



Elm Circle Neighborhood Meeting

Project #FM-19-E

January 21, 2020

5:30 PM



Overview

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

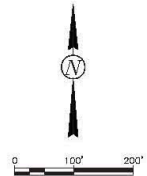
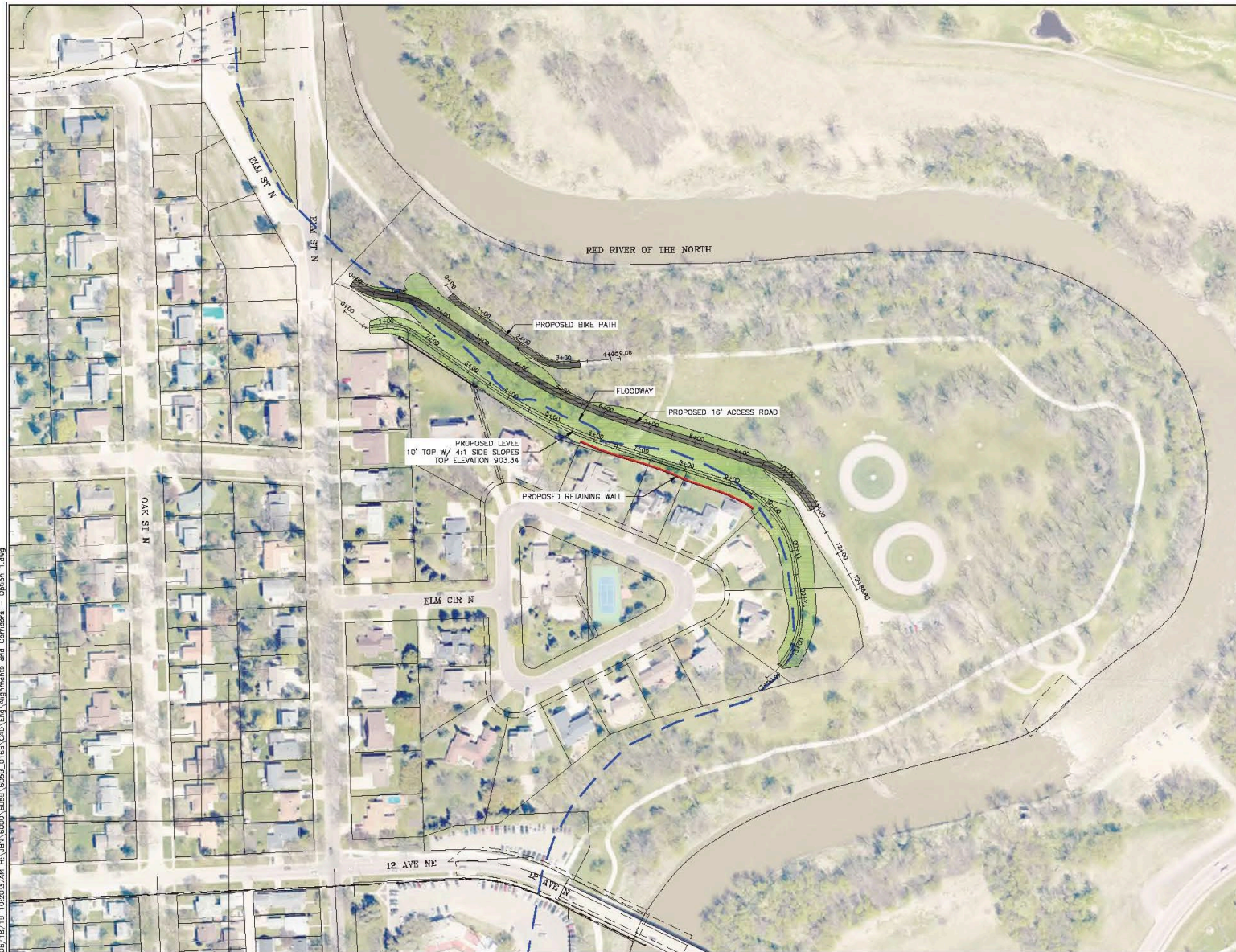
STATUS OF LAST MEETING

- 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
- 2ND Neighborhood Meeting (1/21/20)

An aerial photograph of a residential neighborhood in winter. The ground is covered in a thick layer of snow. Several houses with snow-laden roofs are visible, including a prominent red house and a larger brick house. Bare trees are scattered throughout the landscape. In the foreground, a wide river flows, its surface reflecting the sky and the surrounding trees. A blue banner with white text is overlaid across the middle of the image.

Previous Alignment

PREVIOUS ALIGNMENT – PRESENTED IN SEPTEMBER

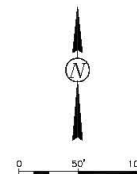
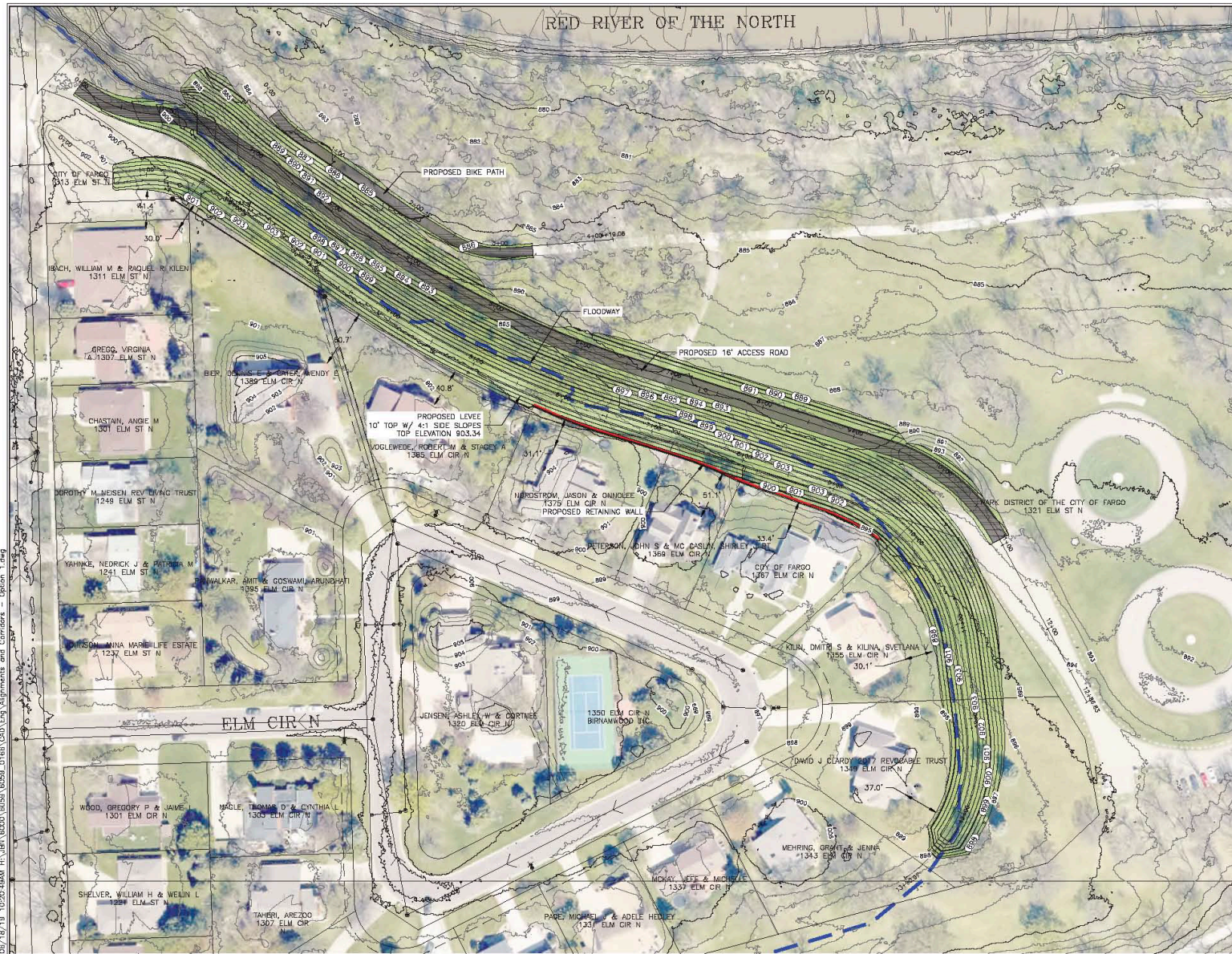



