

Near West Side Stormwater Management

Linwood Neighborhood Association Meeting

September 8, 2022

Good Evening!
**The presentation will
begin at 6:05.**

- During the presentation, everyone except the presenters will be muted
- We will answer questions at the end of the meeting
- If you have a question, please post it in the chat using the chat button OR use the hand button to be called on to ask your question verbally
- The presentation will be recorded and shared after the meeting. Thank you!

Presented by:



Jennifer Dyke – Interim Assistant Director, Streets, Stormwater & Right-of-Way, Transportation & Public Works Dpt. (TPW)

Eric Fladager, Assistant Director of Planning & Data Analytics

Stephen Nichols- Engineering Manager, Stormwater Development Services, Development Services Dpt.

Clair Davis- Floodplain Administrator, TPW, Stormwater Division

- Program Overview
- August 21-22, 2022 Storm Event
- Near West Side Development Background & Flood Risk
- What Can Be Done?
 - Long/Mid Term
 - Short Term
- Conclusions



What is the City Going to do and When?

- No easy solution to mitigate the flooding
- Would take significant
 - Funding
 - Phasing
 - Consideration of citywide needs and priorities
- Continued maintenance of the existing system
- Rehabilitation of the existing system based on priority
 - To improve condition not capacity
- Review of existing development regulations to identify potential refinements
- Evaluate opportunities for partnerships and parcels that could potentially be used for stormwater detention
- Continued internal discussions with Council

Stormwater Program Overview

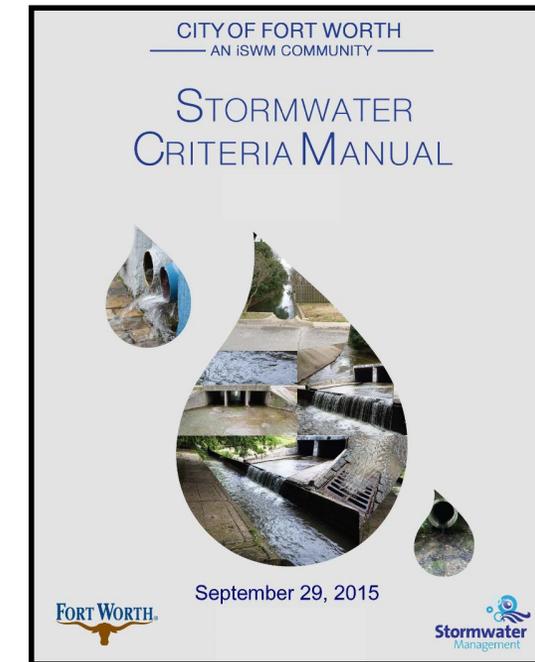
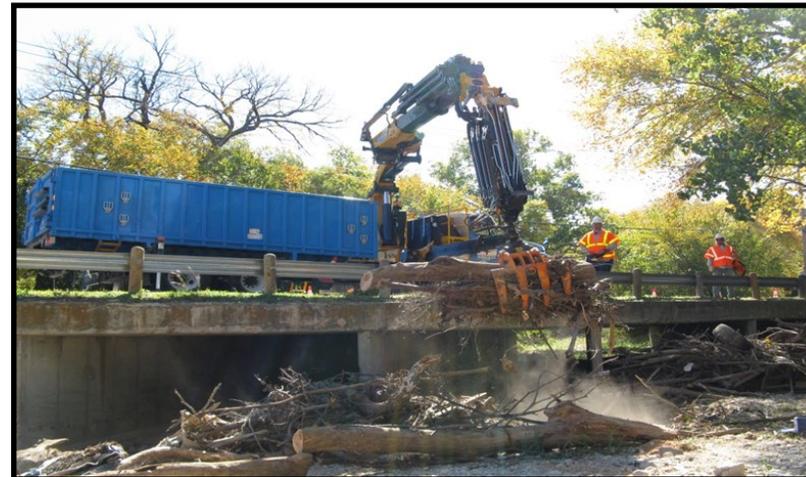
Stormwater Mission

Protect people and property from harmful stormwater runoff

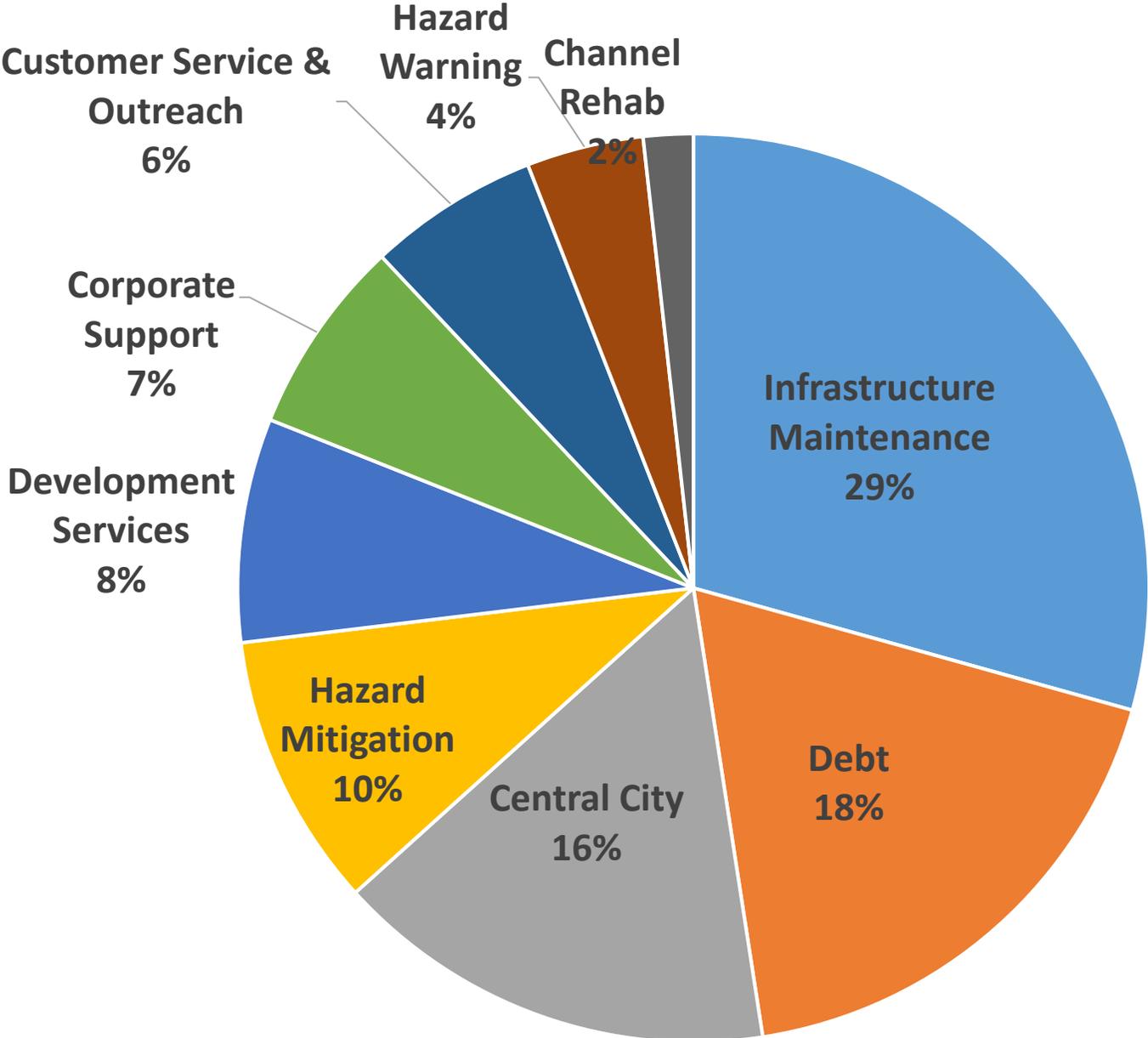


Primary Functions

- Maintain system such as pipes, channels, etc.
- Mitigate flooding and erosion hazards
- Warn community of hazards
- Review development for compliance with City standards

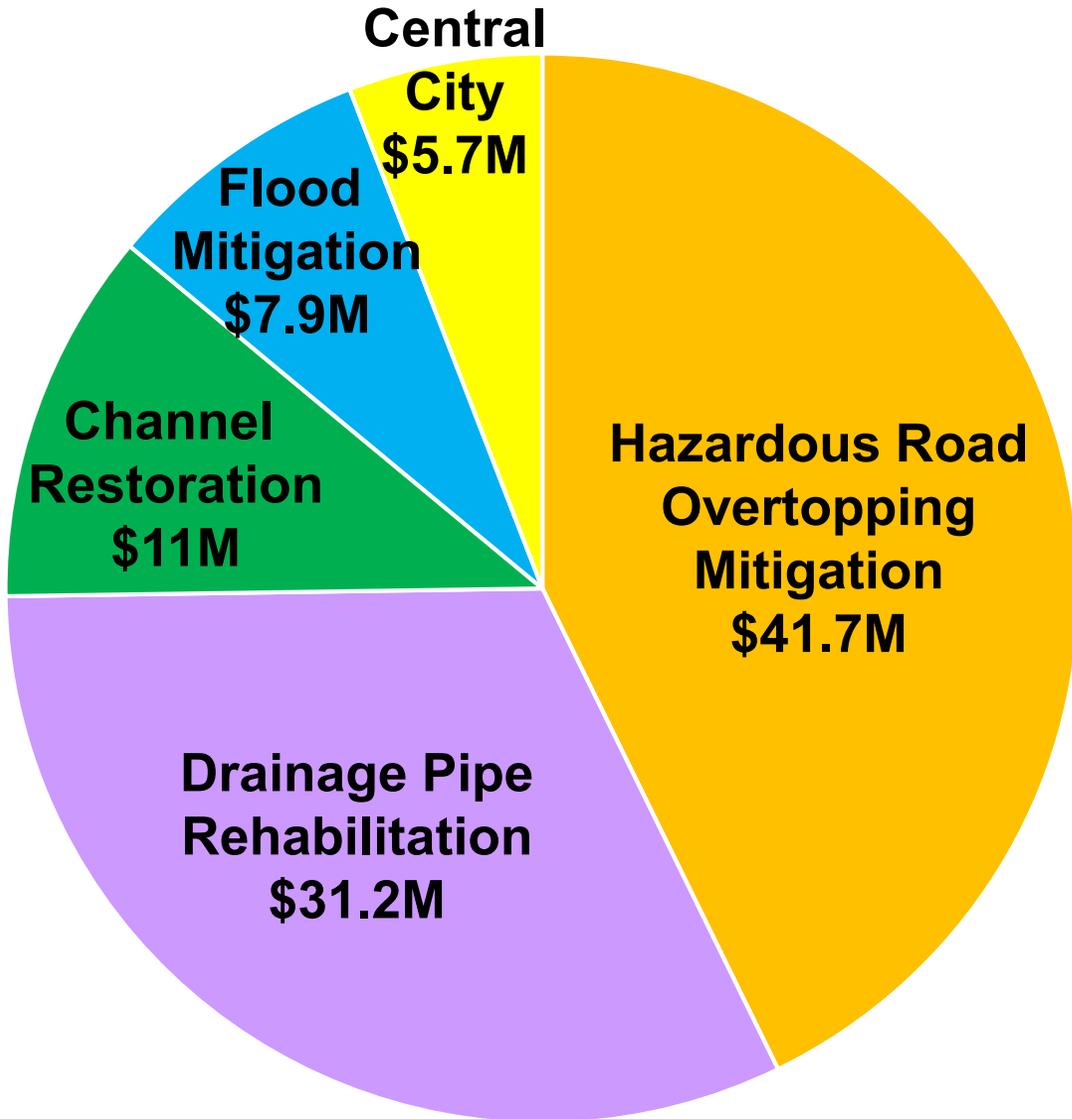


FY23 Recommended Budget - \$53 million



Infrastructure maintenance includes storm drain rehabilitation

Revenue Bond Program



Oct. 2019- Council approved 6.5% fee increase

Jan. 2020- Fee increase took effect

Provides ability to issue **~\$98M total** in revenue bonds to accelerate the delivery of high priority capital projects

