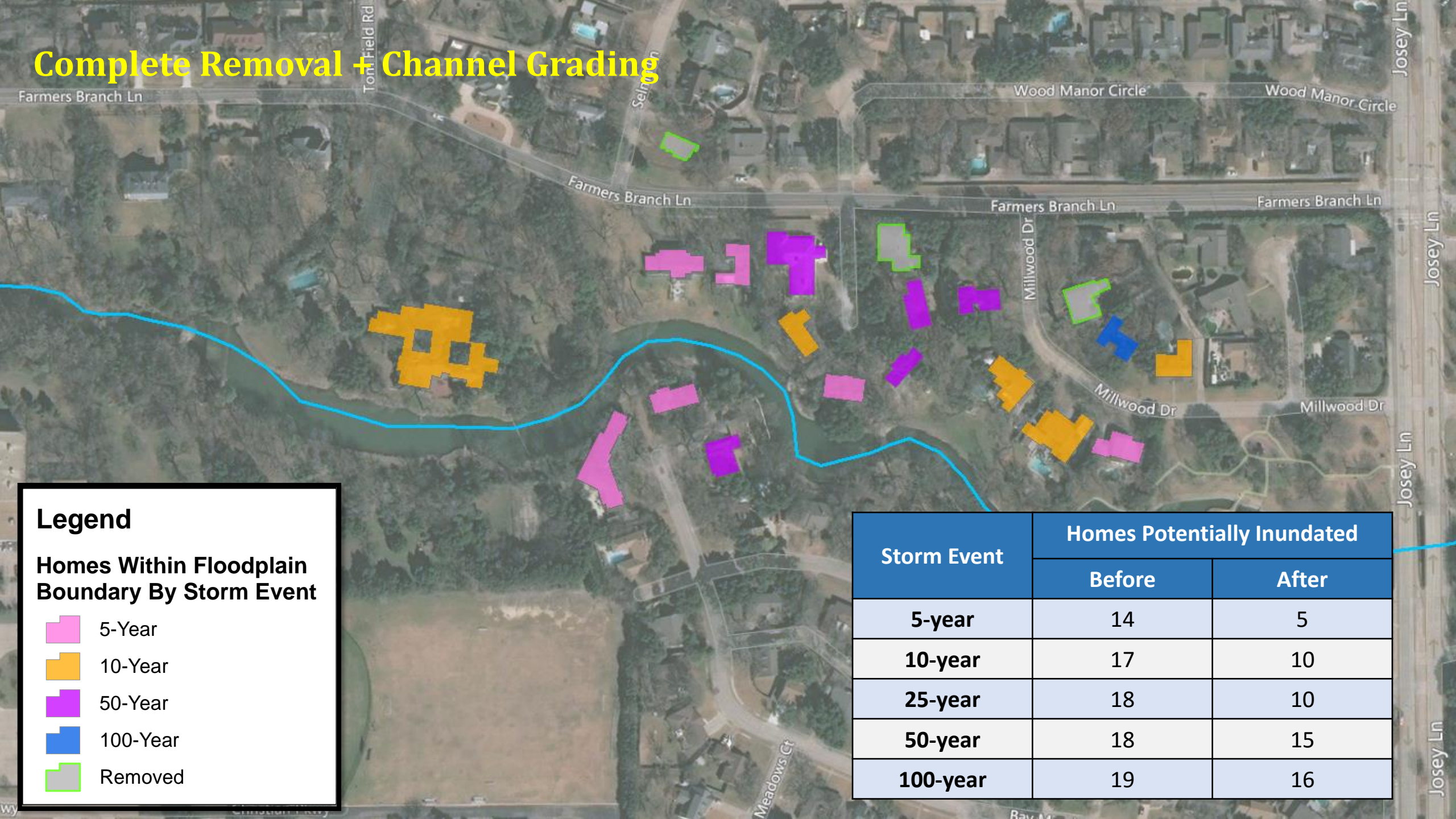
Legend

Homes Within Floodplain Boundary by Storm Event

-  5-Year
-  10-Year
-  25-Year
-  50-Year
-  100-Year

Storm Event	Homes Potentially Inundated
5-year	14
10-year	17
25-year	18
50-year	18
100-year	19

Complete Removal + Channel Grading



Legend

Homes Within Floodplain Boundary By Storm Event

- 5-Year
- 10-Year
- 50-Year
- 100-Year
- Removed

Storm Event	Homes Potentially Inundated	
	Before	After
5-year	14	5
10-year	17	10
25-year	18	10
50-year	18	15
100-year	19	16