 Proj. No. 6059-0166
Houston
 Engineering Inc.
 Ph: 701.237.5065

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

REVISIONS		
③	②	①
SEAL		
PRELIMINARY		
Elm Circle		
OPTION 1		

PREVIOUS ALIGNMENT – PRESENTED IN SEPTEMBER



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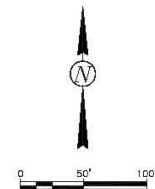
REVISIONS		
(3)	(2)	(1)
SEAL		
PRELIMINARY		
Elm Circle		
OPTION 1		

Elm Circle

OPTION 1



06/18/19 10:20:49AM H:\JEN\6000\BDSB\6050_0165\CAD\Eng\Alignments and Corridors - Option 1.dwg



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REVISIONS		
③	②	①
SEAL		

PRELIMINARY

Elm Circle

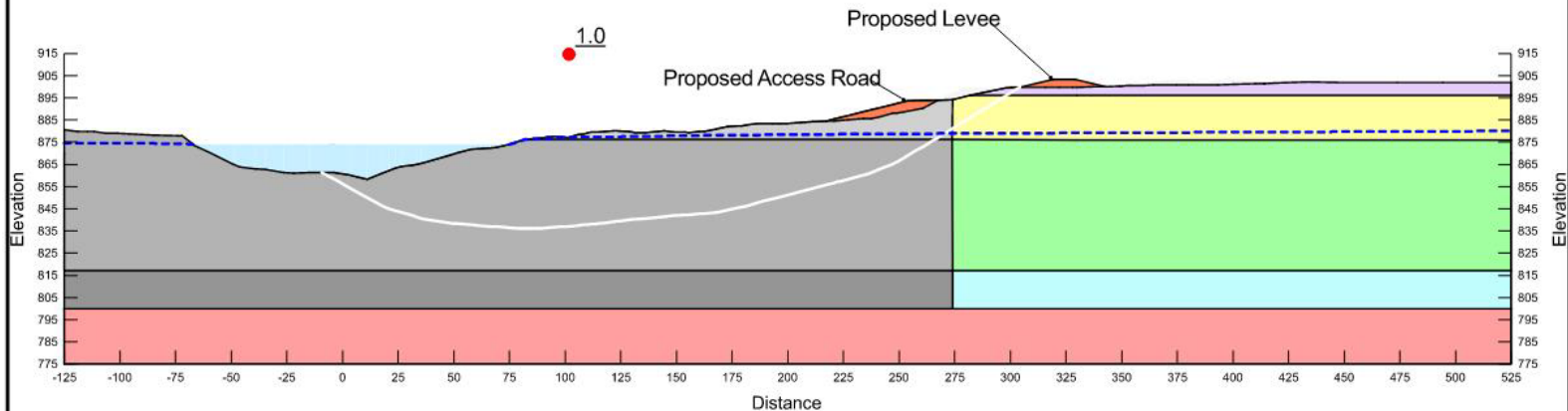
THE CITY OF
Fargo
FAR MORE 

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

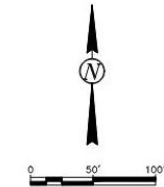
01/20/2020

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Revised Alignment

SHEET PILE WALL OPTION



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REVISIONS

SEAL

PRELIMINARY

Elm Circle

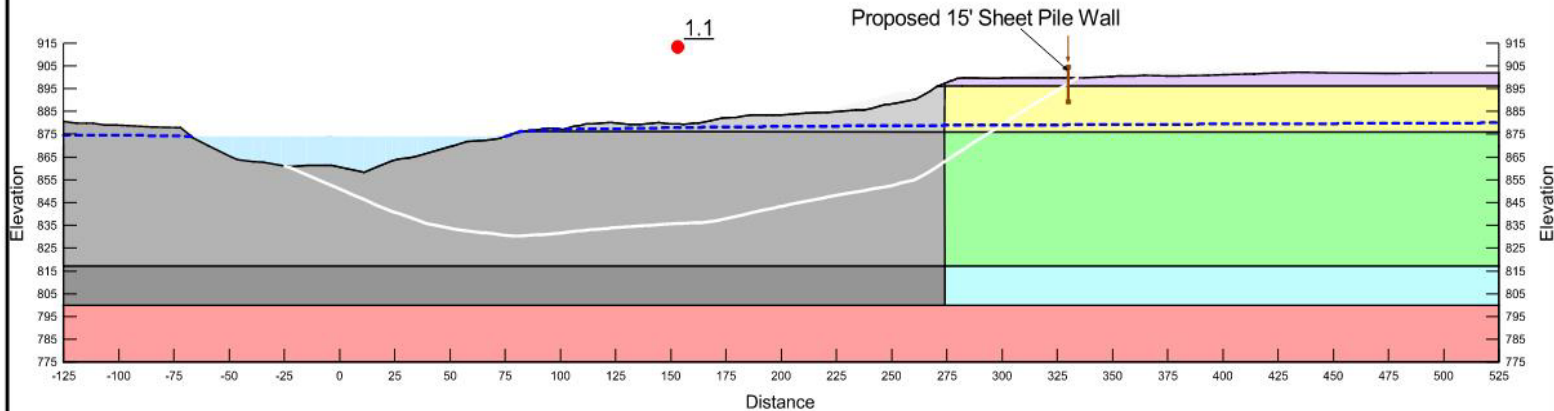
THE CITY OF
Fargo
FAR MORE

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

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RECOMMENDED PROJECT ALIGNMENT