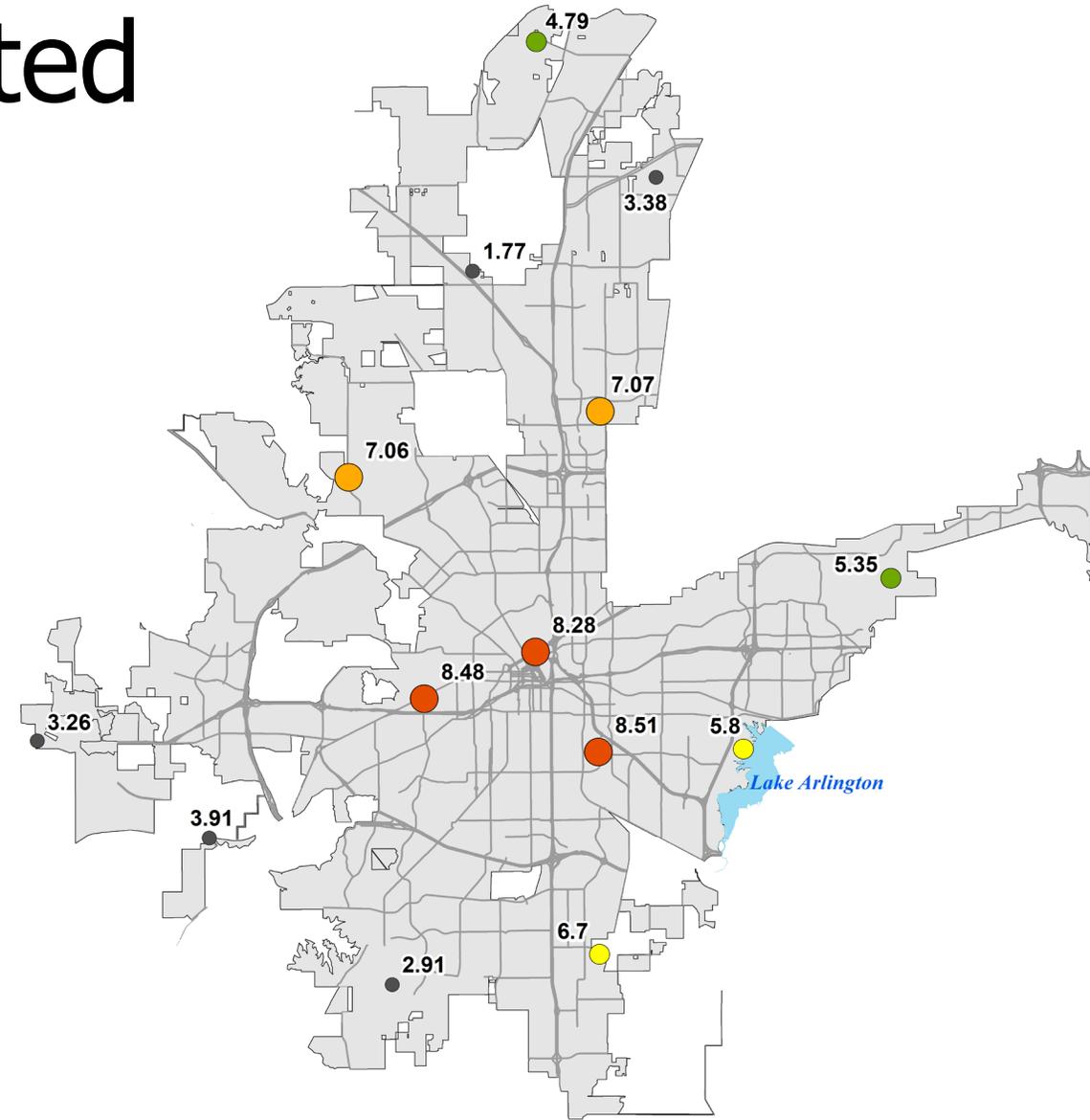
- \$53M - Nov. 2020 (FY21)
- \$44.5M – 2023 (planned)

August 21-22 Rain Event

Rain Measured at Dedicated Weather Stations

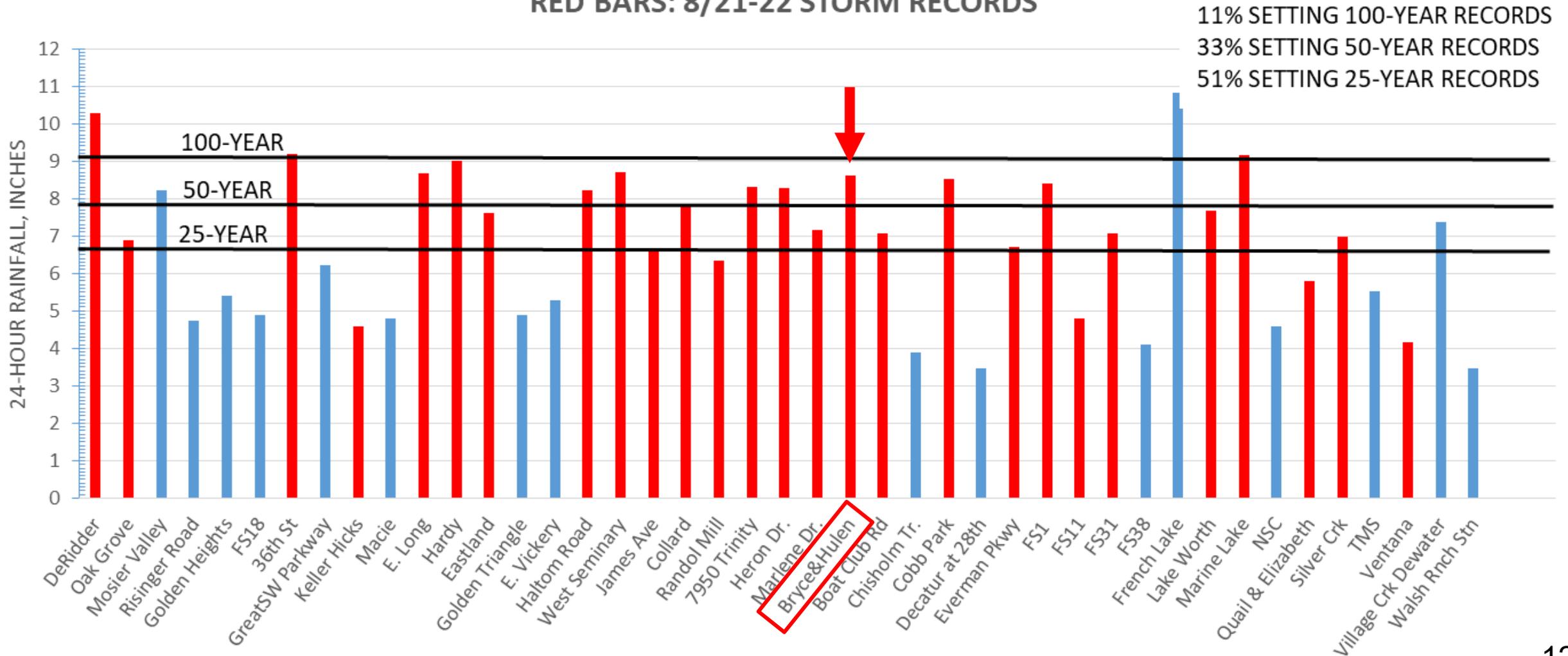
Rainfall Event
8/21/2022 4pm to 8/22/2022 8pm

- Less than 5 Yr
- 5 Yr
- 10 Yr
- 25 Yr
- 50 Yr



Aug. 21-22, 2022 Rain Event

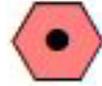
24-HOUR RAINFALL BY GAUGING STATIONS, 2015-2022
 RED BARS: 8/21-22 STORM RECORDS

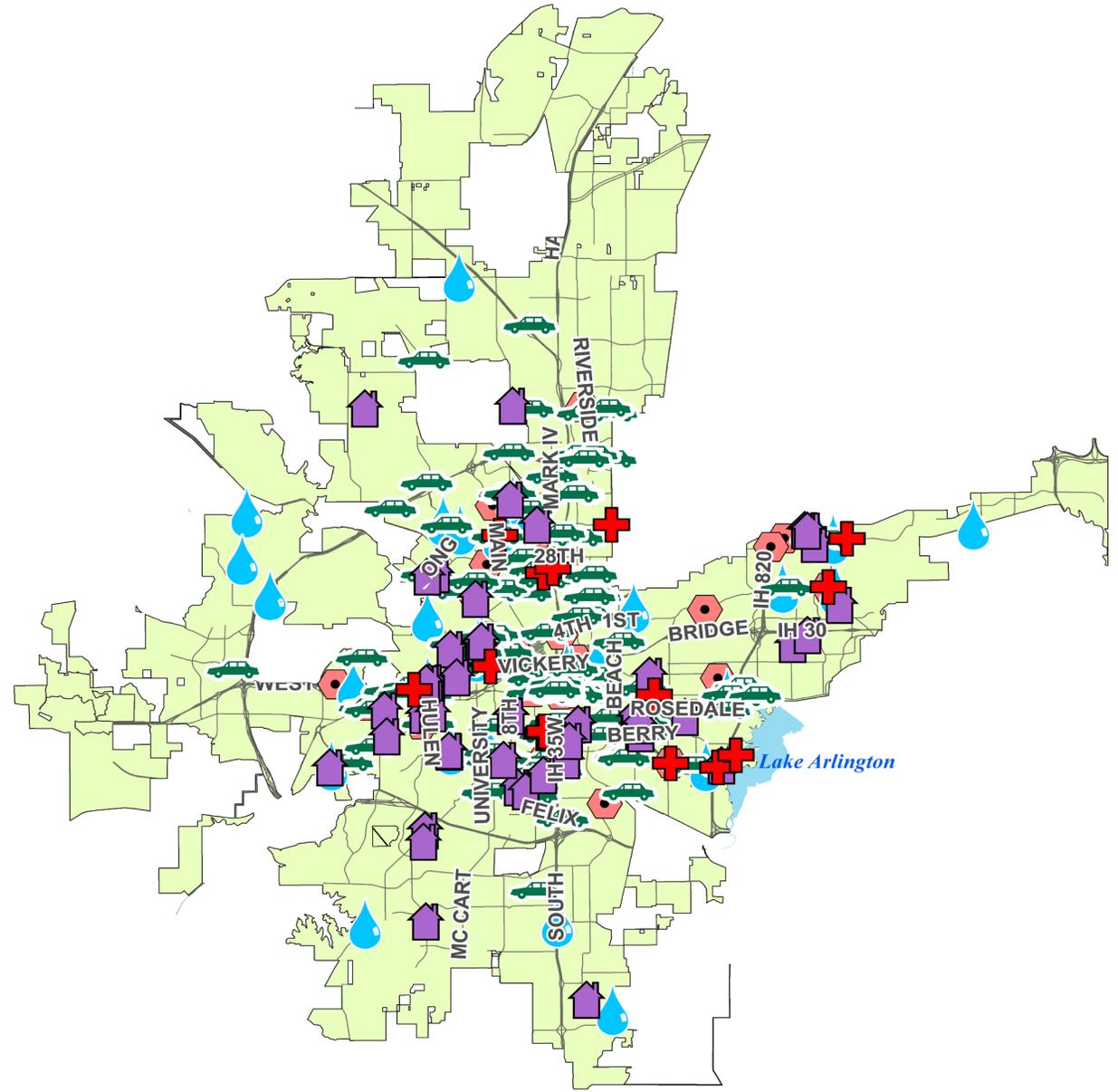


Linwood Area Flooding Over Aug. 21-22

- Two 5-year events (20% chance of occurring any given year in any given location) over the long duration storm
 - The flooding depths/extent experienced is similar to the mapped 5 year non-FEMA flood risk
- The Trinity River elevation was low enough so the local drainage system should have been able to drain through the flap gates as designed