Conceptual Solution: Offline Detention

- Functional public spaces such as parks
- Serve as detention facilities for small storm events
- Limited space for creating detention facilities on public parcels



**Hulen St./Bryce Ave.
Fort Worth**

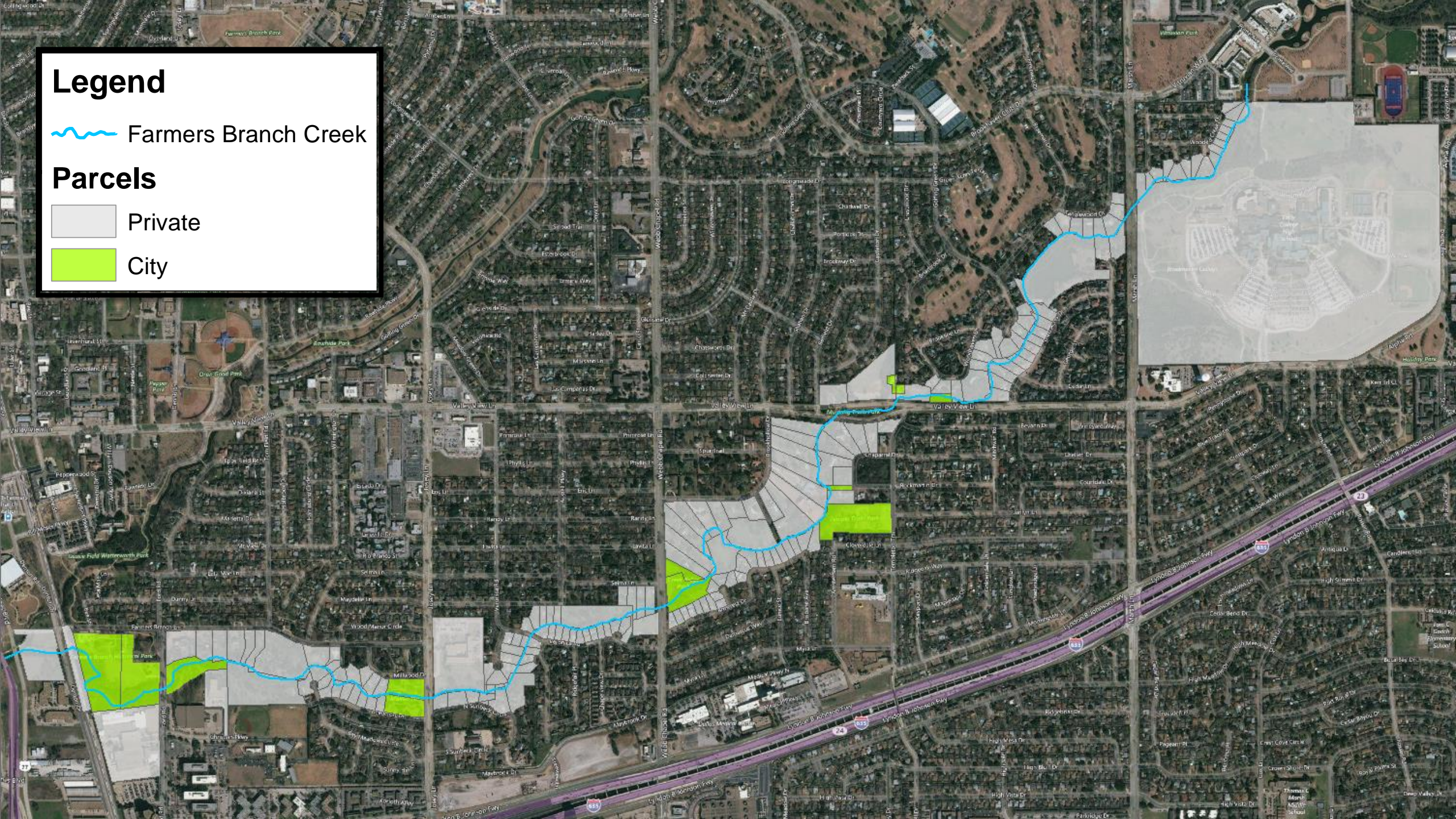
Legend

 Farmers Branch Creek

Parcels

 Private

 City



Additional Areas of Interest

- **Brookhaven College**

- Open space
- Beginning of reach
- Environmental considerations
- Requires coordination with college officials

- **Valley View Park Estates Pond**

- Expands existing hydraulic feature
- Beginning of reach
- Likely to require modification to dam, which may be expensive
- Environmental Considerations
- Requires coordination with HOA

