



# Elm Circle Neighborhood Meeting

## Project #FM-19-E

January 21, 2020

5:30 PM

# Overview

- *Status of Last Meeting*
- *Recommended Plan*
- *Project Timeline*
- *Questions*



# STATUS OF LAST MEETING

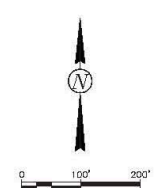
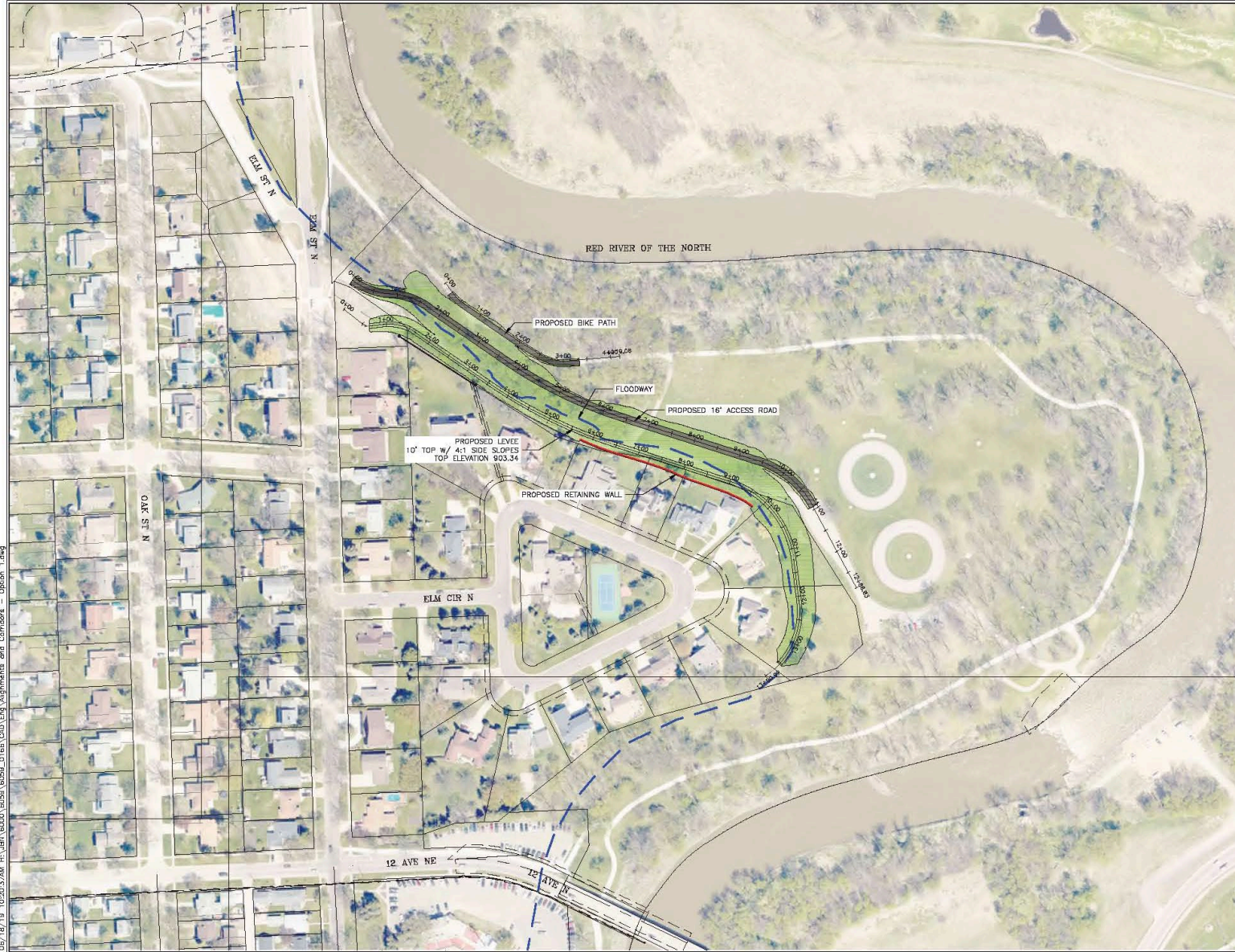
- Public Informational Meeting (9/19/19)
  - Public Comment Period (Until 10/1/19)
- Stake Alignment(s) (9/30/19-10/2/19)
- On-Site Alignment Meetings (10/3/19)
- Revised Preliminary Project Design
  - Public Comments & On-Site Discussions
  - Soil Borings
  - Geotechnical Analysis
  - Hydraulic Analysis
- 2<sup>ND</sup> Neighborhood Meeting (1/21/20)



*Previous Alignment*



# PREVIOUS ALIGNMENT – PRESENTED IN SEPTEMBER




 Proj. No. 6059-0166  
**Houston**  
 Engineering Inc.  
 Ph: 701.237.5065

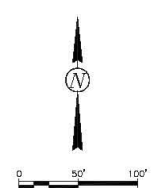
ALL ELEVATIONS ARE BASED ON THE U.S.D.S. VERTICAL DATUM OF 1988 (UNLESS NOTED OTHERWISE)

REVISIONS	
③	①
SEAL	
PRELIMINARY	
<b>Elm Circle</b>	
OPTION 1	

08/16/19 10:20:37AM H:\JRM\6059-0166\6059-0166\CD\Eng\Alignments and Considerations - Option 1.dwg



# PREVIOUS ALIGNMENT – PRESENTED IN SEPTEMBER



**CSI** Proj. No. 6059-0166  
**Houston**  
 Engineering Inc.  
 Ph: 701.237.5065

ALL ELEVATIONS ARE BASED ON  
 THE U.S.S. VERTICAL DATUM OF 1988.  
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REVISIONS		
③	②	①

SEAL

**PRELIMINARY**

**Elm Circle**

OPTION 1

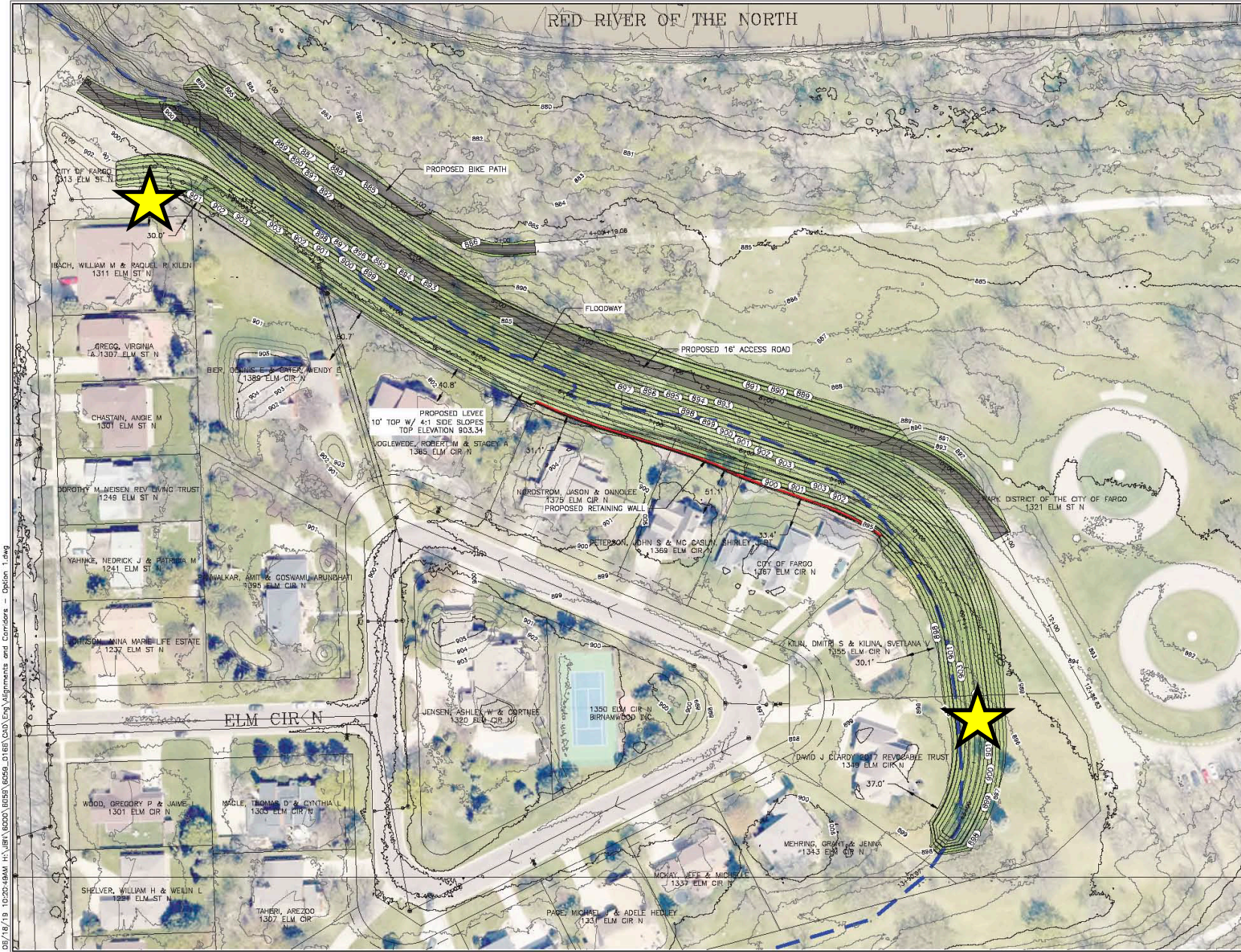
DESIGN BY  
 DRAWN BY  
 CHECKED BY

**THE CITY OF**  
**Fargo**  
 FAR MORE

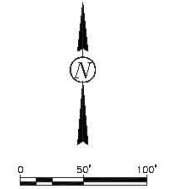
08/16/19 10:20:49AM H:\NVA\6059\0166\CSI\Eng\Alignments and Corridors - Option 1.dwg