Reported Flooding Aug. 21-22, 2022

-  52 flooded homes
-  22 high water rescues
-  237 flooded vehicles
-  58 overtopped road locations
-  36 fire/police response



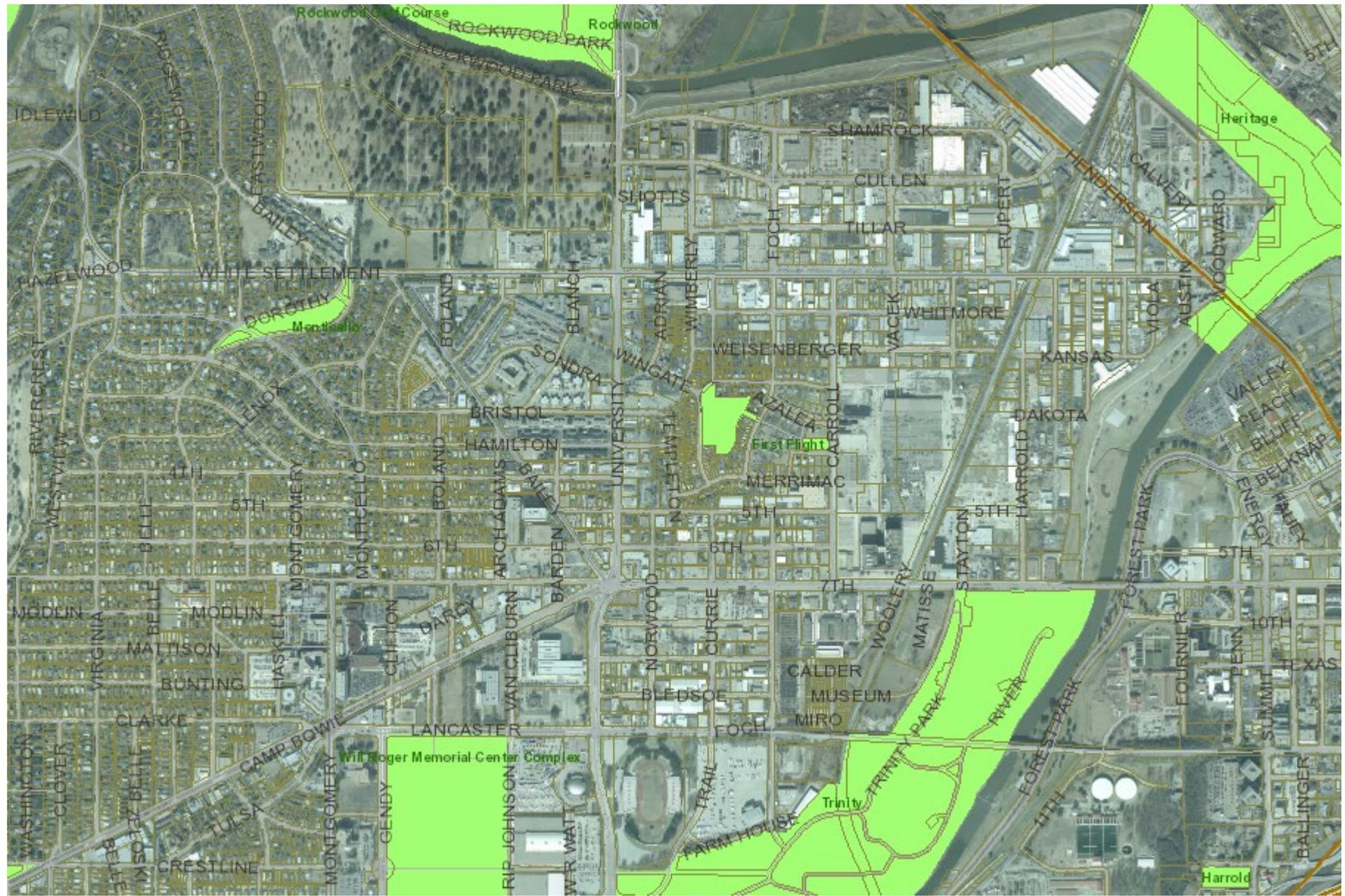
Note: Incident counts as of 9/1/2022 and may change as reports are still coming in

Linwood Area Pre & Post Storm Event Check

- Inlets on Bristol, Templeton and Wingate were checked on 8/19 in advance of the 8/21 rain event to ensure they were not clogged and ready for the anticipated rainfall
- While no inlet clogs were found, due to the significant flooding, cameras were put through the system on Templeton, Bristol and West 5th Street on August 29th and 30th to check to see if there was a clog further down in the drainage pipe to ensure the pipe is fully functional and ready for the next rain event
 - No clogs were found

Near West Side Development Background & Flood Risk

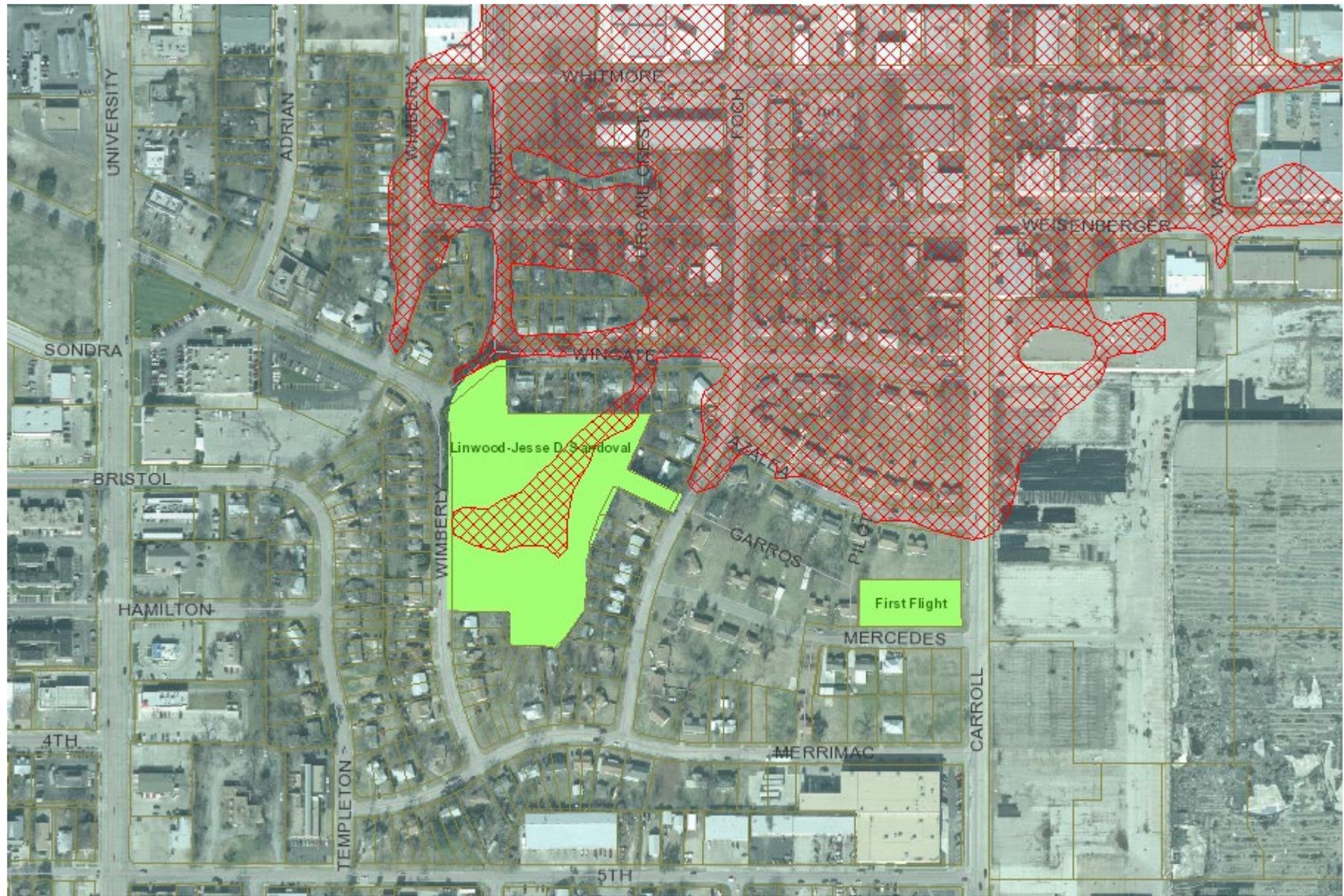
2003 Aerial (before redevelopment)



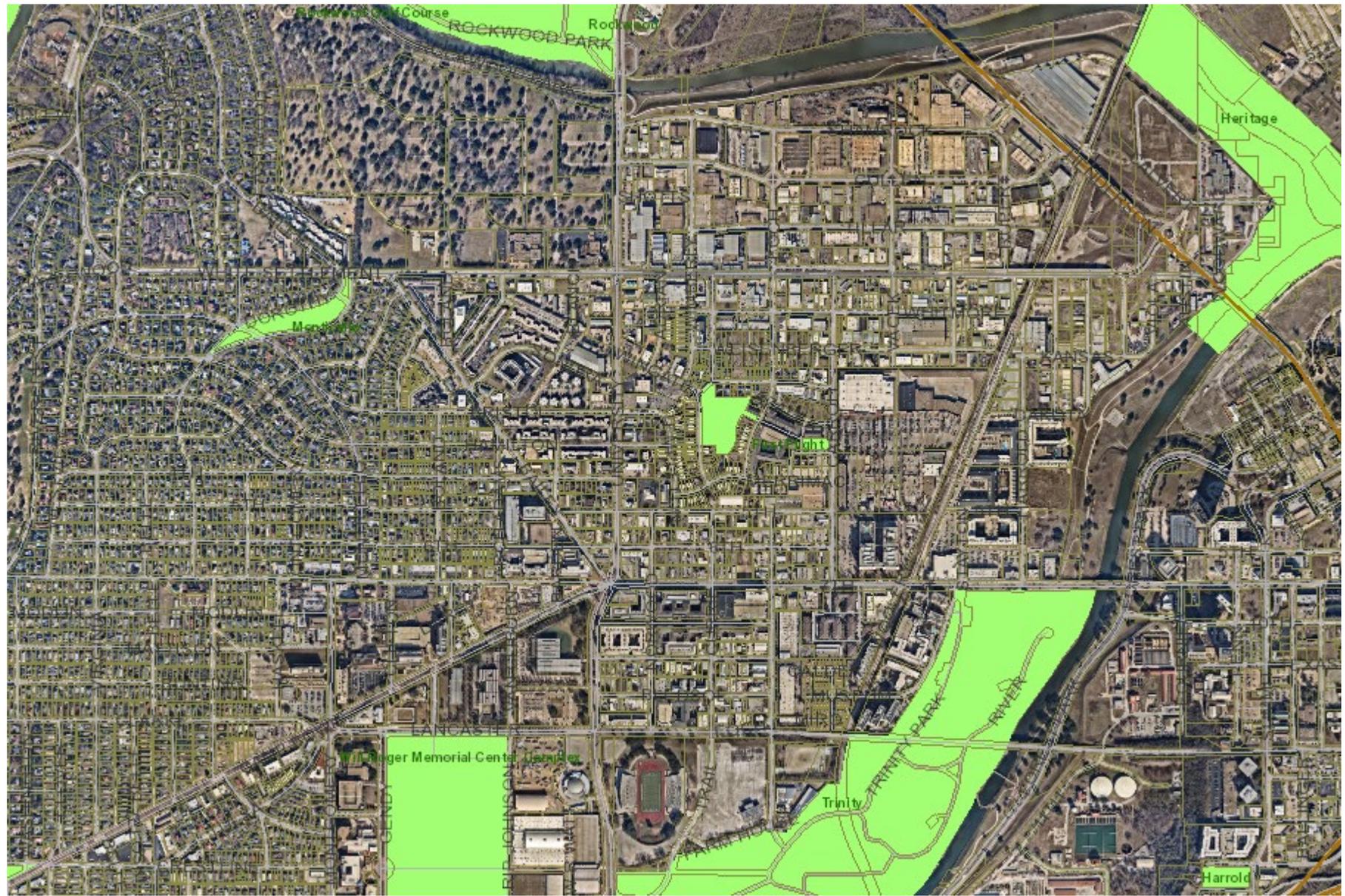
2003 Aerial (before redevelopment)