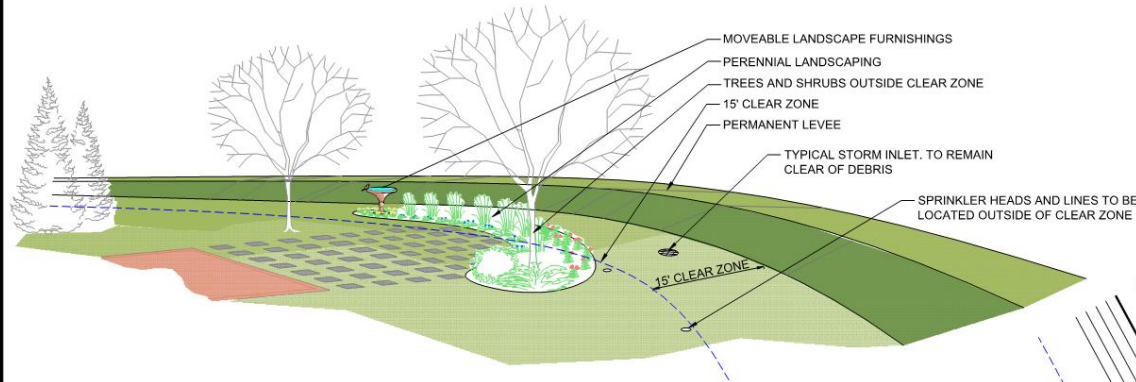
Levee Examples

STANDARD LEVEE EXAMPLE



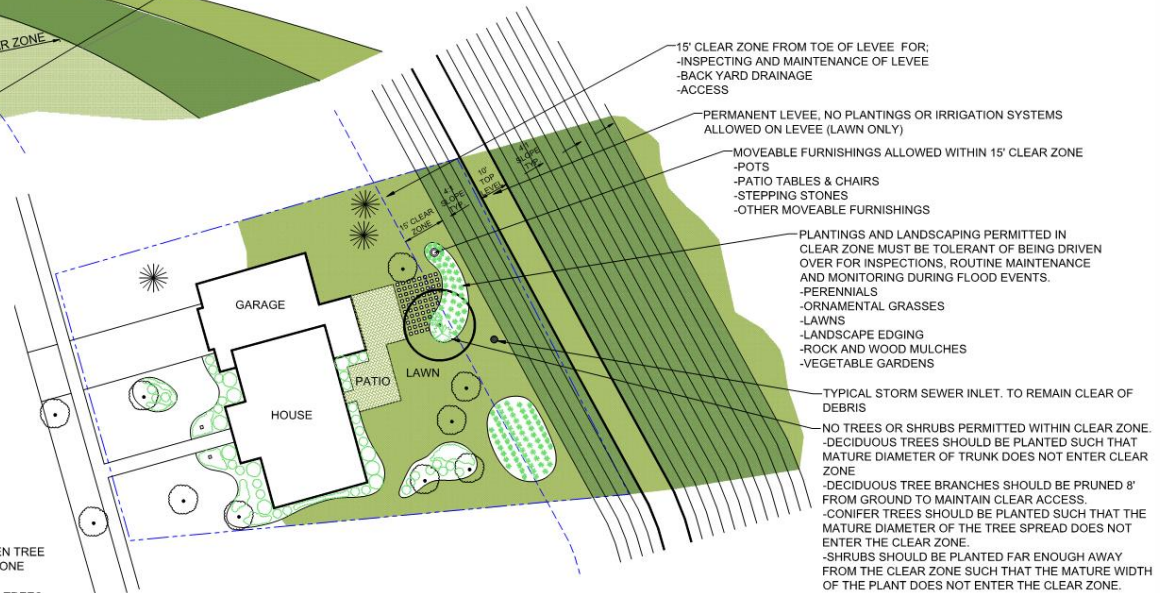
STANDARD LEVEE ALLOWABLE USE

CITY OF FARGO STANDARD LEVEE ALLOWABLE USE EXAMPLE

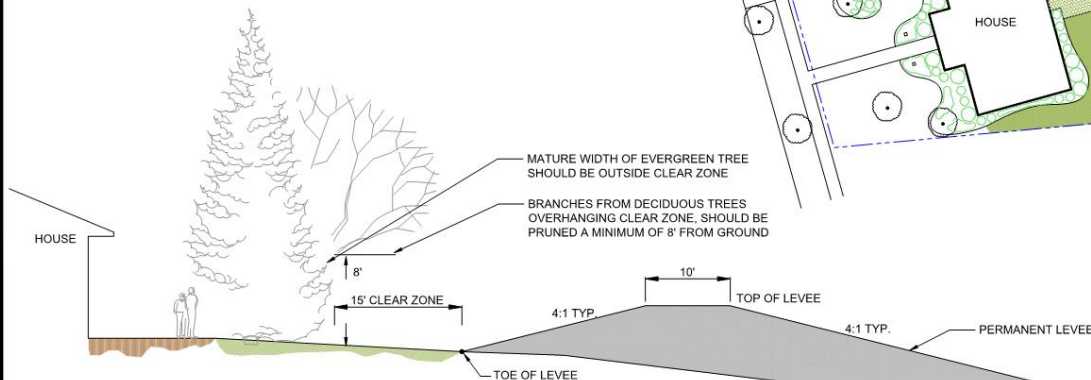


Typical Perspective

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



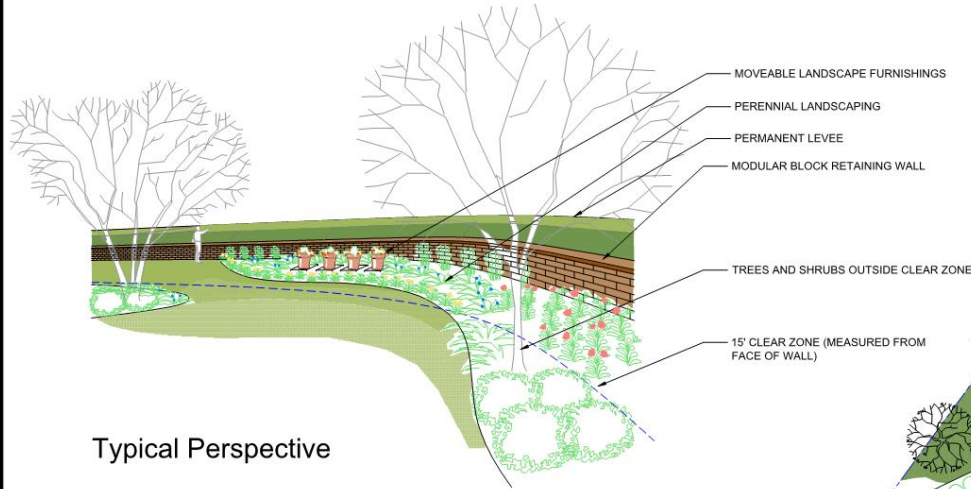
MODULAR BLOCK WALL LEVEE EXAMPLE



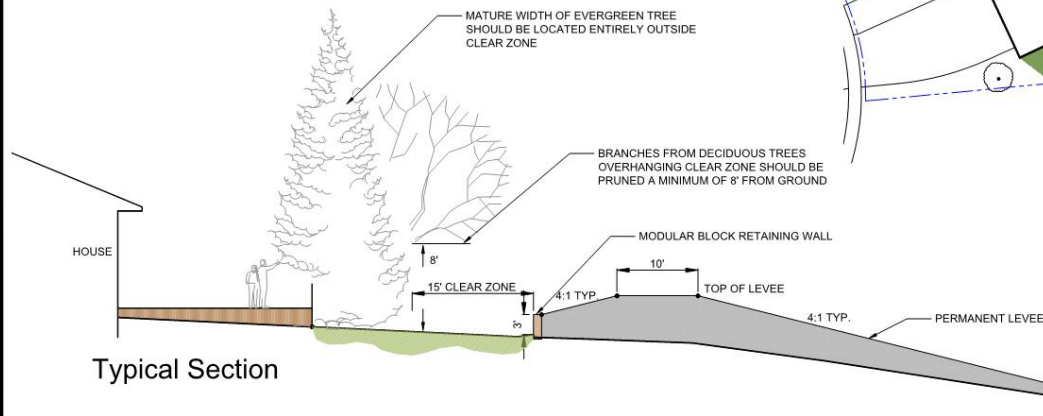
Maintenance Process

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

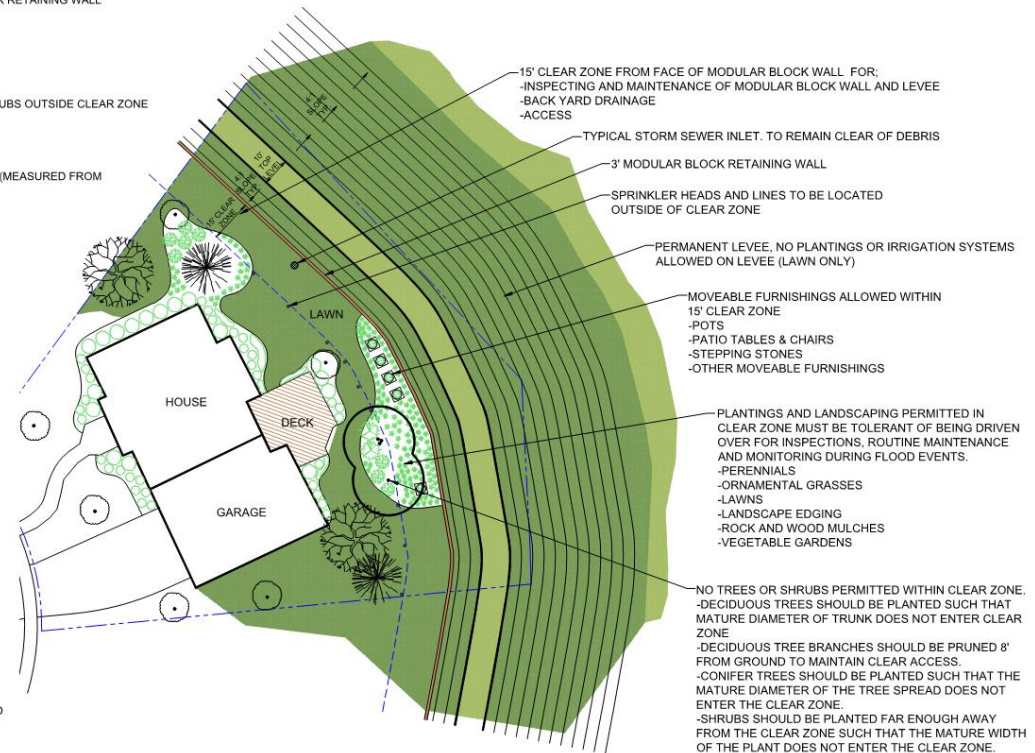
MODULAR BLOCK WALL LEVEE ALLOWABLE USE



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.