# SOIL BORINGS



RED RIVER OF THE NORTH




 Proj. No. 6059-0166  
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REVISIONS	
①	①
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SEAL

PRELIMINARY

Elm Circle

THE CITY OF  
**Fargo**  
 FAR MORE

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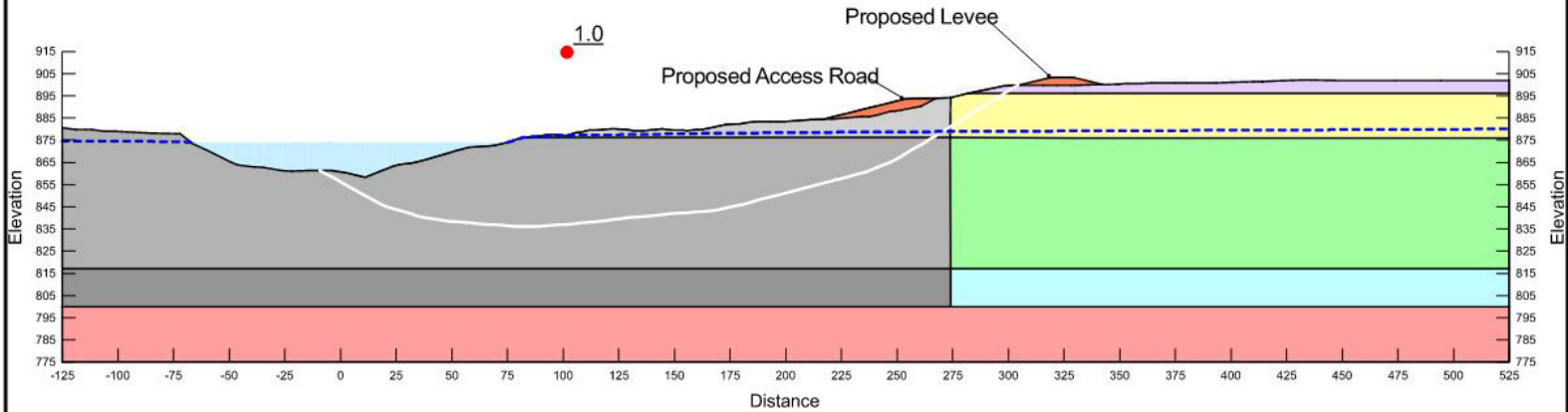


# STABILITY ANALYSIS (LEVEE)

FM-19-E0 Elm Circle (17000+35 Cross Section)  
Braun Intertec Project No. B1905391  
Fargo, North Dakota

Stability Under Normal Conditions (Long-Term Analysis)

**CALCULATED FOS = 1.0**  
**FEMA MIN. FOS = 1.2**



A2 - Normal Conditions (Long-Term)	
B1905391 - Elm Circle 17000+35_HP 12X74 Pile_Alt_with levee.gsz	
01/20/2020	1:842





# *Revised Alignment*





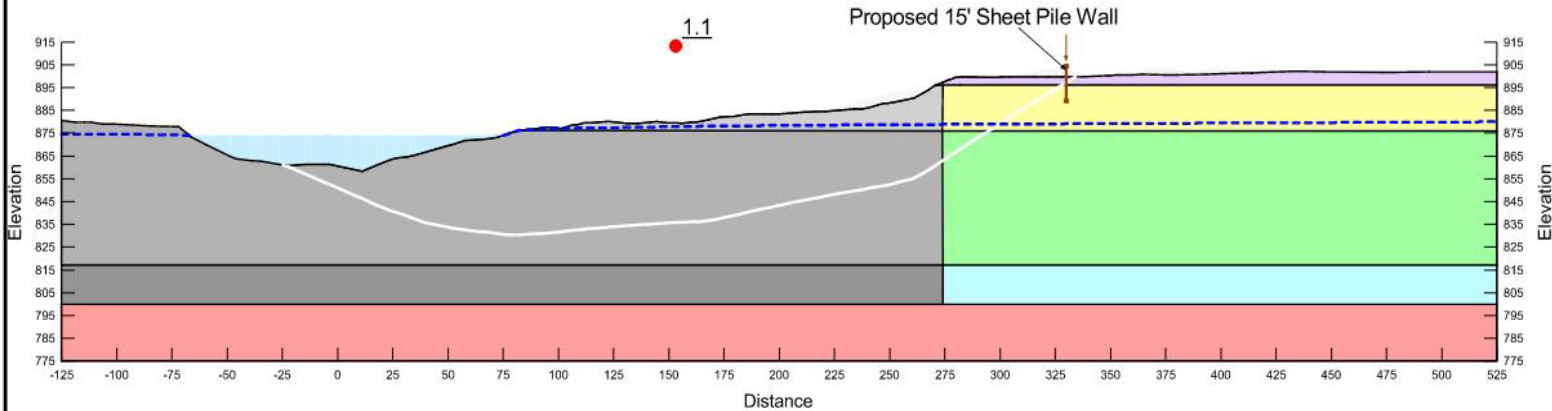


# STABILITY ANALYSIS (SHEET PILE WALL)

FM-19-E0 Elm Circle (17000+35 Cross Section)  
Braun Intertec Project No. B1905391  
Fargo, North Dakota

Stability Under Normal Conditions (Long-Term Analysis)

**CALCULATED FOS = 1.1**  
**FEMA MIN. FOS = 1.2**



A2 - Normal Conditions (Long-Term) (3)

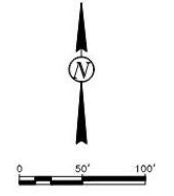
B1905391 - Elm Circle 17000+35\_HP 12X74 Pile\_Alt\_with levee.gsz

01/21/2020

1:842



# RECOMMENDED PROJECT ALIGNMENT




 Proj. No. 6059-0166  
**Houston**  
 Engineering Inc.  
 Ph: 701.237.5065

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REVISIONS	
③	①
②	①

SEAL

PRELIMINARY

Plan View



01/16/20, 04/05/2024, H. WERN, 6000, 6059, 6059\_0166, CAD, Engineering and Condores - Office, Fargo