2003 Aerial with FEMA Floodplain (before redevelopment)



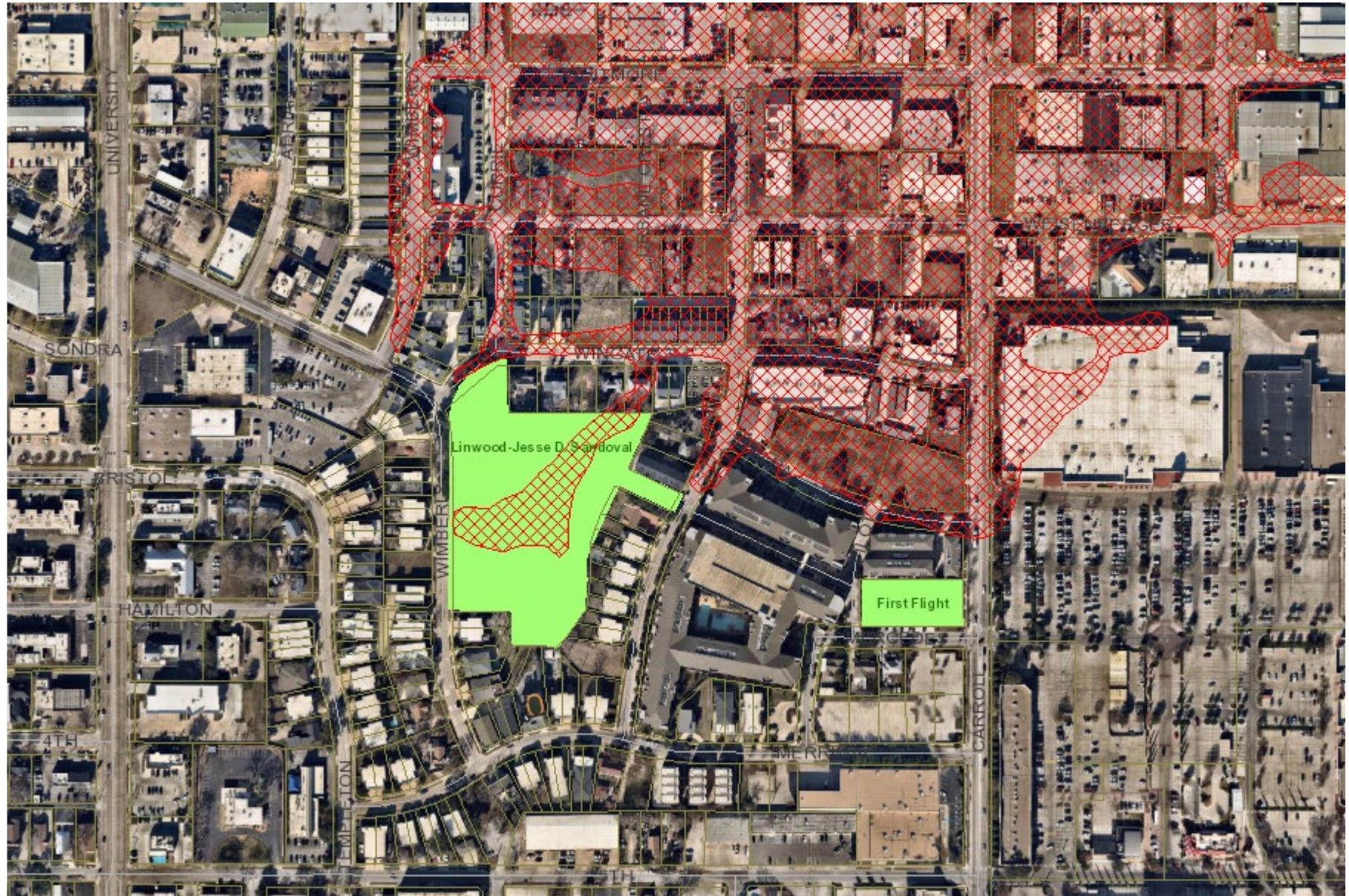
2022 Aerial



2022 Aerial



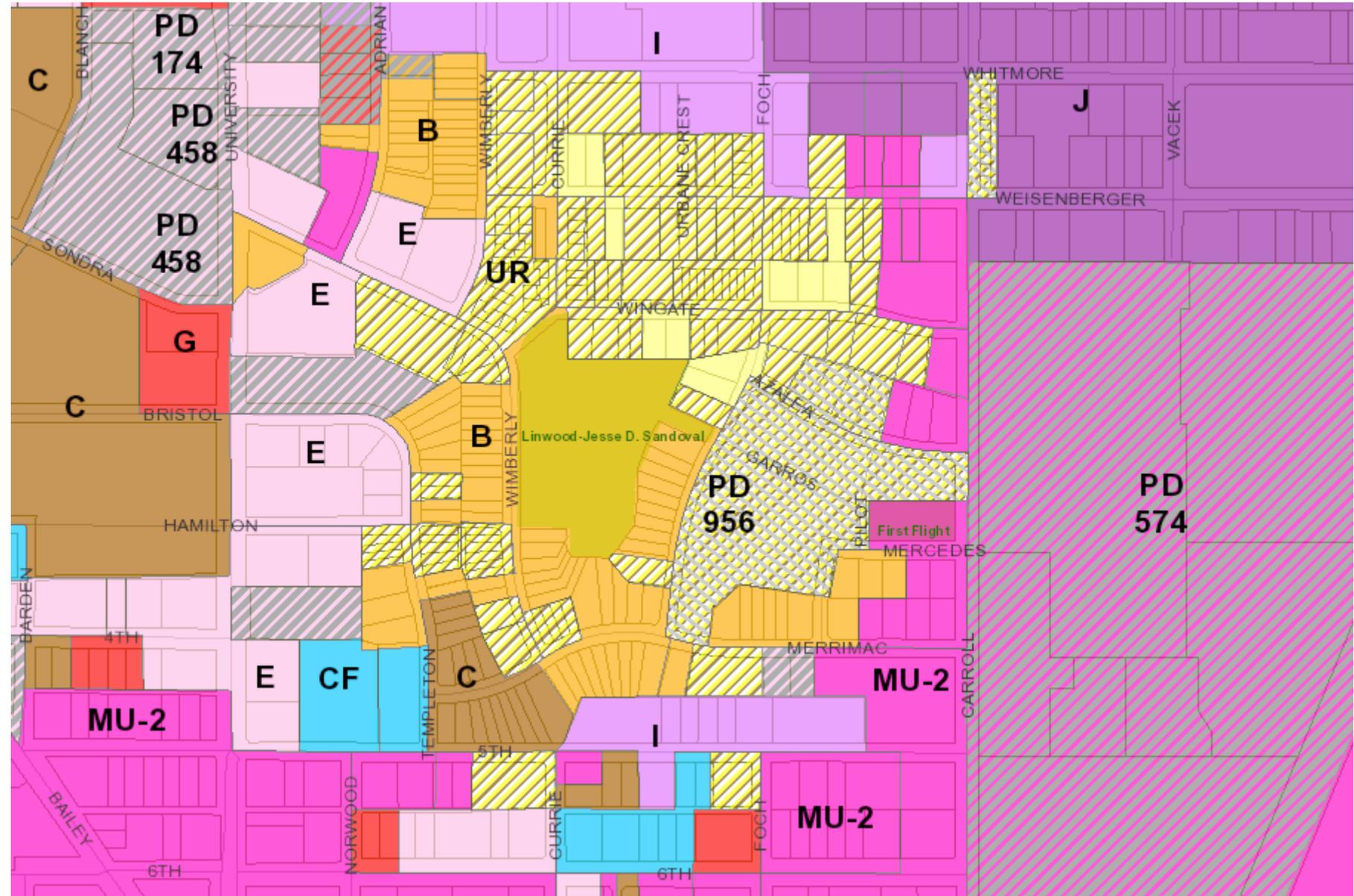
2022 Aerial with FEMA Floodplain



Zoning Map

Urban Residential (UR) Zoning:

- Based on MU-1 design standards
- Walkability
- Housing choices
- Density transition



Why is Flooding a Problem in this Area?

Is new development the problem??

- This area has a long history of flooding
- Large drainage area contributing large volume of stormwater runoff
- Older, undersized storm drain system – some pipes from 1920's
- Very flat
- Trinity River levees create sump area on FEMA floodplain maps
- Flap gates on pipes under levees prevent Trinity River flooding
- If Trinity River level is high, over the local drainage system flap gates, the local storm drain system could be impacted

Drainage Regulations

- New development must comply with City drainage regulations
- Regulations based on North Central Texas Council of Governments regional standards/generally accepted engineering practice
- Does not have to mitigate existing flooding
- Over-riding principle: “No *Adverse Impact*” through a zone of influence (ZOI), meaning once the project is complete:
 - No significant increase in peak runoff from the site
 - No significant increase in offsite flood depths
 - No significant increase in erosion risk

Drainage Regulations

- Currently, these developments must show compliance with City drainage regulations
 - Any development within FEMA floodplains
 - Developments (land disturbance) over 1.0 acre in size
 - Common plan developments in which non-contiguous land disturbance totals over 1 acre
 - Properties being re-platted
- The above types of development
 - Must ensure finished floor elevations are 2 feet above the 100-year flood elevation (or floodproof)
 - Must maintain flood storage if in FEMA floodplain sumps
 - Not permitted to regrade in a way that adversely impacts adjacent properties
 - Not permitted to increase runoff if there is not available storm drain capacity with ZOI
- Development (land disturbance) less than 1 acre that doesn't fit the criteria above does not have to show compliance with City drainage regulations (it isn't reviewed by the City)
 - Historically small lot development (such as townhomes) in Linwood hasn't undergone Stormwater review