CITY OF FARGO STANDARD COMBINATION LEVEE WITH MODULAR BLOCK WALL ALLOWABLE USE EXAMPLE



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



An aerial photograph of a residential neighborhood in winter. The ground is covered in a thick layer of snow. Several houses with snow-laden roofs are visible, interspersed with bare trees and some evergreens. A road or path winds through the center of the neighborhood. A semi-transparent blue banner is overlaid across the middle of the image, containing the title text.

Path Forward

PROJECT TIMELINE

- Public Informational Meeting (9/19/19)
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- October – Soil Borings
- Revised Preliminary Project Design
- 2ND 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)

Comment Form



Elm Circle Area Flood Risk Management Project

January 21, 2020 Informational Meeting

Landowner Project Opinion:

☐ Yes ☐ No - I support the recommended plan for providing improved flood risk management for the Elm Circle Area.

Additional Comments:

Please Return by September 30, 2019 to:

Randy Engelstad
Houston Engineering, Inc.
1401 21st Avenue North
Fargo, ND 58102
Phone: (701) 499-2087
Fax: (701) 237-5101
Rengelstad@Houstoneng.com

Name: _____

Address: _____

Date: _____



PROJECT TIMELINE

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An aerial photograph of a residential neighborhood in winter. The ground is covered in a thick layer of snow. Several houses with snow-laden roofs are visible, along with bare trees and some evergreens. A road winds through the scene, and a few vehicles can be seen. A large, semi-transparent blue banner is overlaid across the middle of the image.

Questions



MODULAR BLOCK WALL LEVEE MAINTENANCE



MODULAR BLOCK WALL LEVEE EXAMPLE





MODULAR BLOCK WALL LEVEE EXAMPLE





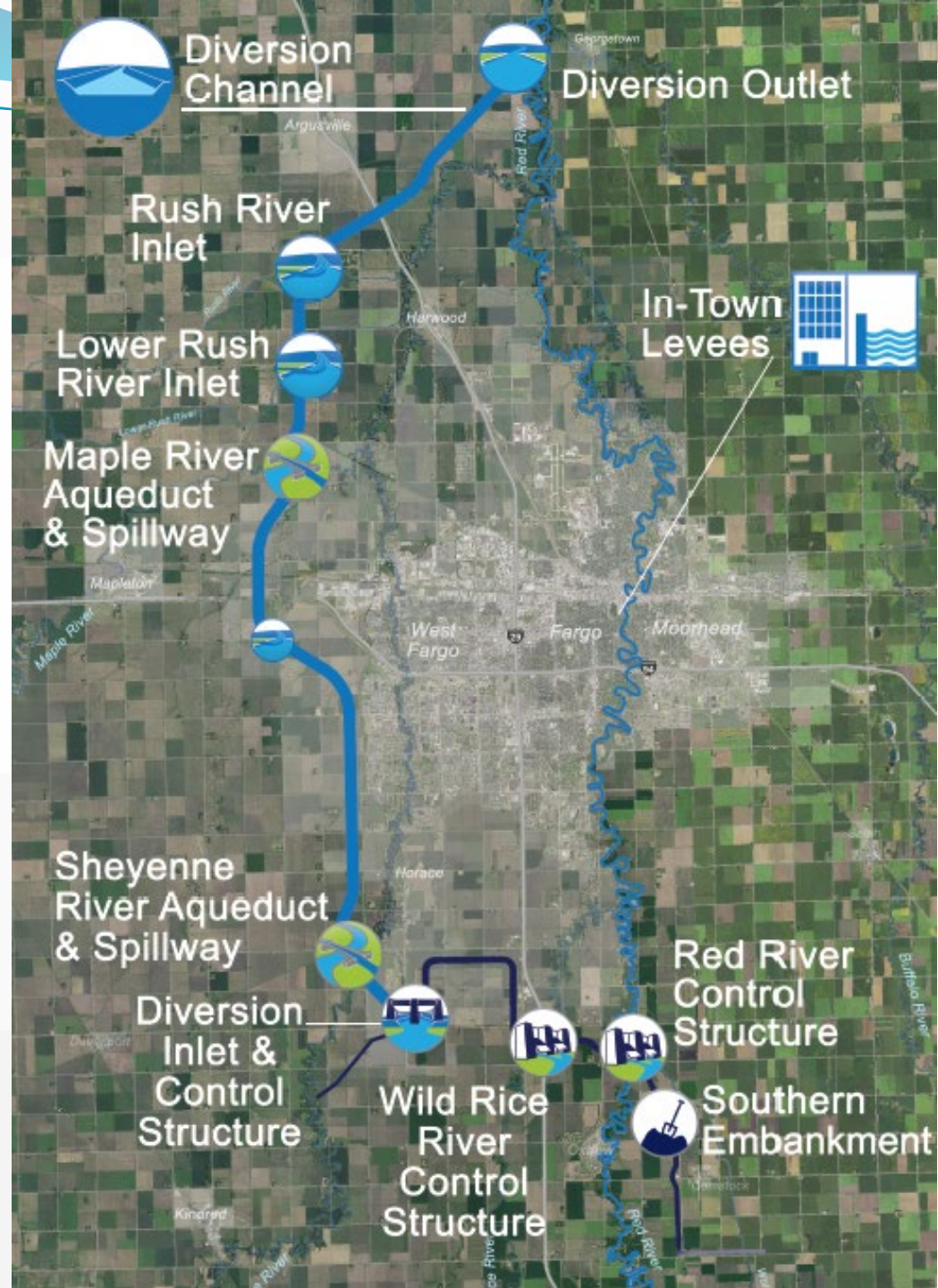
An aerial photograph of a residential neighborhood in winter. The ground is covered in a thick layer of snow. Several houses are visible, including a large orange house with a dark roof in the center, a smaller green house in the foreground, and a multi-story orange and white house in the upper left. Bare trees and evergreens are scattered throughout the landscape. A river or large body of water is visible on the right side of the image. A blue semi-transparent banner is overlaid across the middle of the image.