# *Levee Examples*

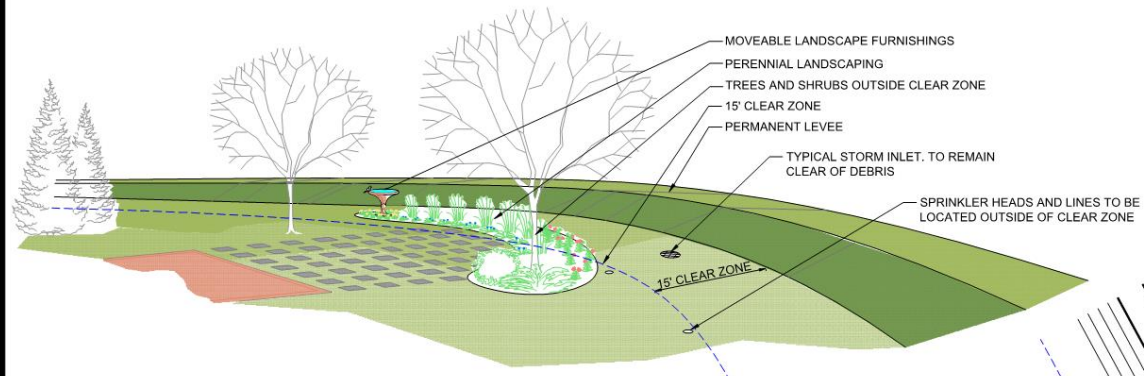


# STANDARD LEVEL EXAMPLE



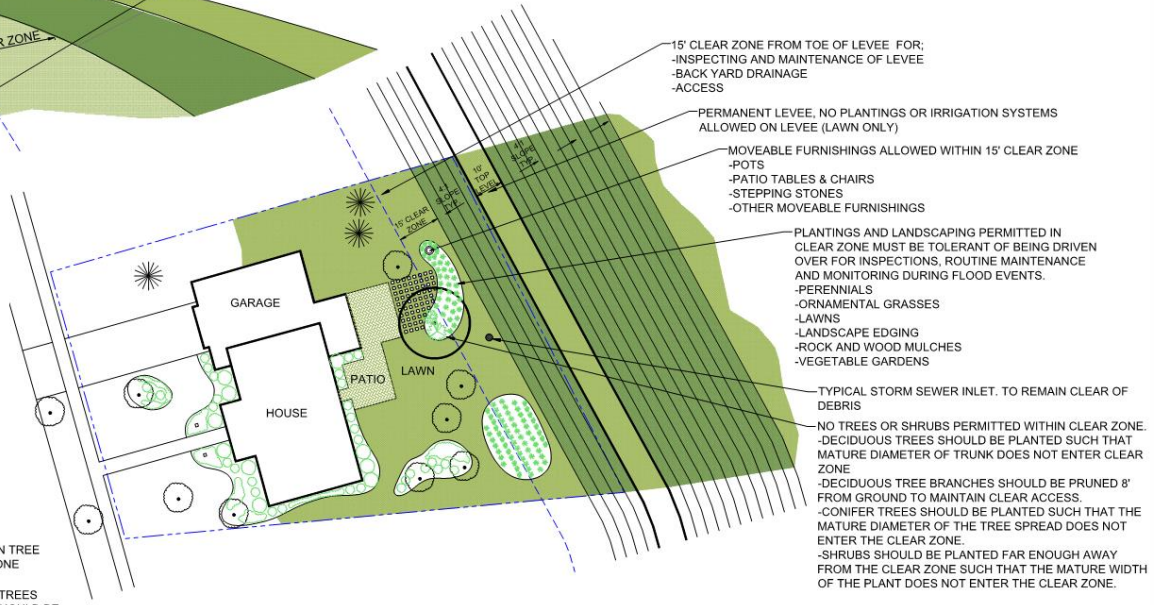


# STANDARD LEVEL ALLOWABLE USE

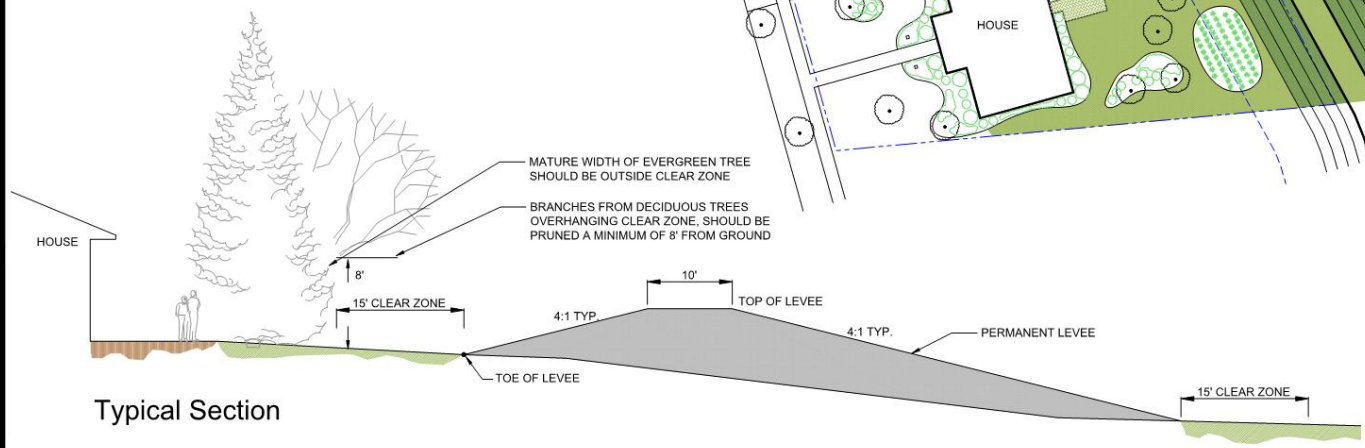


Typical Perspective

**DRAINAGE NOTE:**  
DRAINAGE OF RUNOFF ADJACENT TO FLOODWALLS AND LEVEES IS IMPORTANT IN MAINTAINING THE INTEGRITY OF THE STRUCTURES. AS A RESULT, LANDSCAPING OR OTHER ADDED FEATURES SHOULD NOT CHANGE OR BLOCK THE DESIGN DRAINAGE GRADES AND FLOW PATHS.



Typical Plan View



Typical Section

**Warning:**  
The primary purpose of the identified Clear access along the levees and floodwalls. As obstructions to assure adequate access by routine maintenance, monitoring, and flood-responsible for the repair and/or replacement clear zone area. The City of Fargo will not damage to features within this area result



# MODULAR BLOCK WALL LEVEE EXAMPLE



## Maintenance Process

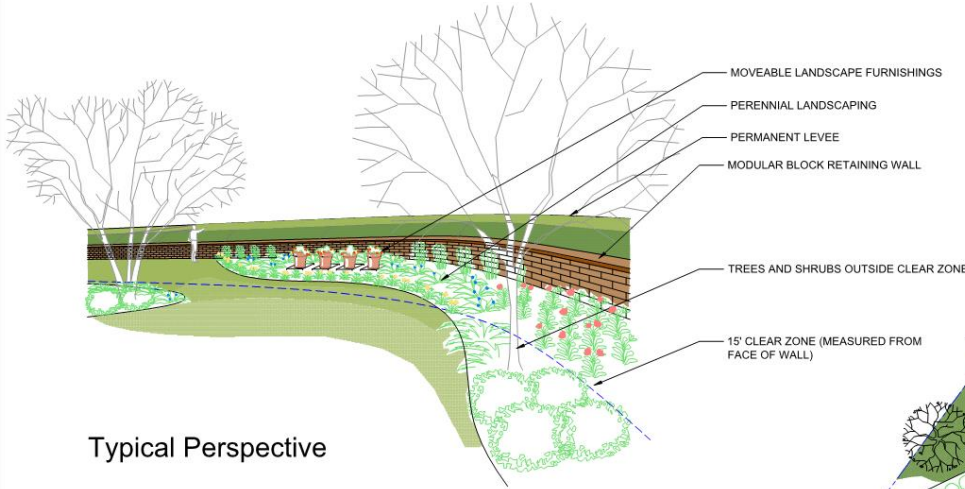
- City responsible to any significant structural integrity related issues...
- Landowner responsible to mow, regular maintenance, cosmetic repairs,...