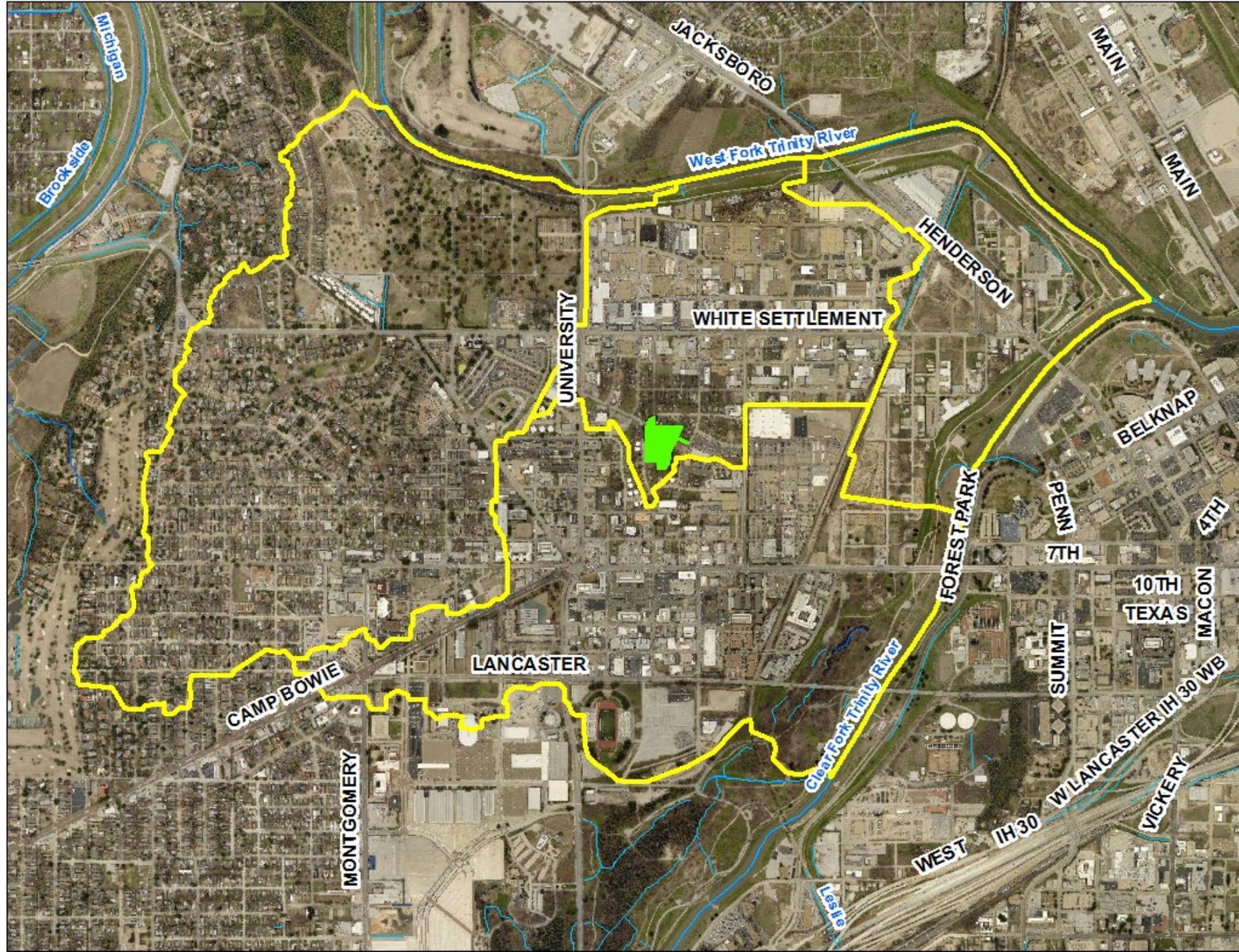
Drainage Regulations Exclusions

- Impacts during the site development process (i.e. interim conditions)
- Increases in the total volume of runoff from the site

Streets & Stormwater Management

- Streets are an integral part of the local drainage system and are designed to convey stormwater to inlets and channels
- In developments constructed since the City's 1975 update to the 1967 Stormwater Criteria Manual, regulations require runoff from a:
 - 5 year event be contained within the top of curb
 - 100 year event be contained within public right-of-way (typically 10 ft beyond curbs)
- Streets in areas developed prior to this were typically built to lower standards resulting in deeper street flooding and flooding beyond the public right-of-way

Drainage Area



-  Drainage Area
-  Linwood Park

Storm Drain System

STREET NAME	INSTALLED DATE
(1) GREENLEAF	2.11.1971
(2) MORTON	3.28.1930
(3) FOCH	3.28.1930
(4) CURRIE	3.1.1928, 5.1.1951
(5) STAYTON	3.1.1928
(6) NORWOOD	3.1.1928
(7) CARROLL	3.1.1928
(8) CURRIE	2.11.1971
(9) WHITMORE	2.11.1971
(10) WEISENBERGER	2.11.1971
(11) FOCH	2.11.1971
(12) TEMPLETON	5.4.1943, 2.11.1971, 5.8.2013

 Templeton Area Outfalls into Trinity River

 Storm Drain System

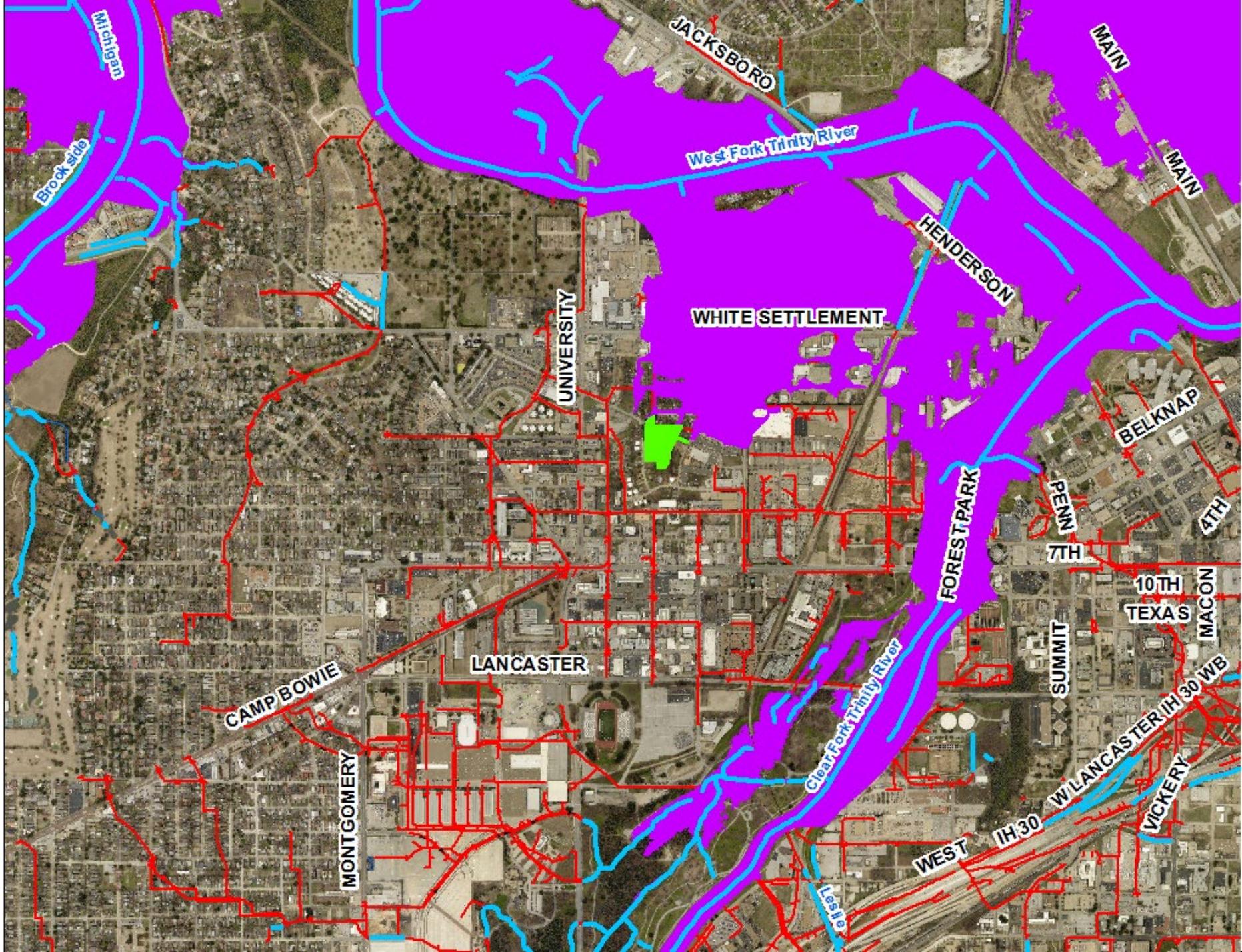


Storm Drain System Condition Assessment & Rehabilitation

- The condition of the storm drain system in the Linwood area (~7 miles of pipe) was evaluated in FY20 by closed circuit television (CCTV) camera
- The outcome resulted in several high priority storm drain restoration projects:
 - Foch St. from West 7th St. to West 6th St., completed May 2020
 - Foch St. from West 6th St. to West 5th St., completed Sept. 2021
 - Foch St. from the intersection at Foch St. and Azalea Ave. to 196 west of Foch St, completed Jan. 2021
 - Weisenberger from Adrian Dr to Currie St, completed Dec. 2021
 - Pipe Rehabilitation is planned for Merrimac from Mercedes Ave to Carroll St and Carroll St from Merrimac St. to West 5th St., currently in the Bid/Award phase anticipated to go to construction summer of 2023