FM Diversion

Diversion Project

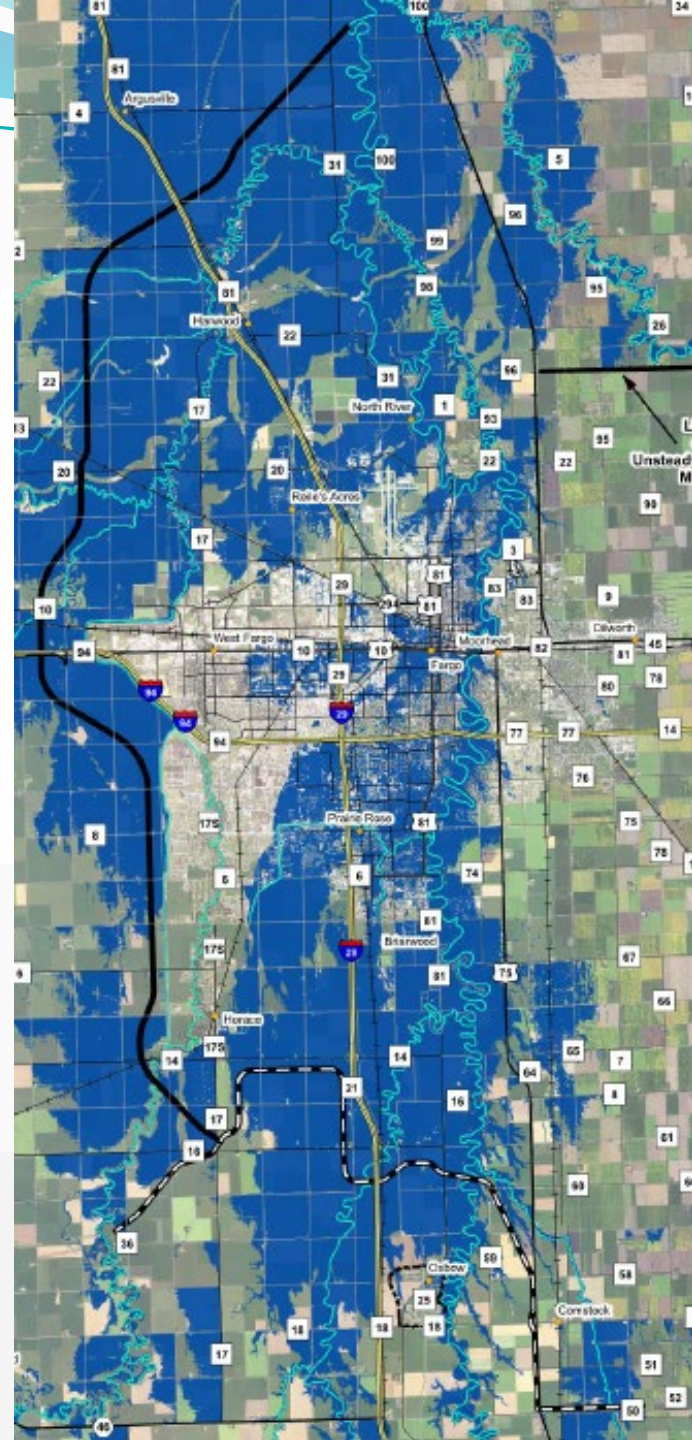
“Plan B”

- 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.