# MODULAR BLOCK WALL LEVEE ALLOWABLE USE

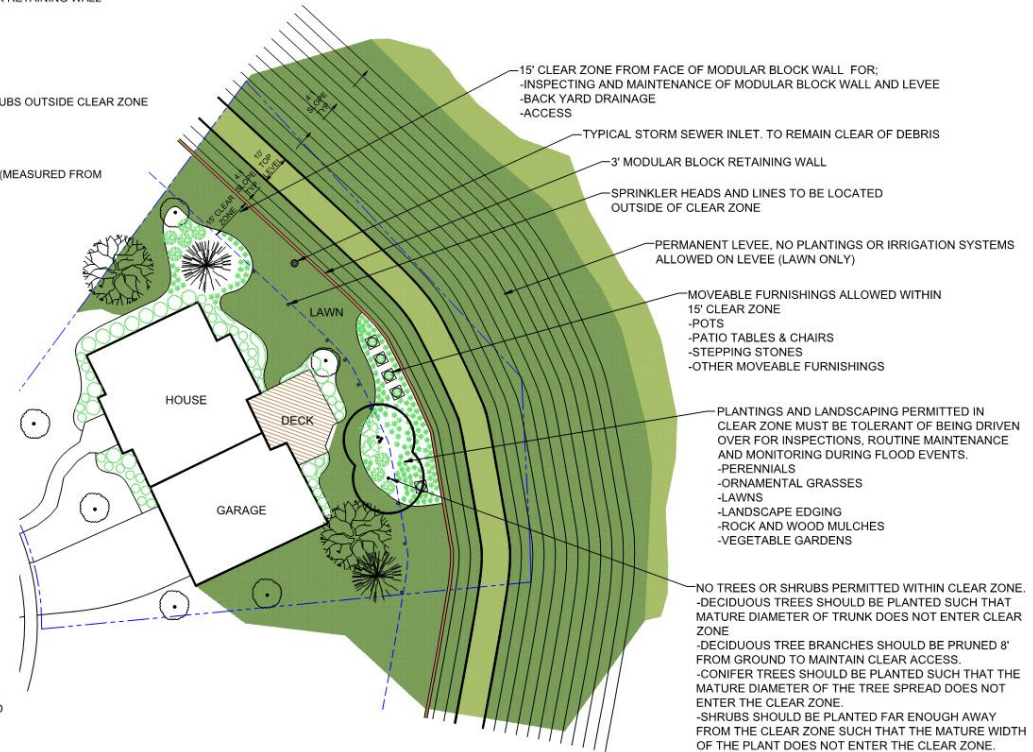
CITY OF FARGO

## STANDARD COMBINATION LEVEE WITH MODULAR BLOCK WALL ALLOWABLE USE EXAMPLE

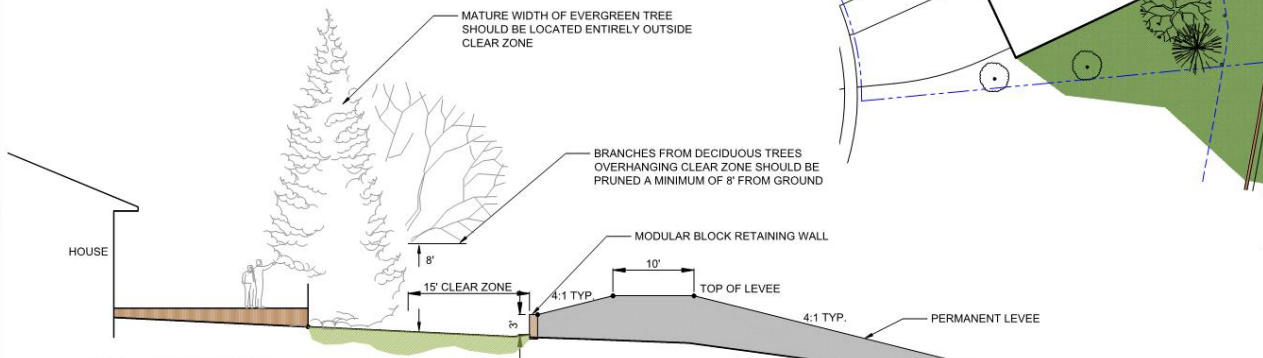


Typical Perspective

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Typical Plan View



Typical Section

**Warning:** The primary purpose of the identified Clear access along the levees and floodwalls. As obstructions to assure adequate access by routine maintenance, monitoring, and flood responsible for the repair and/or replacement clear zone area. The City of Fargo will not be responsible for damage to features within this area resulting from flood events.







# *Path Forward*



# PROJECT TIMELINE

- Public Informational Meeting (9/19/19)
  - Public Comment Period (Until 10/1/19)
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- October – Soil Borings
- Revised Preliminary Project Design
- 2<sup>ND</sup> Neighborhood Meeting – Tonight
- **Present to City Commission at Informational Meeting**
  - **January, 27 2020 @12:00PM**
- **Present to City Commission for Alignment Approval (February 2020)**
- Easement / Acquisition (Winter/Spring 2020)
- ND State Water Commission Review (Spring/Summer 2020)
- Bidding of Construction Project (TBD)
- Anticipated Construction Begins (TBD)
- Substantial Construction Completion (TBD)
- Final Construction Completion (TBD)







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An aerial photograph of a residential neighborhood in winter. The ground is covered in snow, and many trees are bare. Several houses of various colors and styles are visible, along with a road that curves through the area. A blue banner is overlaid across the middle of the image.