FEMA Floodplains

100 year FEMA
Floodplains



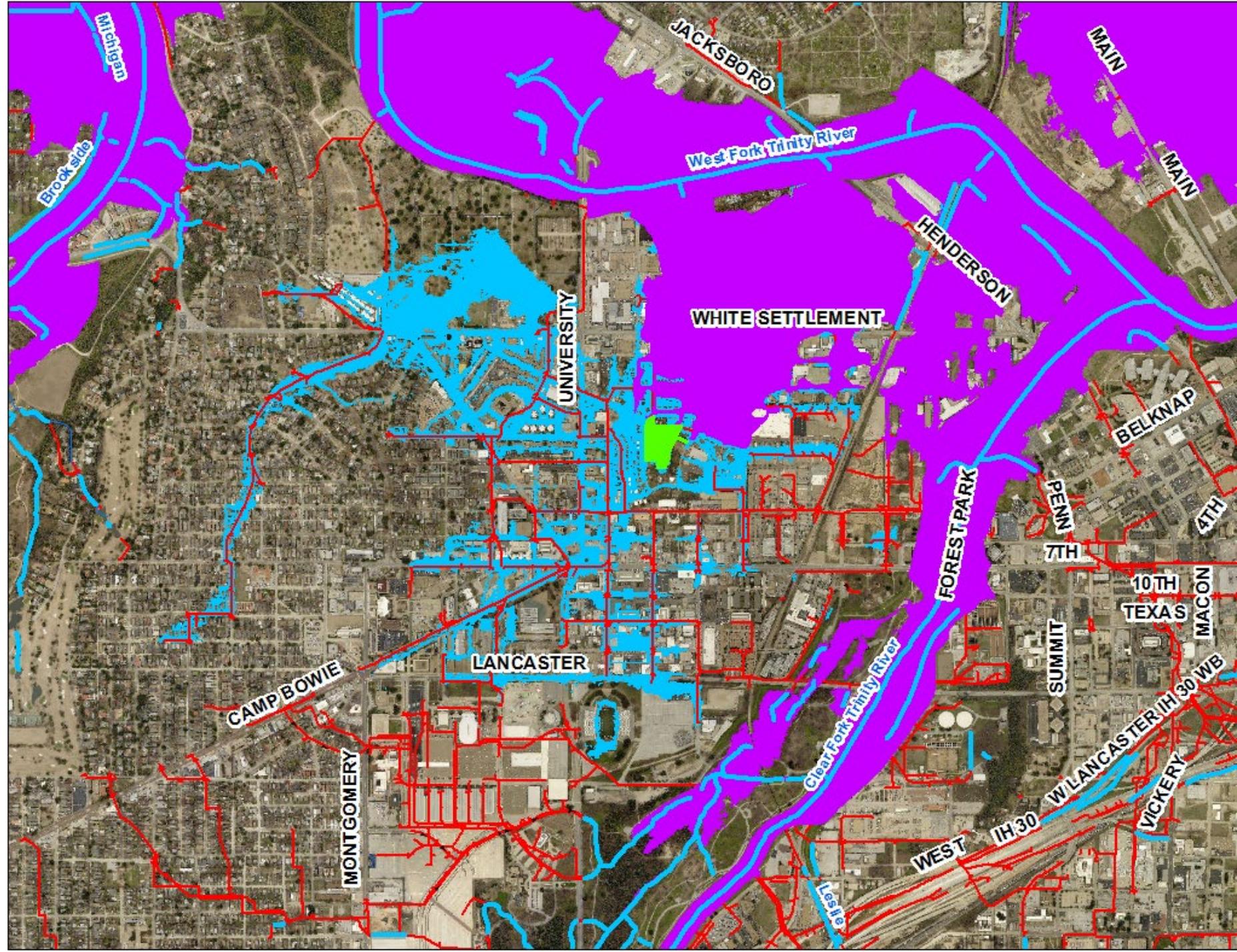
100-yr Non-FEMA Flood Risk

1% chance of occurrence in any given year in any location

Fall 2016 – Fall 2017-

- Mapped flood risk
- Evaluated alternatives to mitigate flooding

-  100 year FEMA Floodplains
-  100 year Non-FEMA Flood Risk

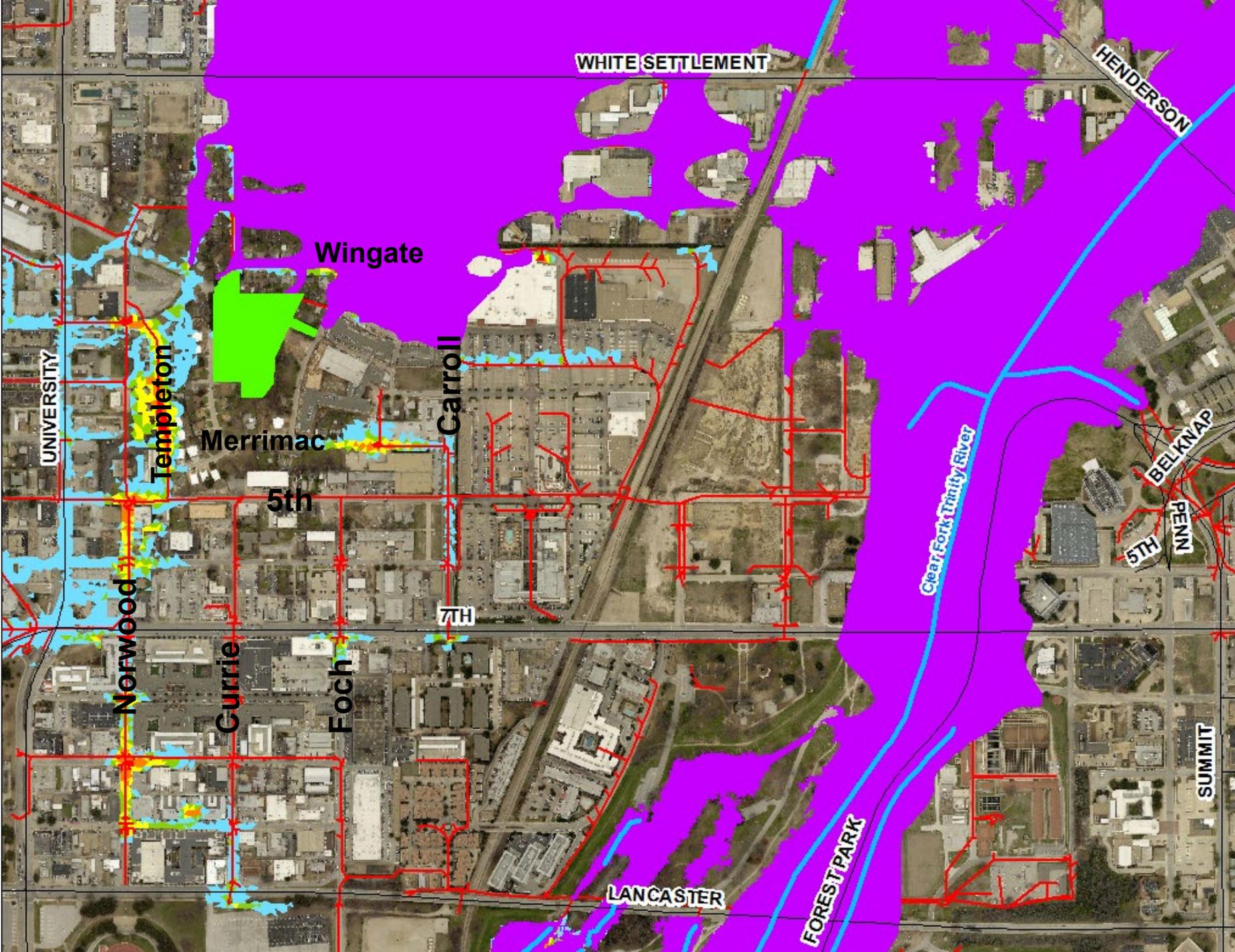


1-yr Non-FEMA Flood Risk

100% chance of occurrence in any given year in any location

Estimated Depth

- 0.083 - 0.600
- 0.601 - 1.000
- 1.001 - 1.500
- 1.501 - 2.000
- 2.001 - 4.229
- 100 year FEMA Floodplains



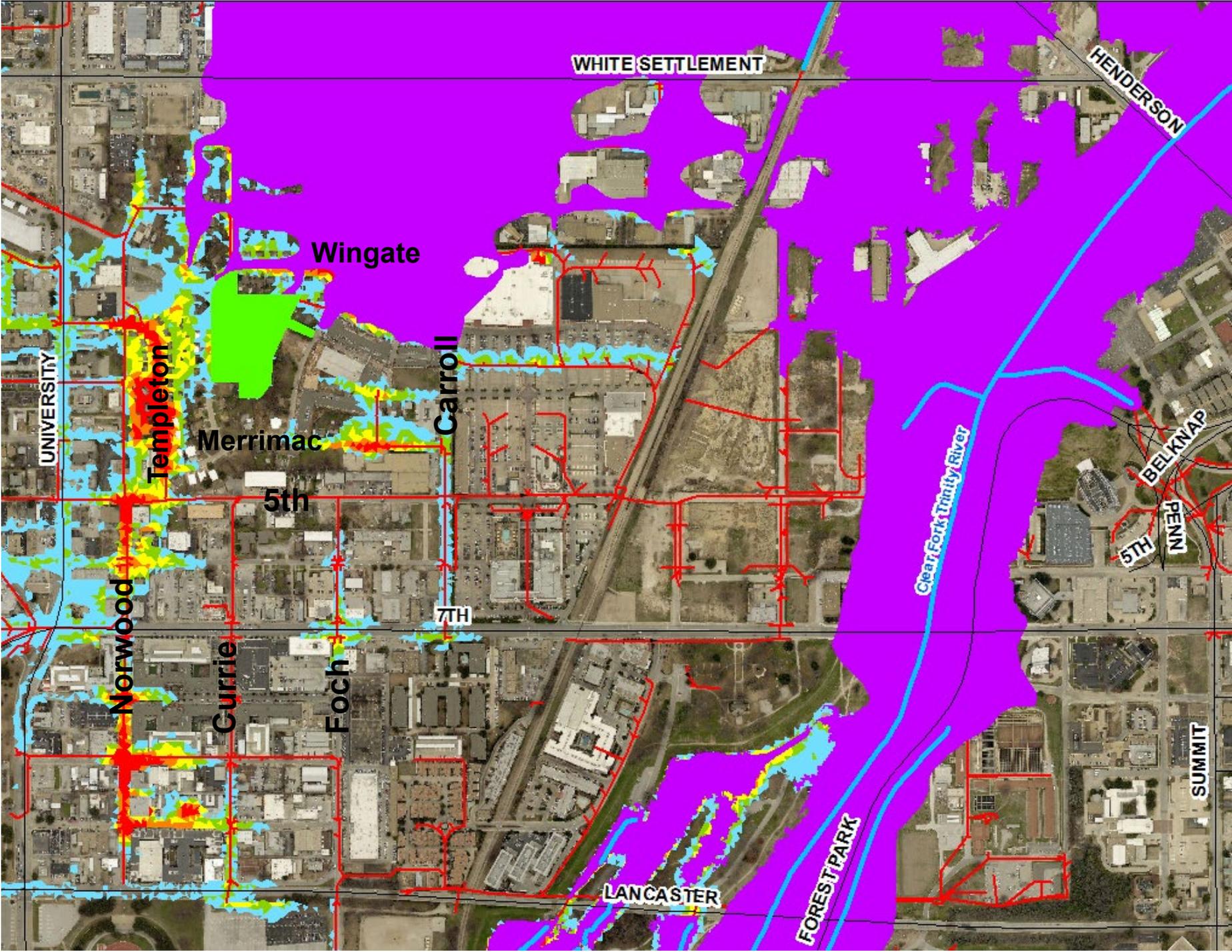
5-yr Non-FEMA Flood Risk

20% chance of occurrence in any given year in any location

Estimated Depth

- 0.083 - 0.600
- 0.601 - 1.000
- 1.001 - 1.500
- 1.501 - 2.000
- 2.001 - 3.000
- 3.001 - 5.452

100 year FEMA Floodplains



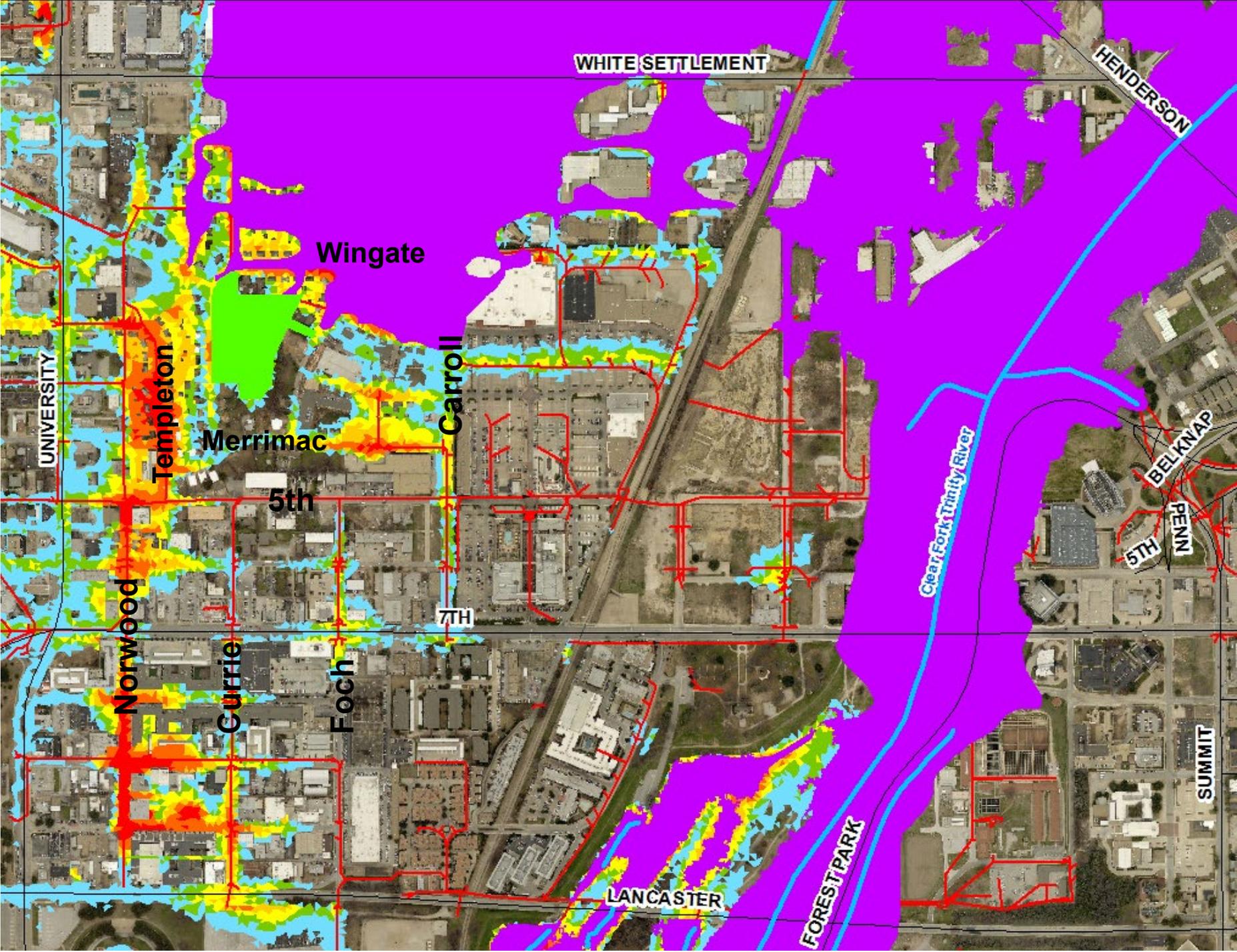
100-yr Non-FEMA Flood Risk

1% chance of occurrence in any given year in any location

Estimated Depth

- 0.083 - 0.600
- 0.601 - 1.000
- 1.001 - 1.500
- 1.501 - 2.000
- 2.001 - 3.000
- 3.001 - 5.452