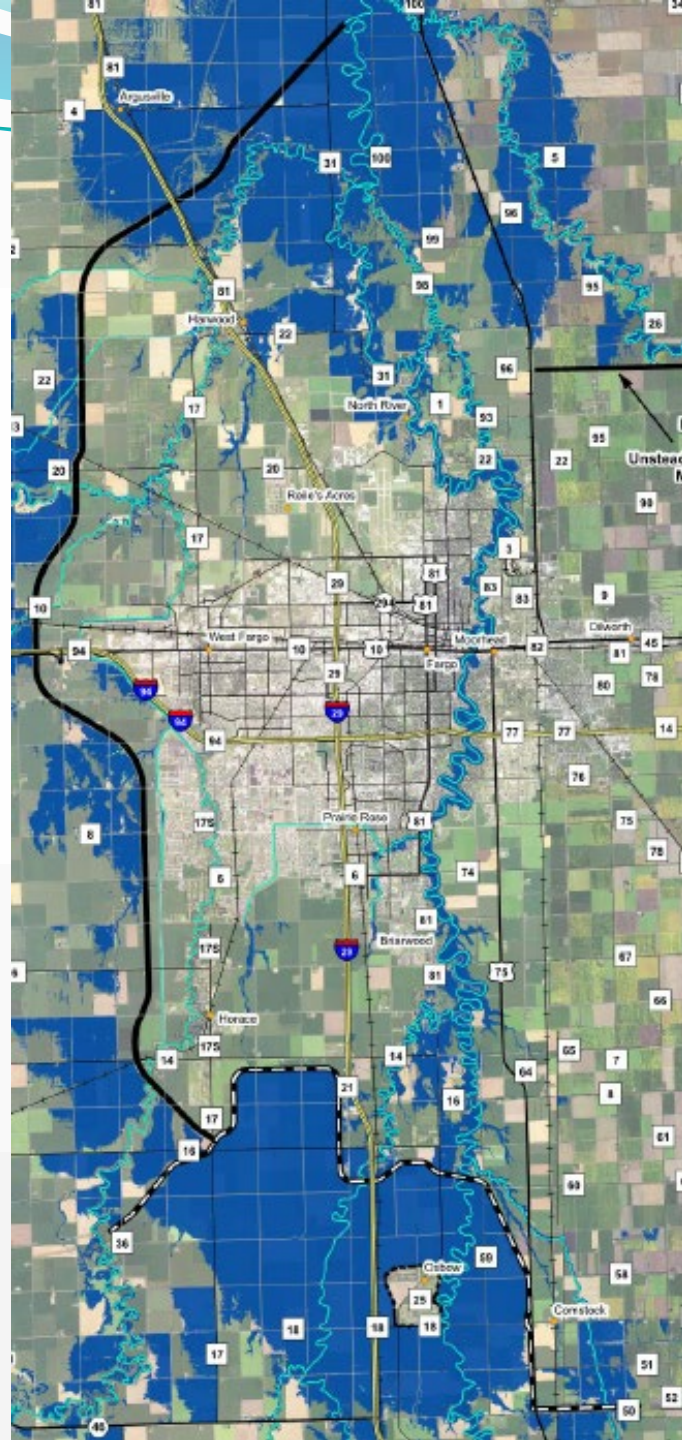
Existing Conditions

- 100-year floodplain shown in blue



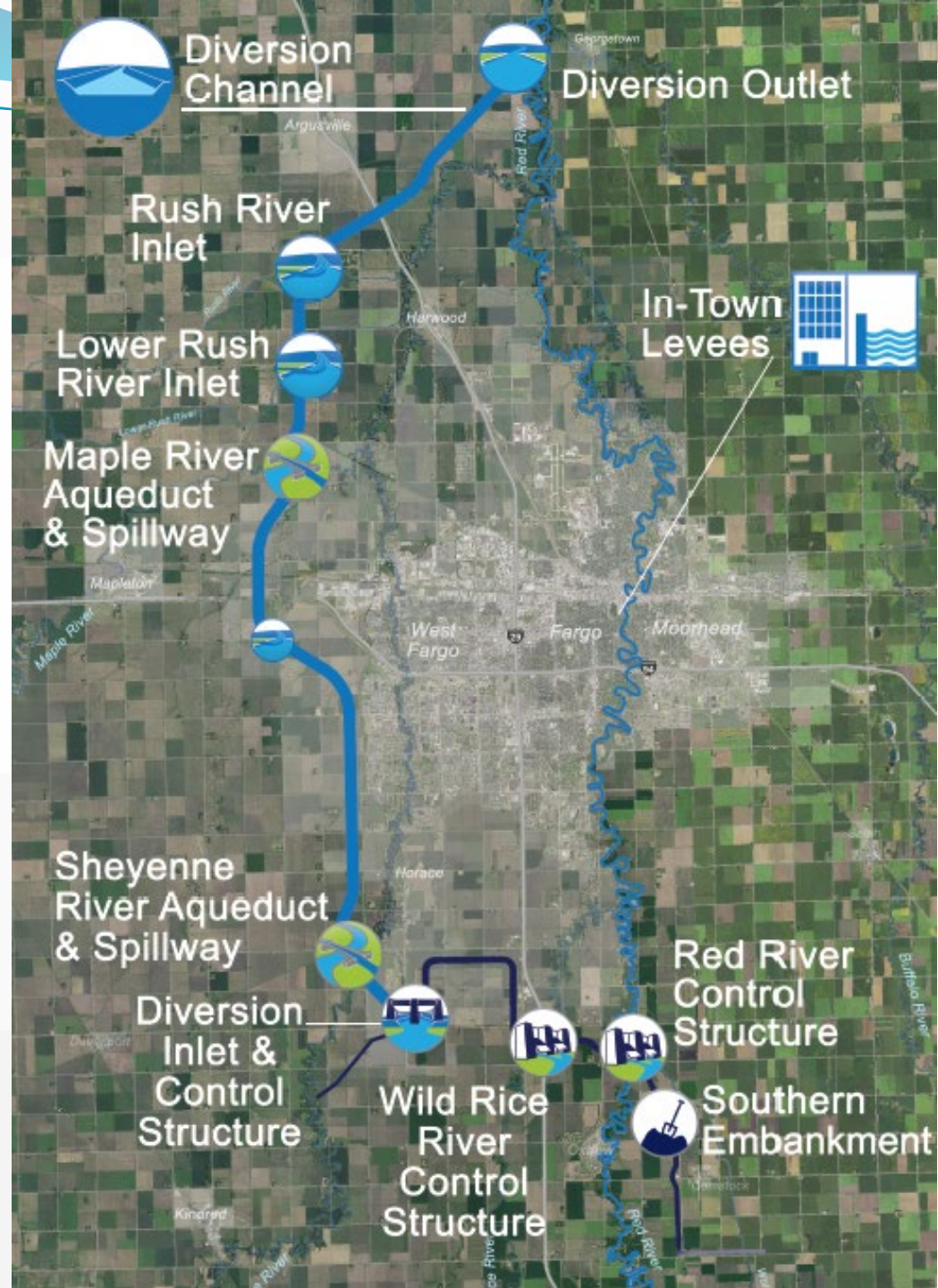
With Project

- 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
- Temporary Staging of Flood Waters Upstream to Prevent Downstream Impacts
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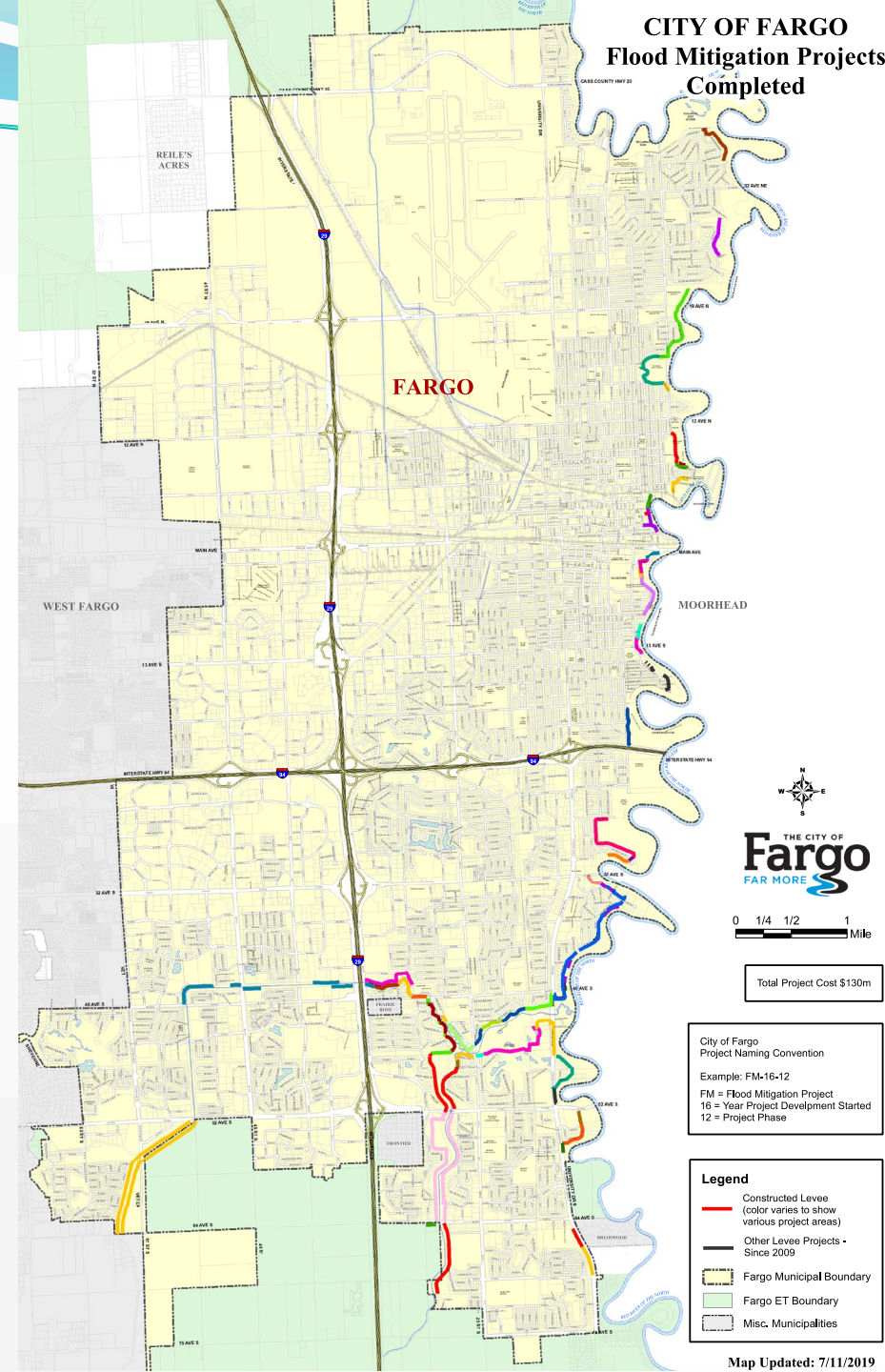


An aerial photograph of a residential neighborhood in winter. The ground is covered in a thick layer of snow. Several houses of various colors (red, white, brown) are visible, some with snow on their roofs. Bare trees are scattered throughout the landscape, and a river or stream flows through the lower portion of the image. A blue banner with white text is overlaid in the center.