# *Questions*







# MODULAR BLOCK WALL LEVEL MAINTENANCE





# MODULAR BLOCK WALL LEVEE EXAMPLE









# MODULAR BLOCK WALL LEVEE EXAMPLE









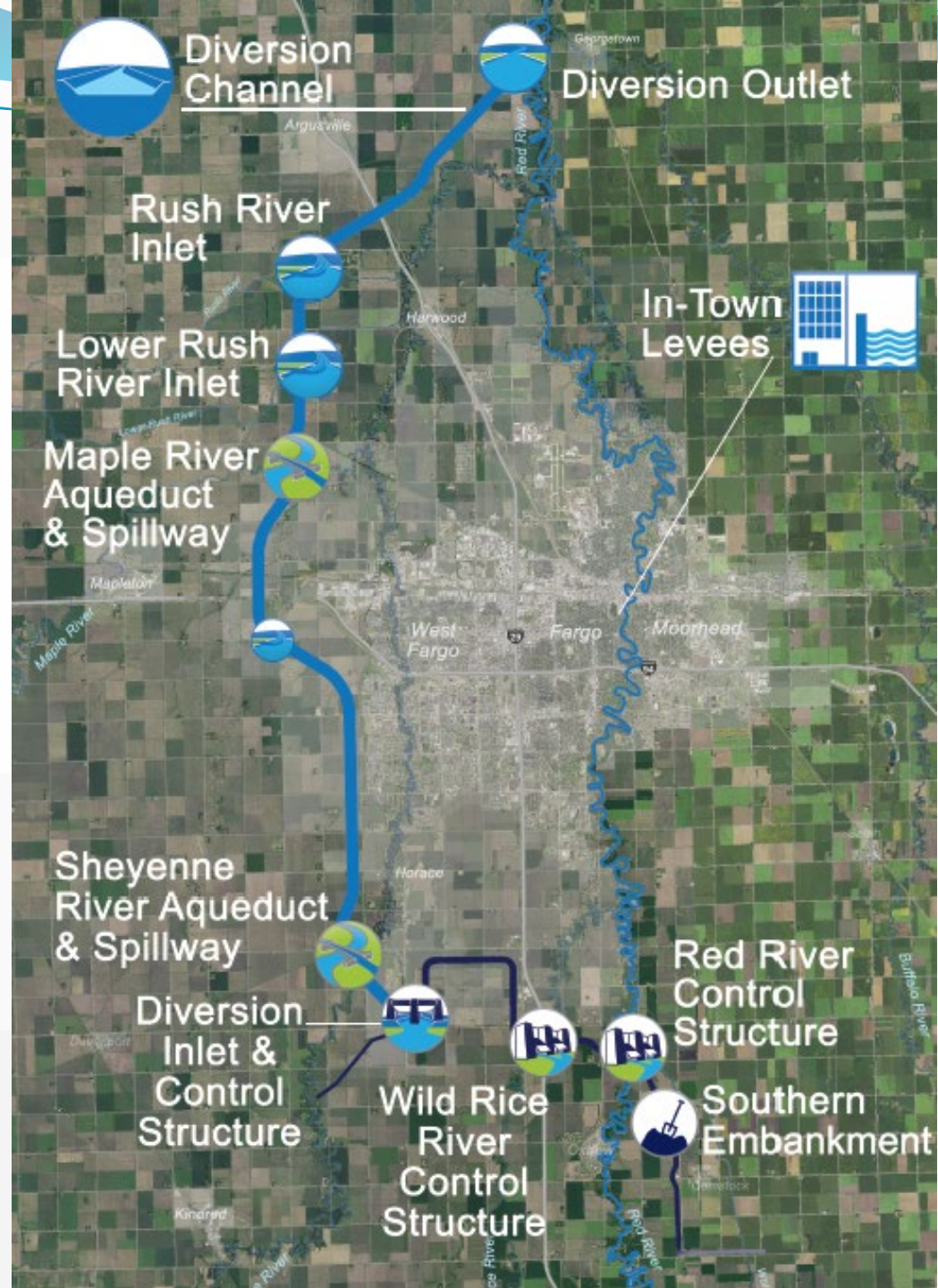


# *FM Diversion*



# Diversion Project “Plan B”

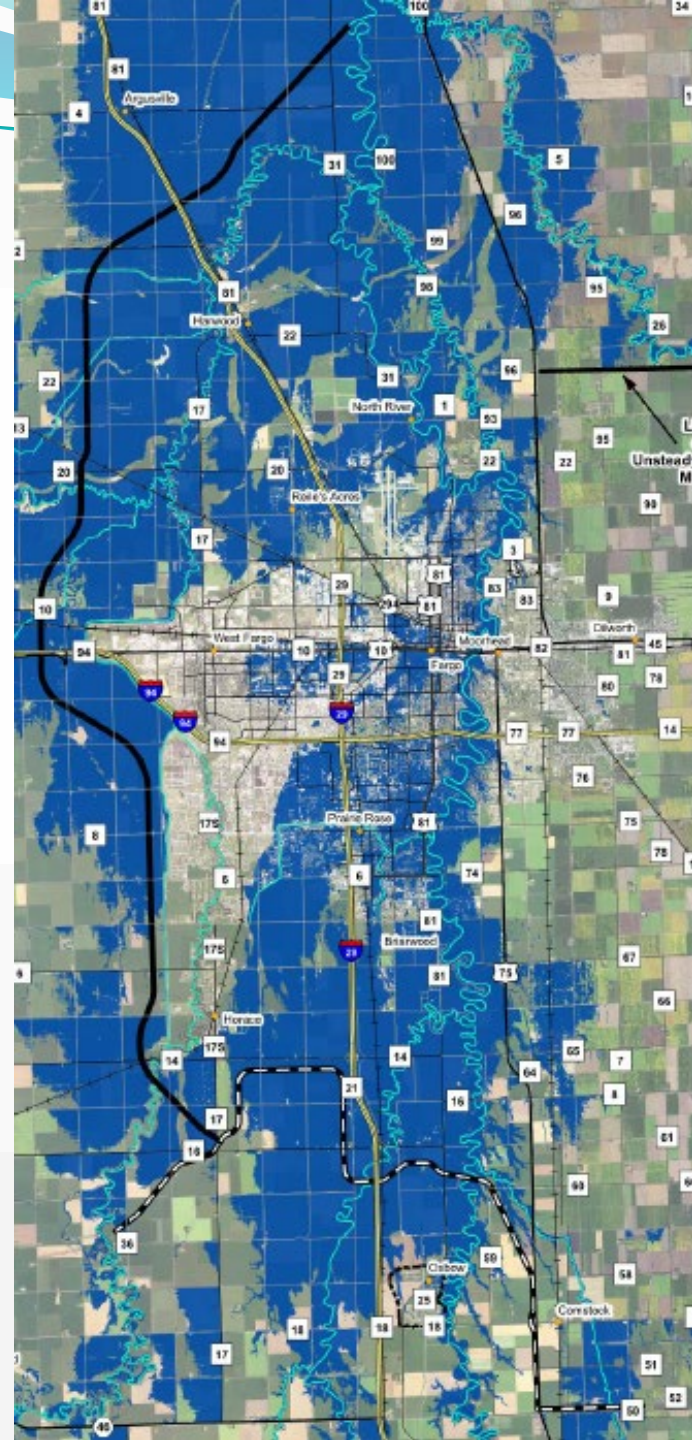
- 100-year Flood Protection Minimum
  - Some features designed to PMF (Probable Maximum Flood) as required by State and Federal Dam Safety Requirements
- Diversion Channel
- Southern Embankment and Control Structures
- Temporary Staging of Flood Waters Upstream to Prevent Downstream Impacts
- In-town Levees
  - Additional levees needed to safely pass RS 37-feet during 100yr flood.





# Existing Conditions

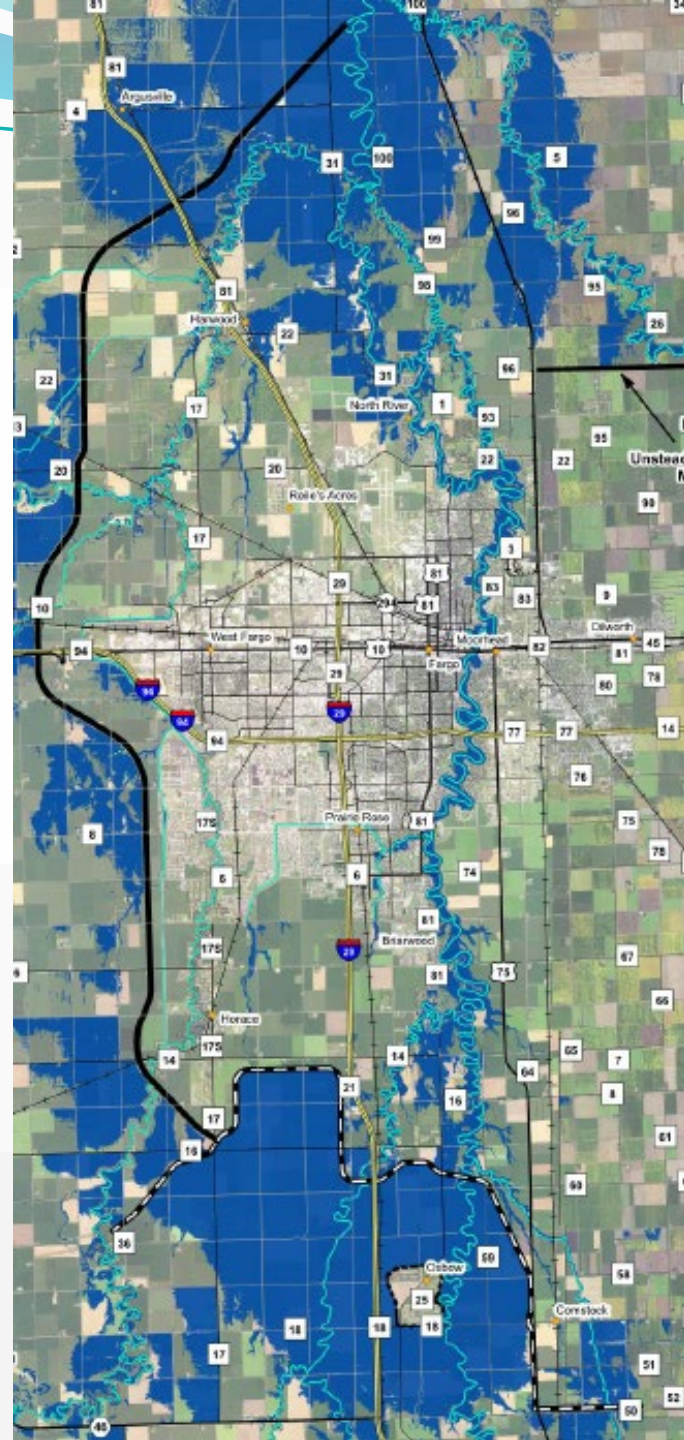
- 100-year floodplain shown in blue





## With Project

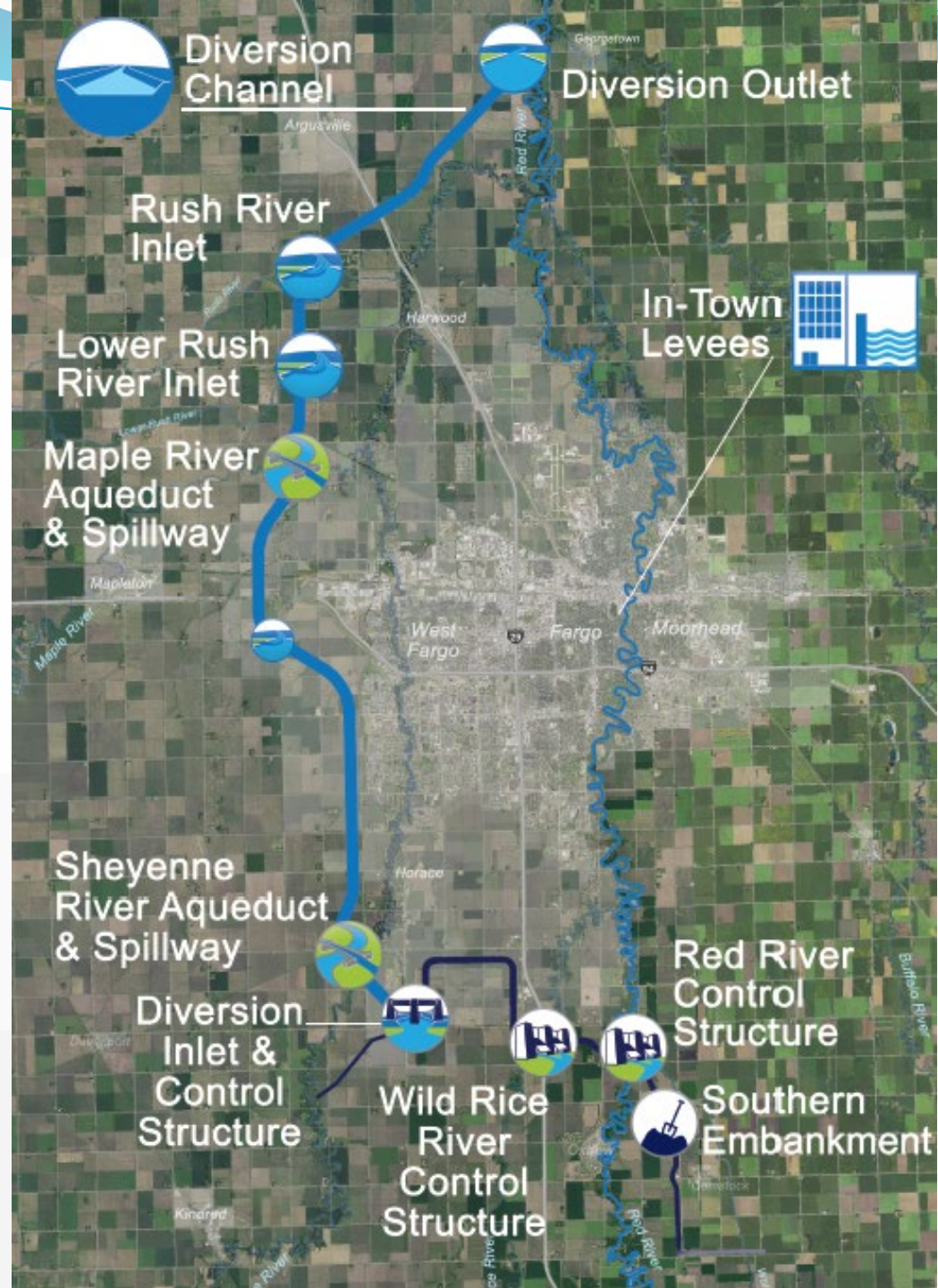
- 100-year floodplain with project shown in blue
- Project also gives the ability to defend against a 500-year flood
  - Would require 18-20 miles of temporary clay and sandbag levees