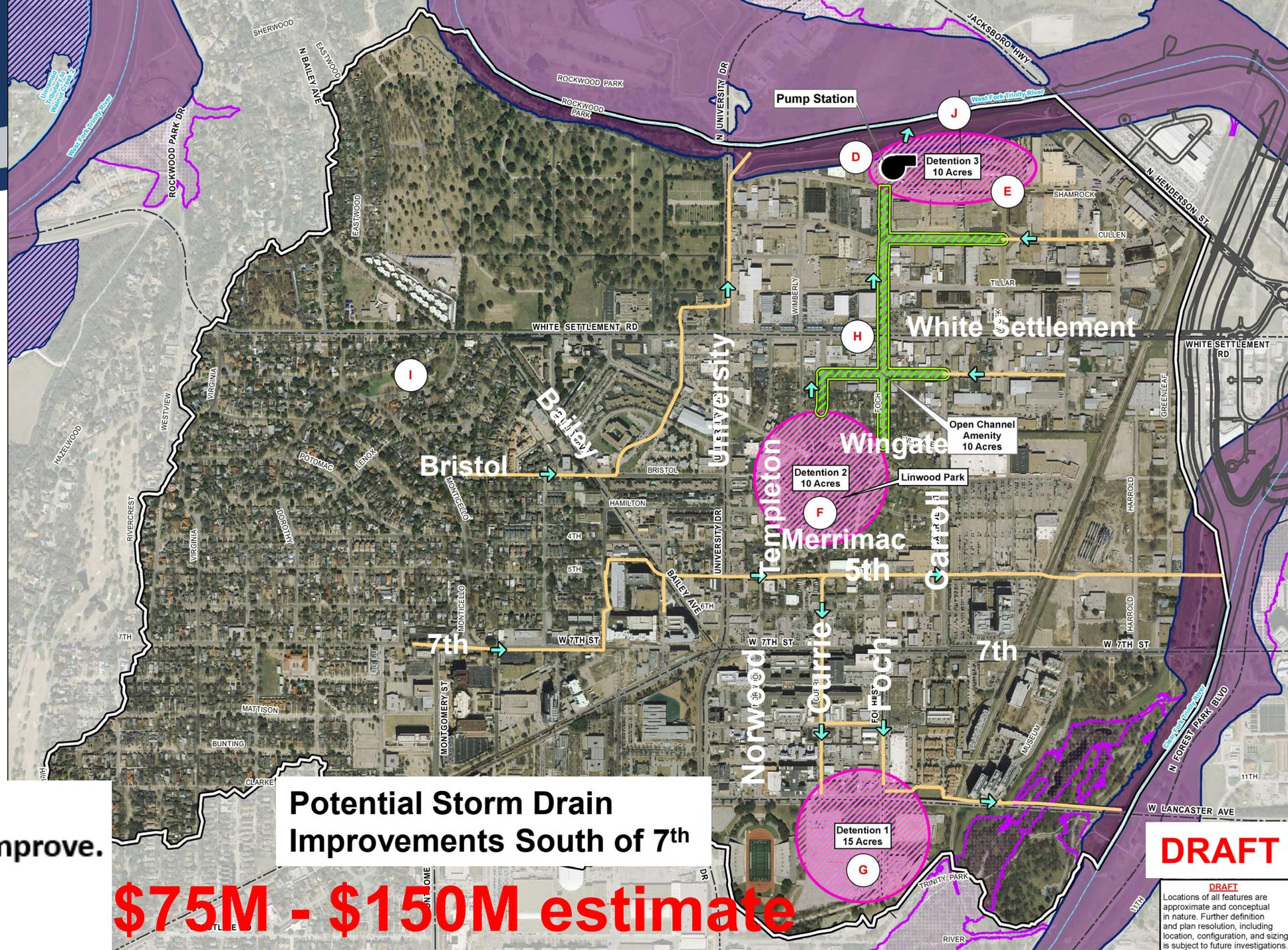
100 year FEMA Floodplains



Mid-Long Term- What Could Be Done?

Conceptual Plan

2014 - 2015 planning



- Potential Open Channel
- Potential Storm Drain Improve.
- Potential Detention
- Potential Pump Station

Potential Storm Drain Improvements South of 7th

\$75M - \$150M estimate

DRAFT

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Locations of all features are approximate and conceptual in nature. Further definition and plan resolution, including location, configuration, and sizing is subject to future investigations.

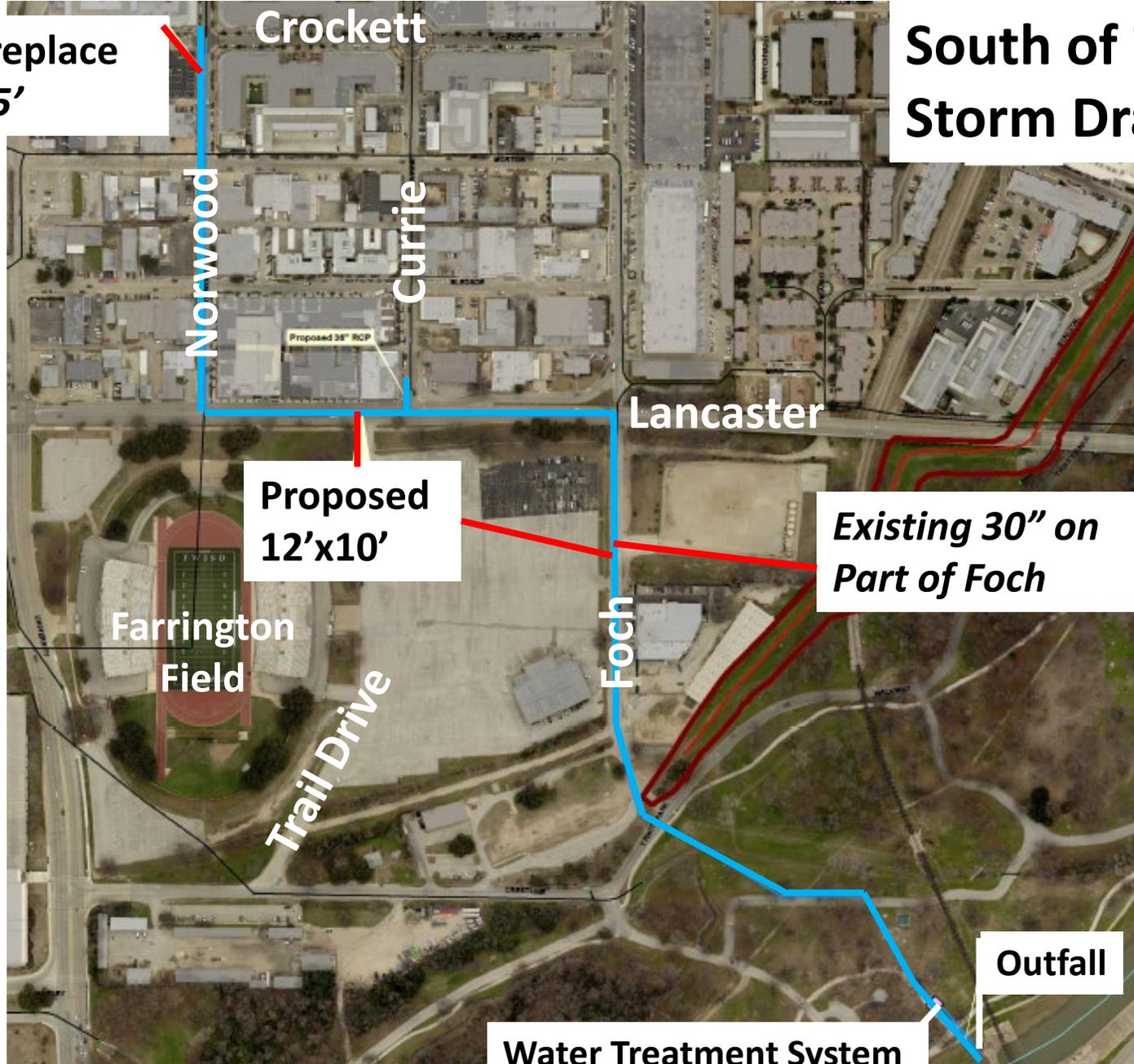
Proposed 6'x6' to replace
Existing 36" & ~4x5'

South of 7th Potential Storm Drain Improvements

Improvements focused on area south of 7th but benefits Linwood in frequent rain events

Trail Dr. Culvert constructed in 2018

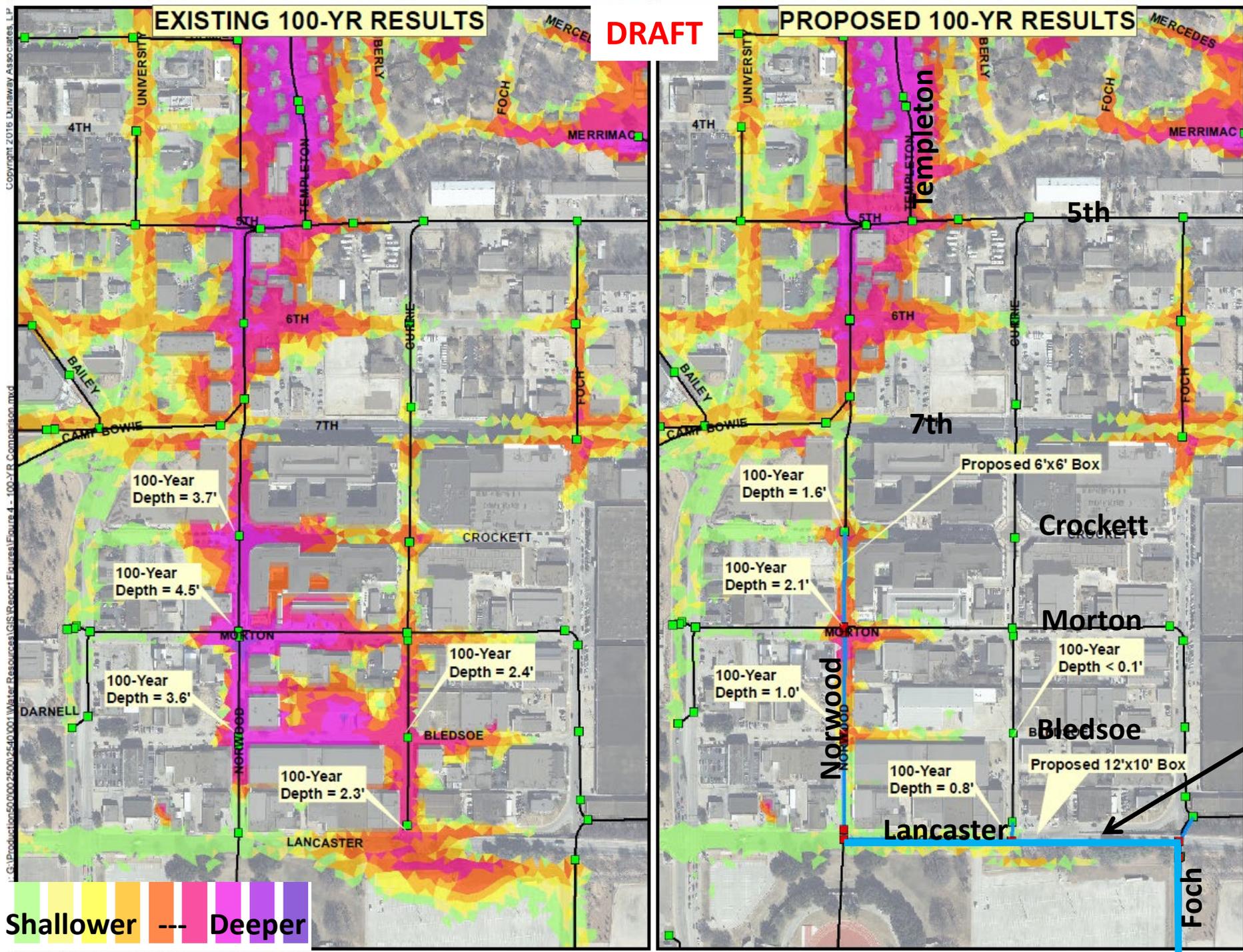
Urban Land Institute Technical Assistance Workshop- Feb. 2022 recognized need for regional stormwater solution & how it could be integrated into the design of the redevelopment of Farrington Field property