In-Town Projects

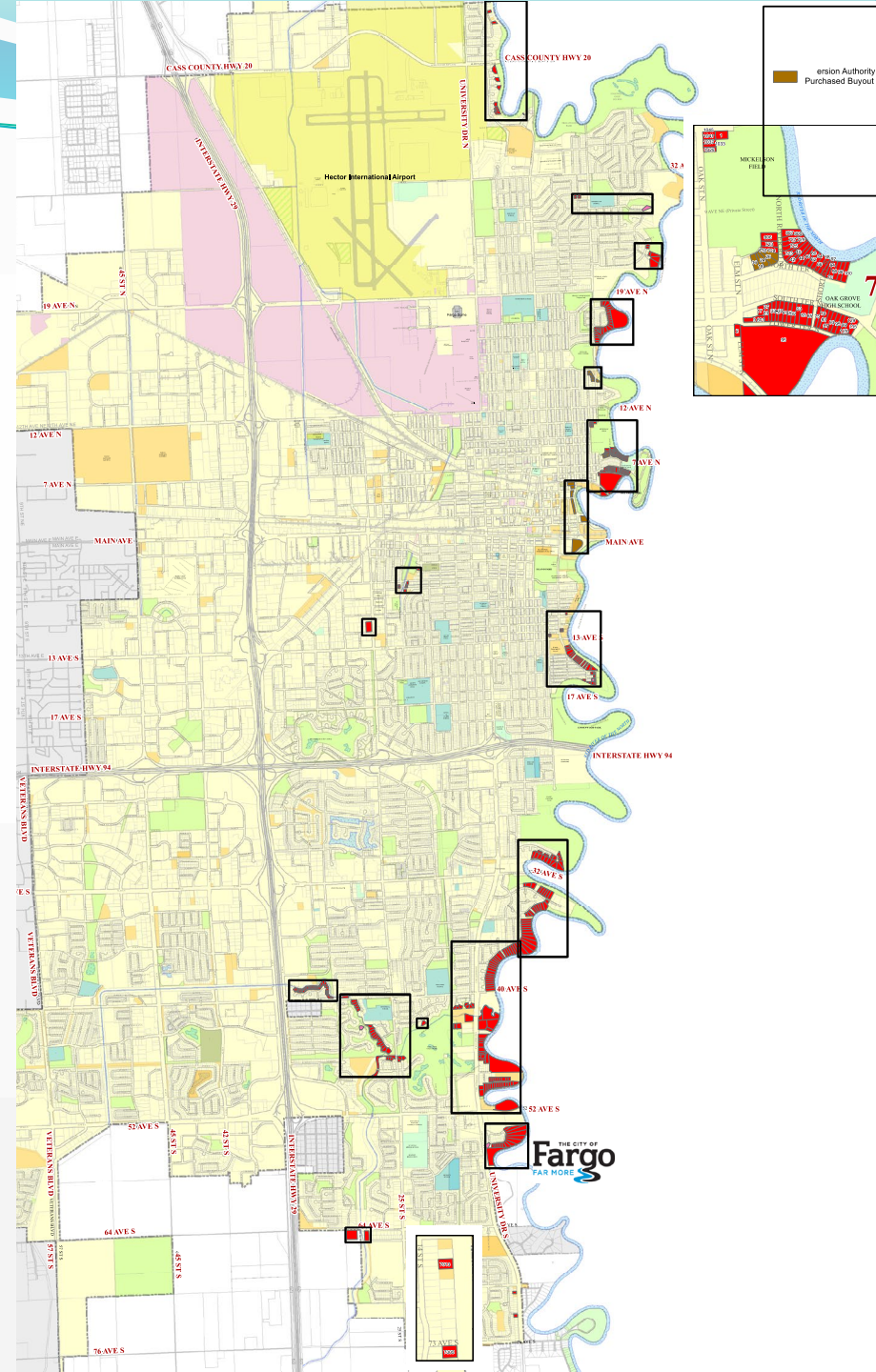
PROJECTS COMPLETED SINCE 2009

- 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



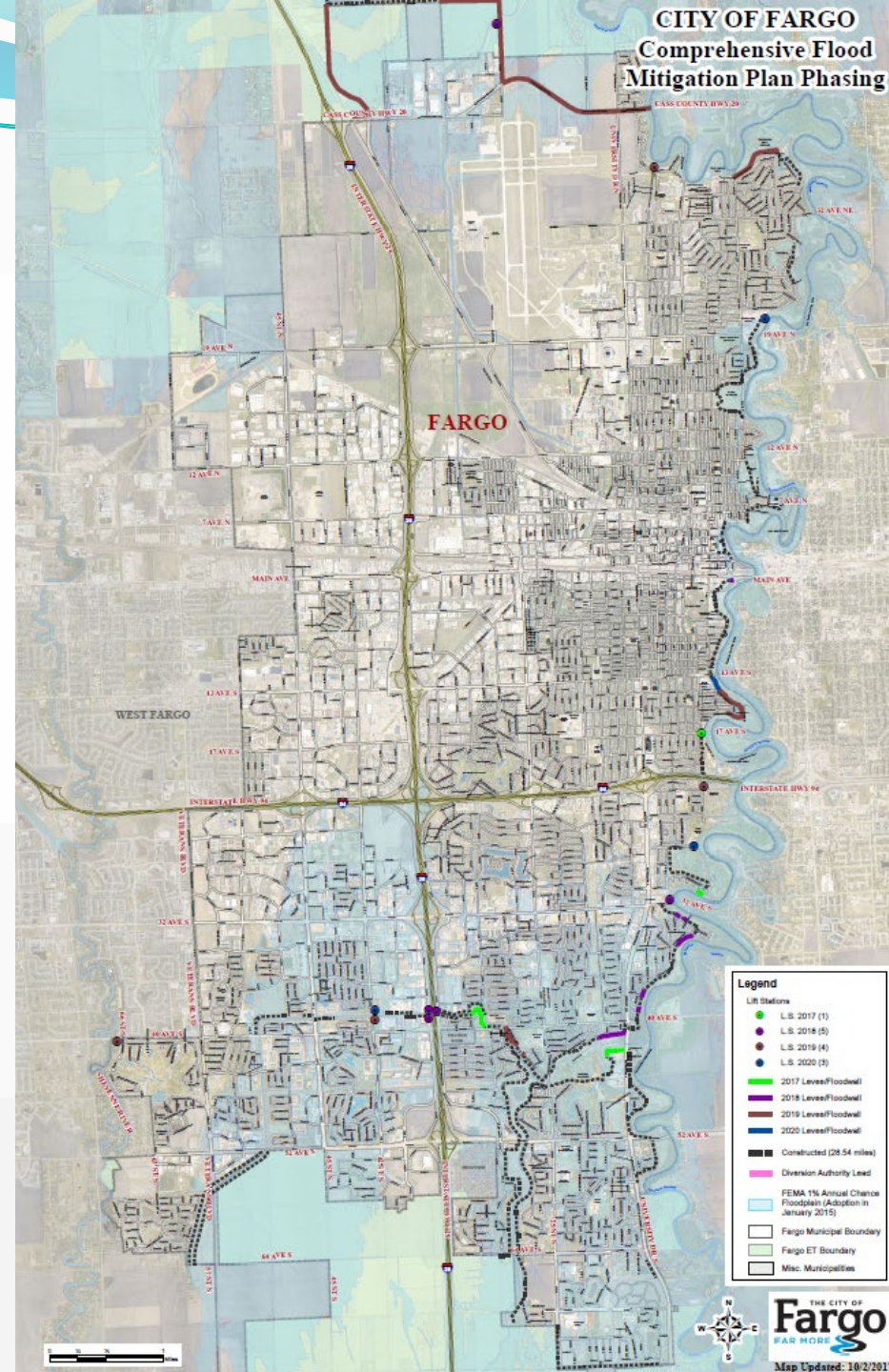
PROJECT ACQUISITIONS SINCE 2009

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



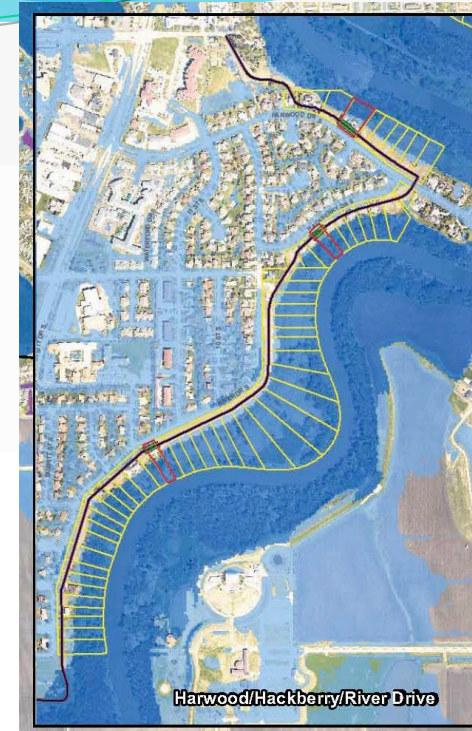
2019 PROJECTS UNDER CONSTRUCTION

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



REMAINING PROJECTS

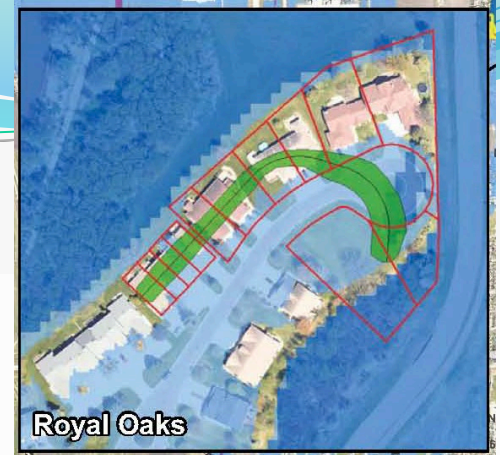
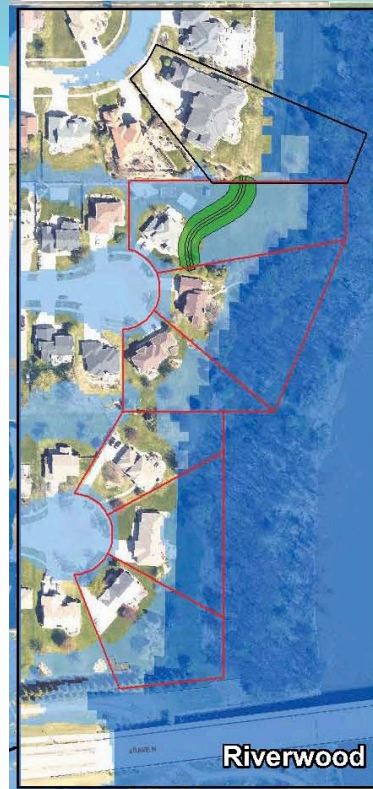
- 2016 Revised Comprehensive Plan Projects
 - Harwood, Hackberry & River Drives
 - 3 Acquisitions Remain
 - Levee Construction
 - Belmont Park
 - 3 Acquisitions Remain
 - Levee & Floodwall Construction
 - Water Intake Building Modifications
 - Drain 10/Airport Area
 - Levee Construction
 - Storm Sewer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