# Diversion Project “Plan B”

- 100-year Flood Protection Minimum
  - Some features designed to PMF (Probable Maximum Flood) as required by State and Federal Dam Safety Requirements
- Diversion Channel
- Southern Embankment and Control Structures
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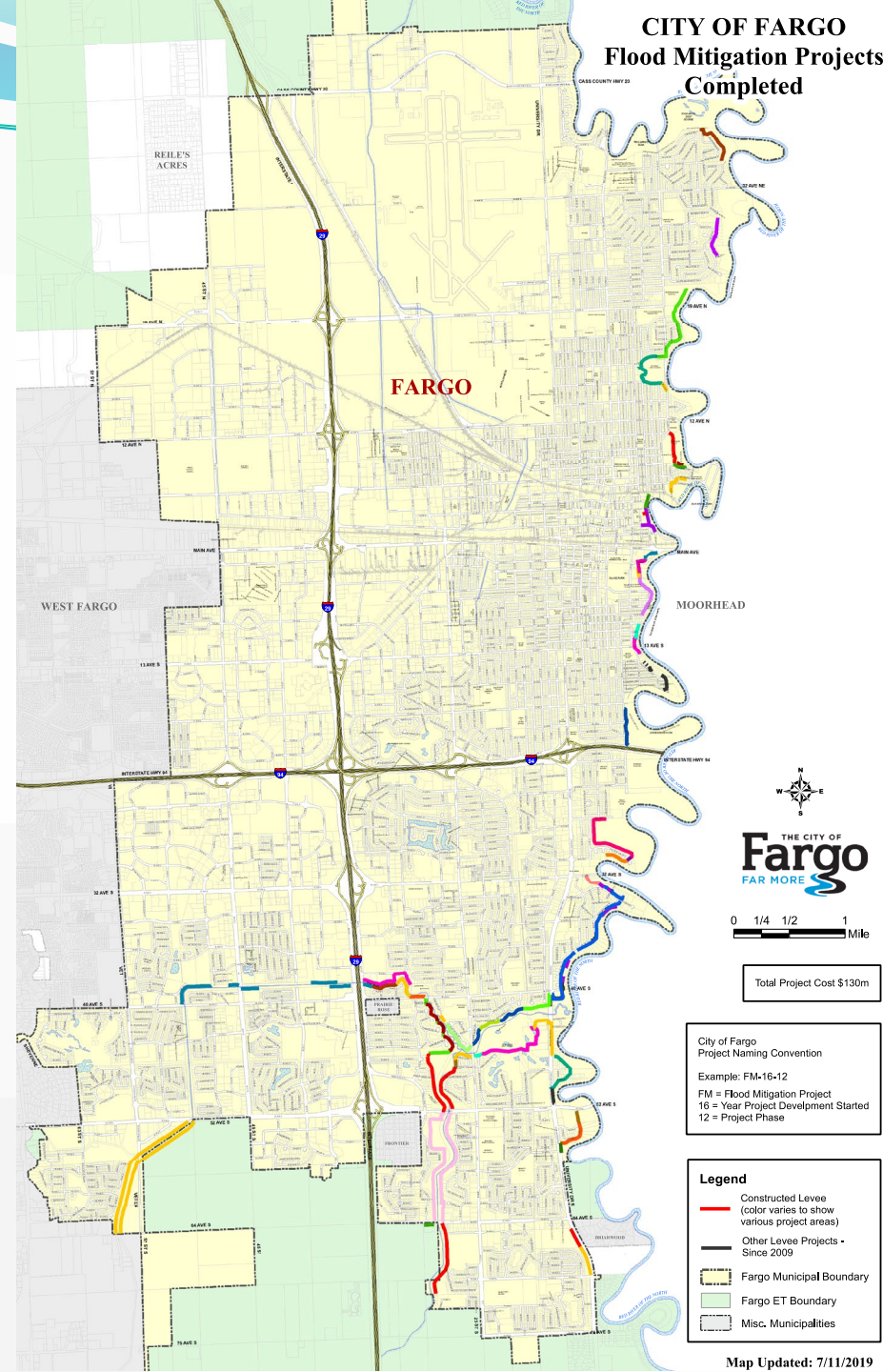
An aerial photograph of a residential neighborhood in winter. The ground is covered in snow, and many trees are bare. A river flows through the lower portion of the image. In the center, a semi-transparent blue banner contains the text "In-Town Projects" in a black, serif font.

# *In-Town Projects*



# PROJECTS COMPLETED SINCE 2009

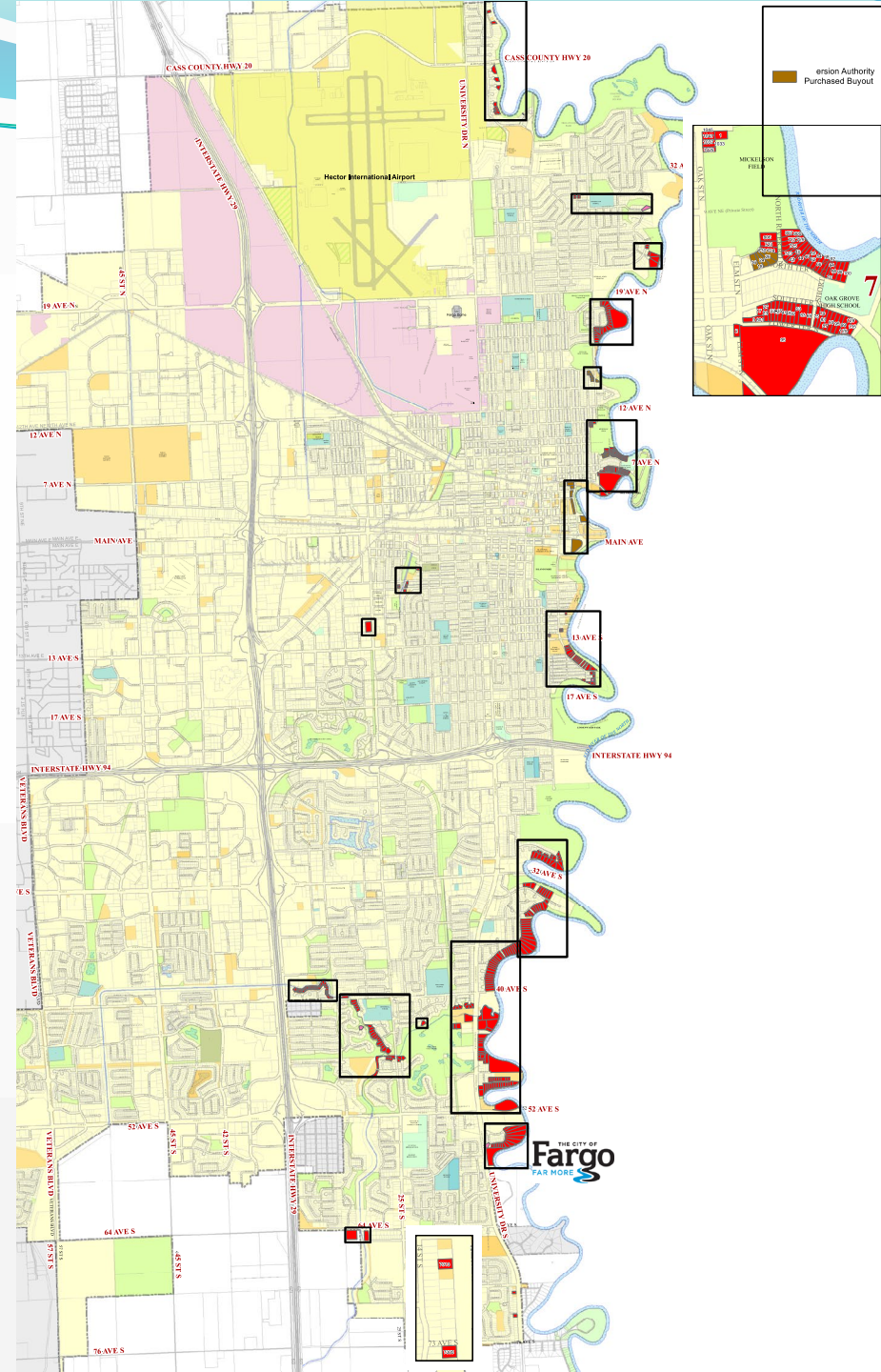
- Constructed over 21 miles
  - \*47 miles of emergency levees constructed by the City in 2009
- Project Cost ≈ \$280 million
- Reduces required sandbags by approximately 5 million
  - Needed over 6 million in 2009
- All completed projects are built to proper elevations to accommodate Plan B's proposed 37' flow thru town