2016 – 2017 additional engineering evaluation

Estimated \$15-20 M

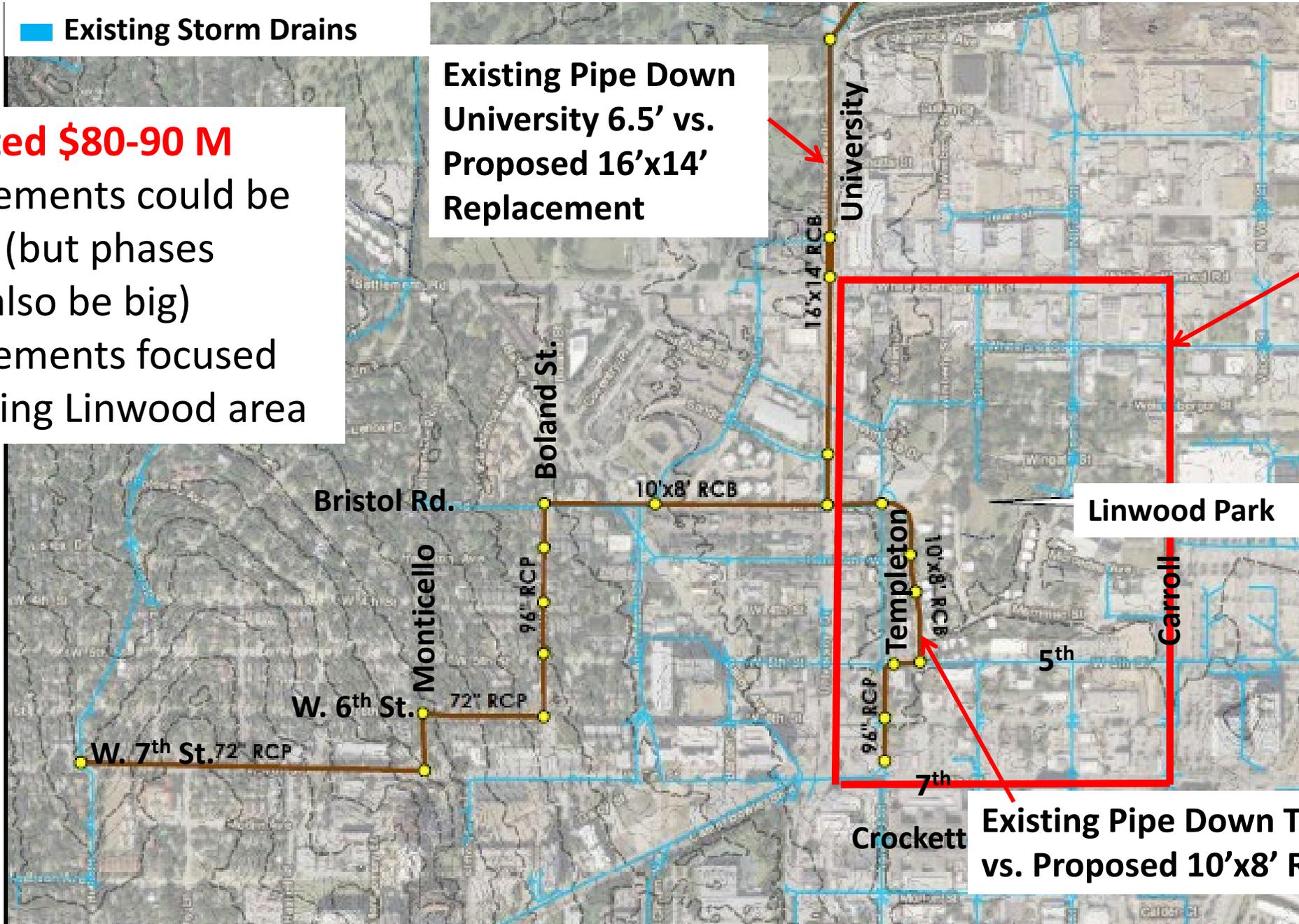
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 Copyright 2015 Dunaway Associates, LP

Potential Storm Drain Improvements West of University & in Linwood

- **Estimated \$80-90 M**
- Improvements could be phased (but phases would also be big)
- Improvements focused on helping Linwood area



Existing Pipe Down University 6.5' vs. Proposed 16'x14' Replacement

Linwood Park

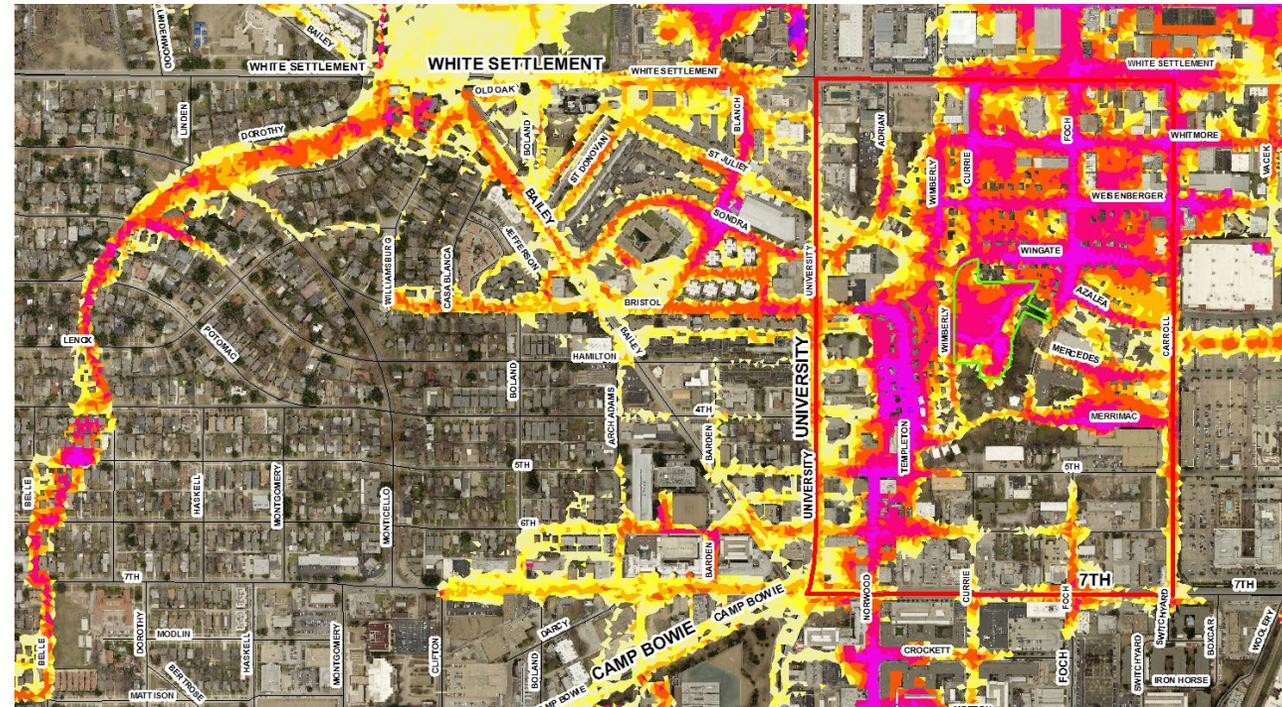
Existing Pipe Down Templeton 2.5' vs. Proposed 10'x8' Replacement

Linwood Neighborhood Association



100 yr Non-FEMA Flood Risk Potential Storm Drain Improvements

■ Potential Storm Drain
Improvements



100 yr Non-FEMA Flood Risk Existing Condition

DRAFT

Short Term- What Can Be Done?

Short Term Actions

- **Maintenance:** system checks pre & post storm events
 - Report flooding and maintenance concerns to the City via the MyFW app or 817-392-1234
- **Non-FEMA Flood Risk Initiative**
 - Improved flood risk mapping will be added to website this fall
 - Improved stormwater regulations and permitting this fall
- Evaluate opportunities for partnerships and parcels that could potentially be used for stormwater detention

Short Term Actions

- **Consider Updated Economic Analysis by Corps of Engineers**
 - Revise previous Corps economic analysis from 1998-2000
 - Study could be short term action but federal projects take years
 - Would require Stormwater funding to partner with Corps or other Federal agency
- Participation in North Central Texas Council of Governments Integrated Transportation and Stormwater Management Initiative to inform decision making

Conclusions

Conclusions

Extensive planning has:

- Mapped flood risk
- Identified what could to be done to mitigate flooding

- Positioned Stormwater to move forward depending on:
 - Citywide priorities
 - Partnership opportunities
 - Resources

Conclusions

- The cost of identified drainage improvements for the Near West Side area is beyond the scale of the Stormwater Program
 - \$100M+ needed to mitigate Linwood flooding
- Stormwater's proposed FY23-27, 5 year Capital Improvement Program allocates ~\$122M toward high priority capital projects
 - Stormwater funding is prioritized based on risk considering citywide flooding problems (life safety focus)
 - Mitigating hazardous road overtopping at creeks/channels
 - Major capacity improvements (\$600 million - \$1 billion)
 - Safety improvements (\$40 million - \$50 million)
 - Rehabilitating aging drainage pipes (condition) and capacity improvements to mitigate flooding to homes and businesses (> \$1 billion need)
 - Restoring highly eroded drainage channels (\$280 million - \$480 million)

Conclusions

- Stormwater Utility Fee main source of funding
 - Stormwater Revenue bonds
 - General Obligation bonds (typically not used for Stormwater improvements)
 - Future Stormwater Utility fee increases and debt issuances will be needed to continue accelerated delivery of high priority capital projects
- Partnerships?
- Potential grant funding for phased improvements
 - Texas Water Development Board State Flood Plan?
 - Federal Emergency Management Agency or US Army Corps of Engineers
- Special drainage district?

Conclusions

- No easy solution to mitigate the flooding
- Would take significant
 - Funding
 - Phasing
 - Consideration of citywide needs and priorities
- Continued maintenance of the existing system
- Rehabilitation of the existing system based on priority
 - To improve condition not capacity
- Review of existing development regulations to identify potential refinements
- Evaluate opportunities for partnerships and parcels that could potentially be used for stormwater detention
- Continued internal discussions with Council

How Residents Can Protect Themselves

- Understand current flood risk
 - City already sends annual letters to many in this area
 - Reference section of <https://oneaddress.fortworthtexas.gov>
 - If questions email Floodplain@FortWorthTexas.gov
- Flood Insurance is recommended and available at a discounted rate to all FW residents
- Floodproofing or structure elevation
- Parking in other areas
- Sign up for severe weather alerts through <http://www.fortworthtexasalerts.gov/> or the CodeRed app

Please raise your hand to talk or use the chat feature to enter your question or comment. Thank you!

Questions



A horizontal black bar containing various meeting controls. From left to right: a microphone icon with the text 'Mute' and a dropdown arrow; a video camera icon with a slash and the text 'Start video' and a dropdown arrow; a share icon with the text 'Share'; a hand-raising icon circled in red; a smiley face icon; an ellipsis icon; a red 'X' icon; an 'Apps' icon with the text 'Apps'; a 'Participants' icon with the text 'Participants'; and a chat icon circled in red with the text 'Chat'.