REMAINING PROJECTS

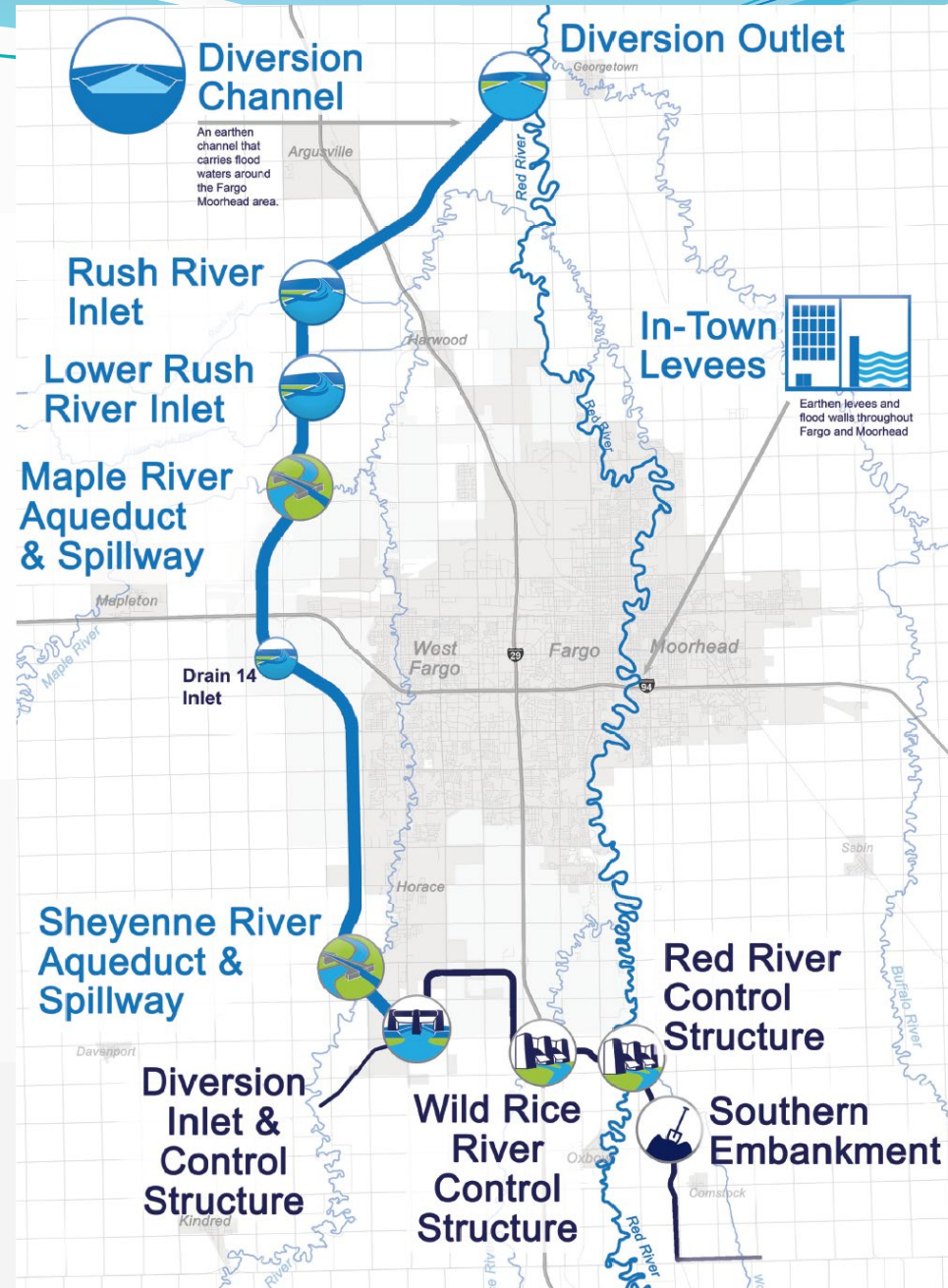
- Plan B Additional In-Town Projects

- 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

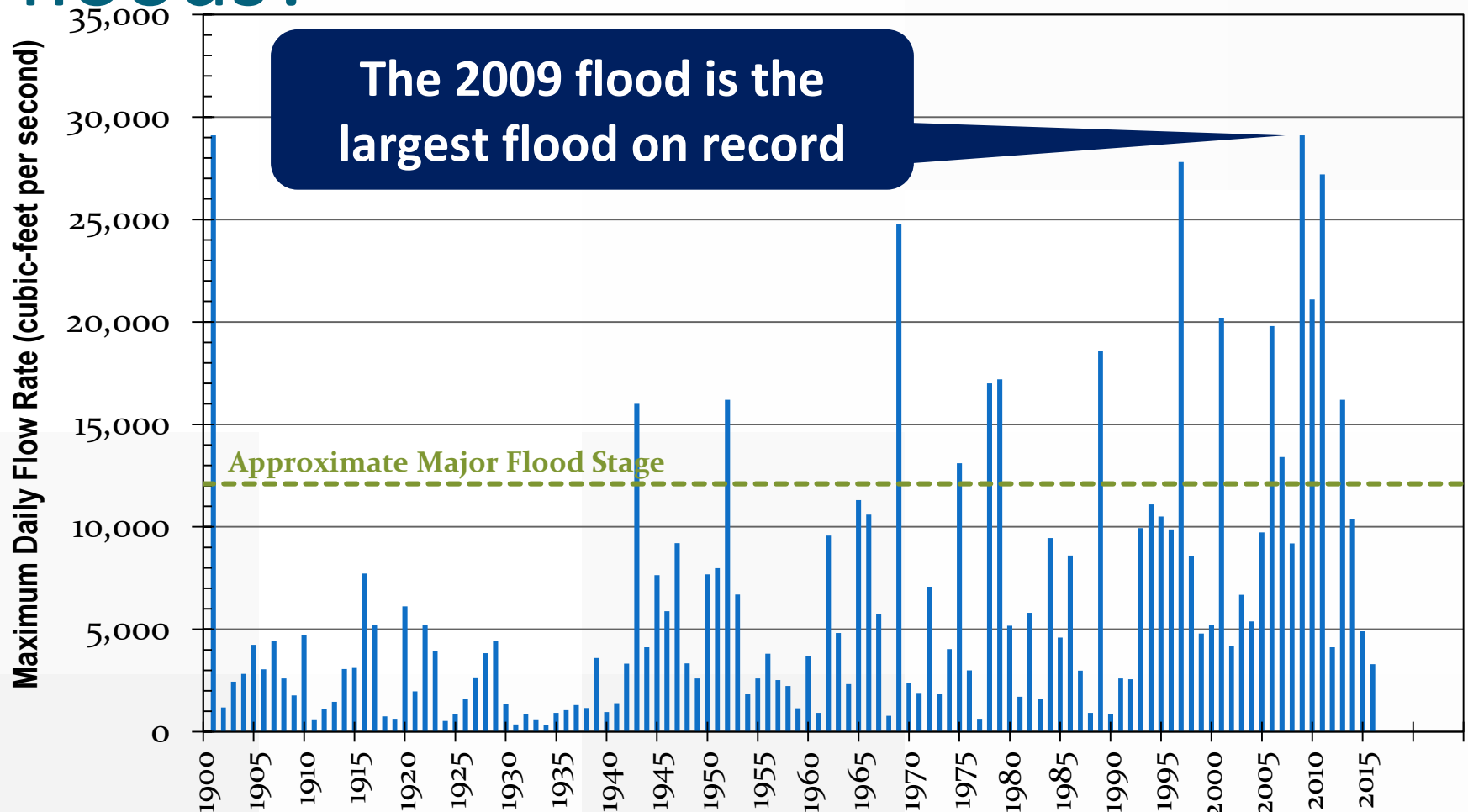


FM Diversion Project Status

- 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