# PROJECT ACQUISITIONS SINCE 2009

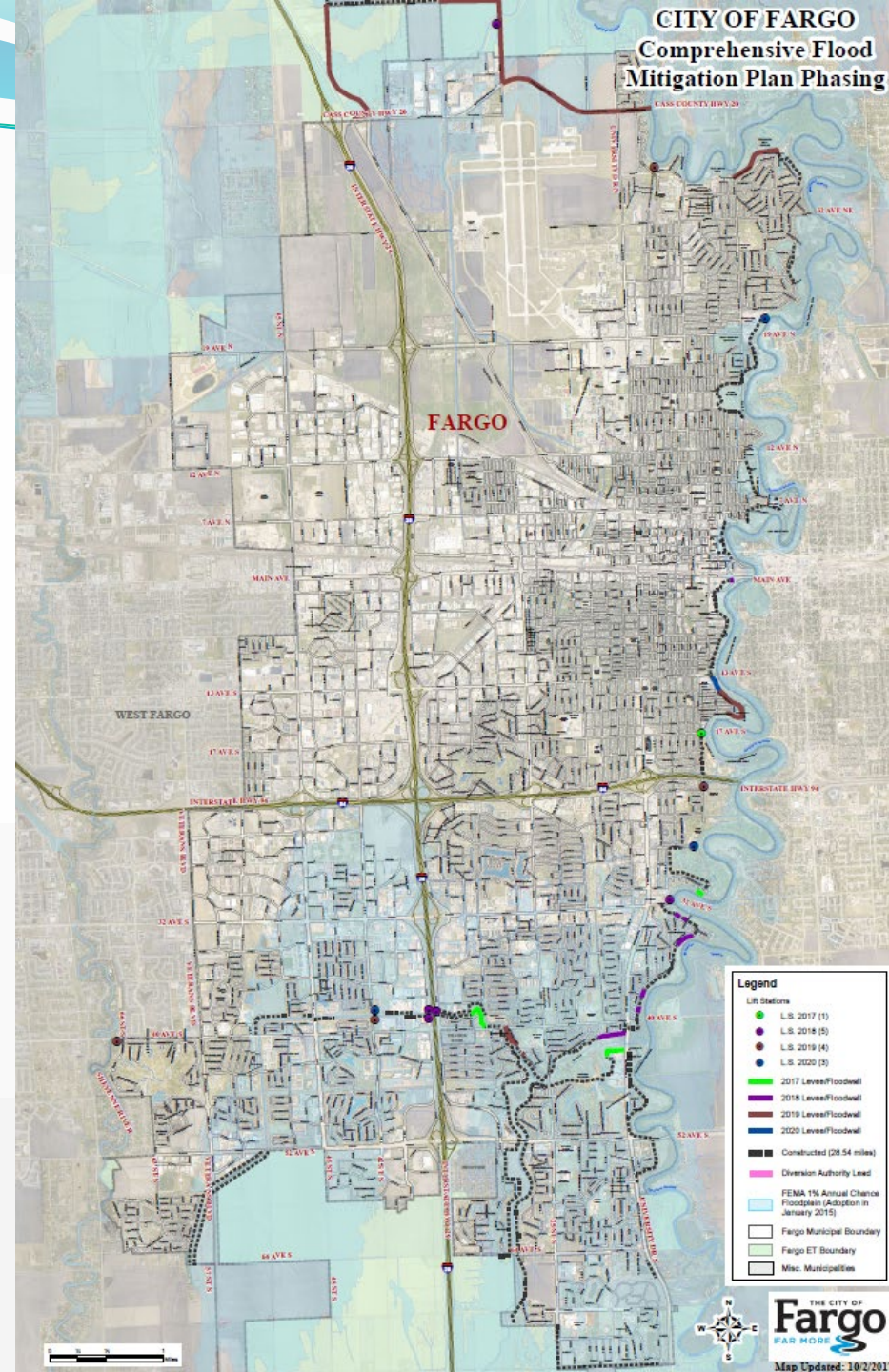
- 245 Properties Purchased
  - Over 380 since 1990
- At cost of over \$100 million
- Approximately 90 private property easement purchased





# 2019 PROJECTS UNDER CONSTRUCTION

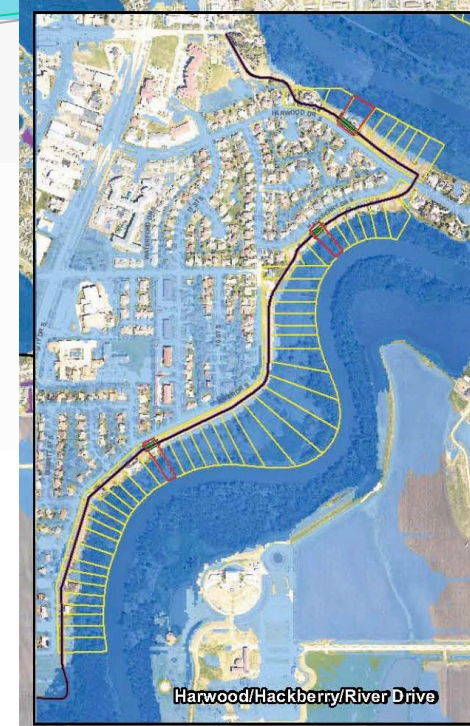
- Four Projects
  - Rosewood Addition – Final Phase
  - Oakcreek & Copperfield Ct – Final Phase
  - Belmont Park – 2<sup>nd</sup> Phase
  - 2<sup>nd</sup> Street S & Main Ave – Final Phase
- Total Length ≈ 0.75 mile
- Total Construction Cost ≈ \$15.7M





# REMAINING PROJECTS

- 2016 Revised Comprehensive Plan Projects
  - Harwood, Hackberry & River Drives
    - 3 Acquisitions Remain
    - Levee Construction
  - Belmont Park
    - 3 Acquisitions Remain
    - Levee & Floodwall Construction
    - Water Intake Building Modifications
  - Drain 10/Airport Area
    - Levee Construction
    - Storm Sewer Lift Station Replacement
  - Storm Sewer Lift Stations Improvements

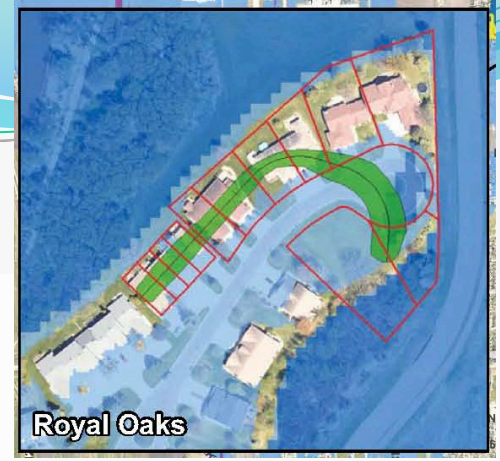




# REMAINING PROJECTS

- Plan B Additional In-Town Projects

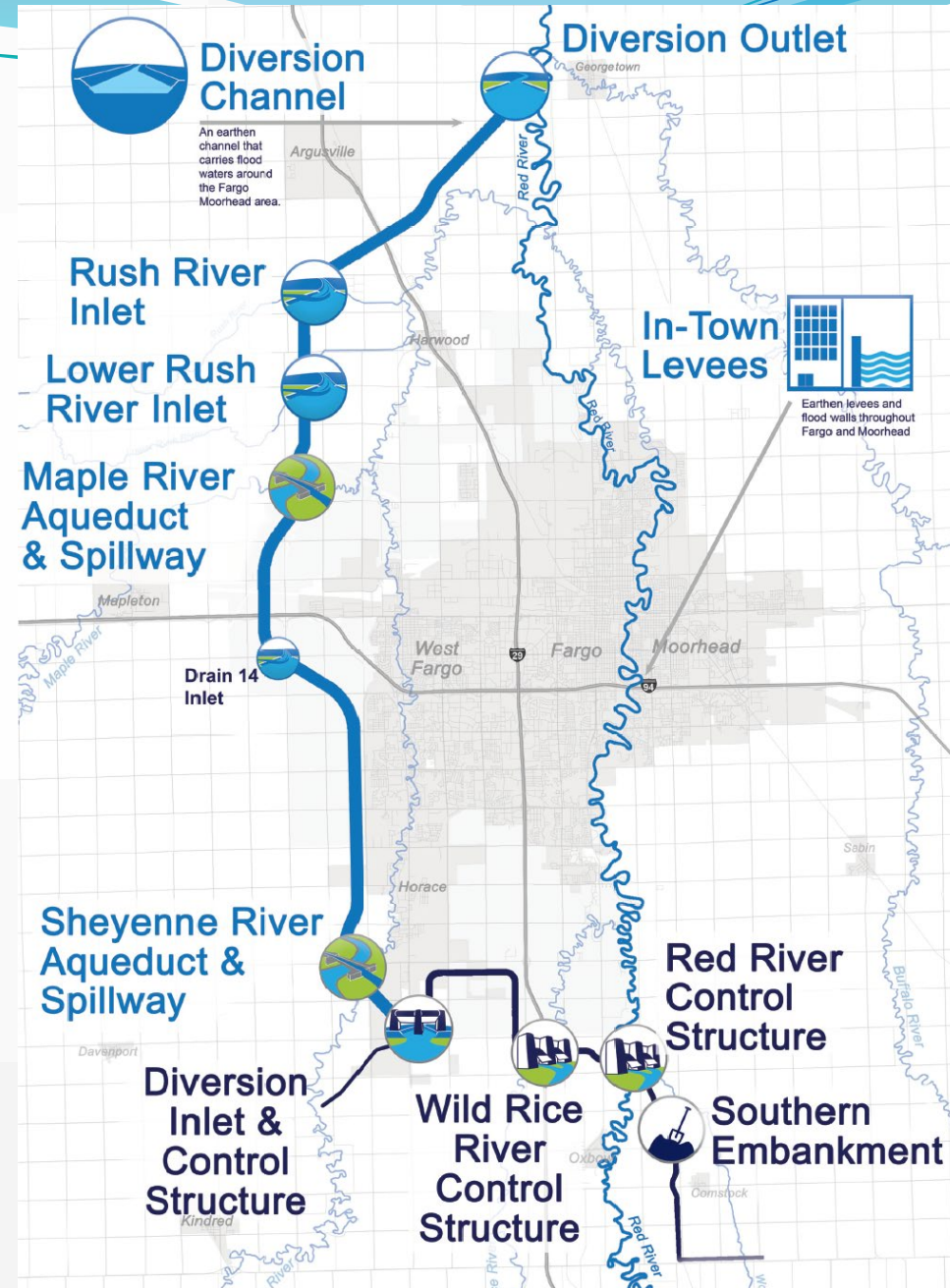
- Riverwood Addition
  - Potential Acquisitions
  - Levee Construction
  - Storm Sewer Lift Station Replacement
- Royal Oaks
  - Potential Acquisitions
  - Levee Construction
- Woodcrest
  - Potential Acquisitions
  - Levee Construction
  - Storm Sewer Lift Station Replacement
- Elm Circle
  - Potential Acquisitions
  - Levee Construction
- Oak Grove
  - Potential Acquisitions
  - Levee Construction
- Storm Sewer Lift Stations Improvements





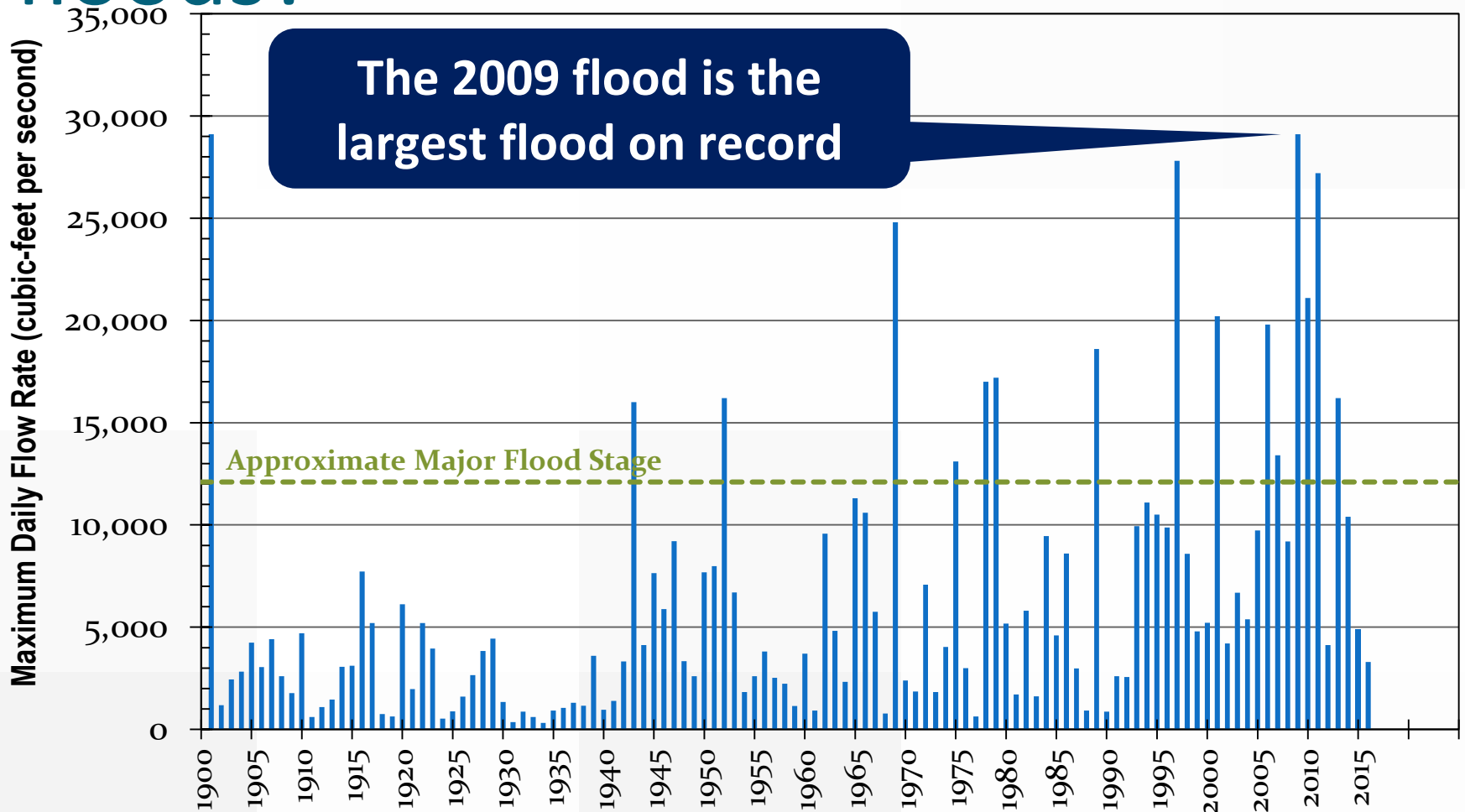
# FM Diversion Project Status

- 2019-2021 Biennium Goals
  - Continue USACE construction and design (dark blue)
  - Continue Plan B In-Town flood protection
  - Acquire all lands for Diversion Channel by Spring-2020
  - Bid the P3 and lock-in the costs
  - Pursue and obtain long-term loans
  - Prepare funding request for 2021 legislative session





# Do you plan for past or future floods?



Source: USGS river flow data from USGS Station

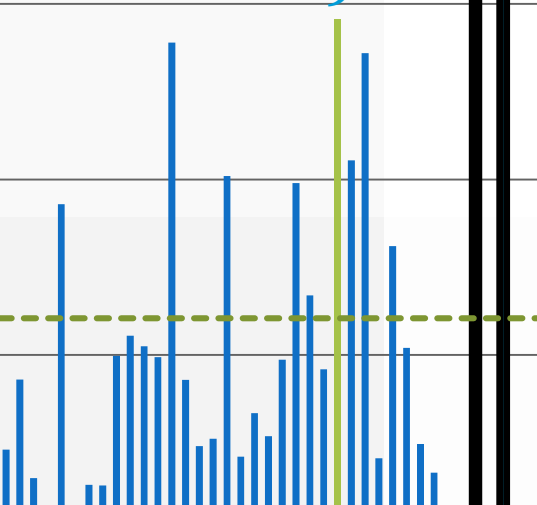


# Understanding the flood threat

500-Year  
Flood Event

100-Year  
Flood Event

2009



## The real threat

A 100 year or 500 year event, the size of which we have never seen before

**Minot 2011**

~450-year event

**Grand Forks 1997**

~250-year event