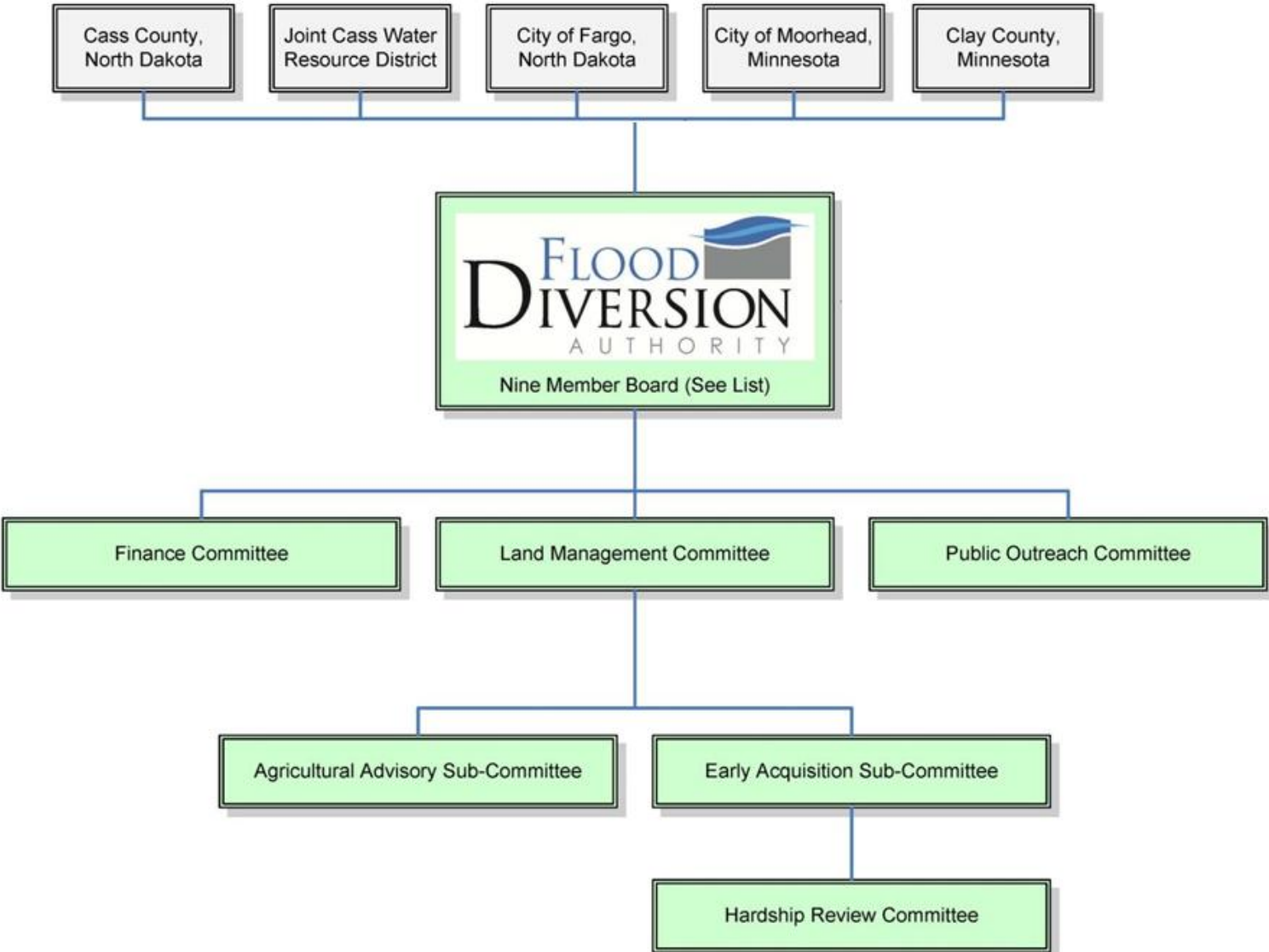


Fargo-Moorhead Area Diversion Project

Presentation to:
ND Water Education Foundation

By:
Nathan Boerboom, City of Fargo
Randy Richardson, CH2M
Rocky Schneider, AE2S
Gregg Thielman, Houston Engineering
Terry Williams, USACE

Who is the Diversion Authority?



FLOOD DIVERSION AUTHORITY

USACE



Program Management Consultant



Design Consultants



Presentation Outline

- 💧 Flood History & Project Need
- 💧 Changing Floodplains & Flood Insurance
- 💧 Federally Project
- 💧 Hydraulic Analysis
- 💧 Post Feasibility Revisions
- 💧 Project Design & Features
- 💧 Project Operations
- 💧 Mitigation Efforts
- 💧 Public-Private Partnership
- 💧 Financial Plan



Breaking News: The FM Area Diversion Project

- 💧 On July 8, the North Dakota State Water Commission issued permit to begin construction
- 💧 On July 11, a Project Partnership Agreement (PPA) was signed between the U.S. Army Corps of Engineers and the local sponsors – Fargo, Moorhead, and the Diversion Authority
 - *The PPA:*
 - Secures \$450M in federal funding
 - Enables the Corps to begin construction
 - Outlines the responsibilities of local sponsors and the federal government



Flood History & Project Need

Red River Basin

Total Drainage Area:
45,000 square miles

**Drainage Area Upstream of
Fargo/Moorhead:**
6,800 square miles

**North
Dakota**

Baldhill Dam

Maple River Dam

Orwell Dam

White Rock Dam

Q₁₀₀ year = 34,700 cfs

Q₅₀₀ year = 61,700 cfs

Q_{max} 2009 = 29,500 cfs

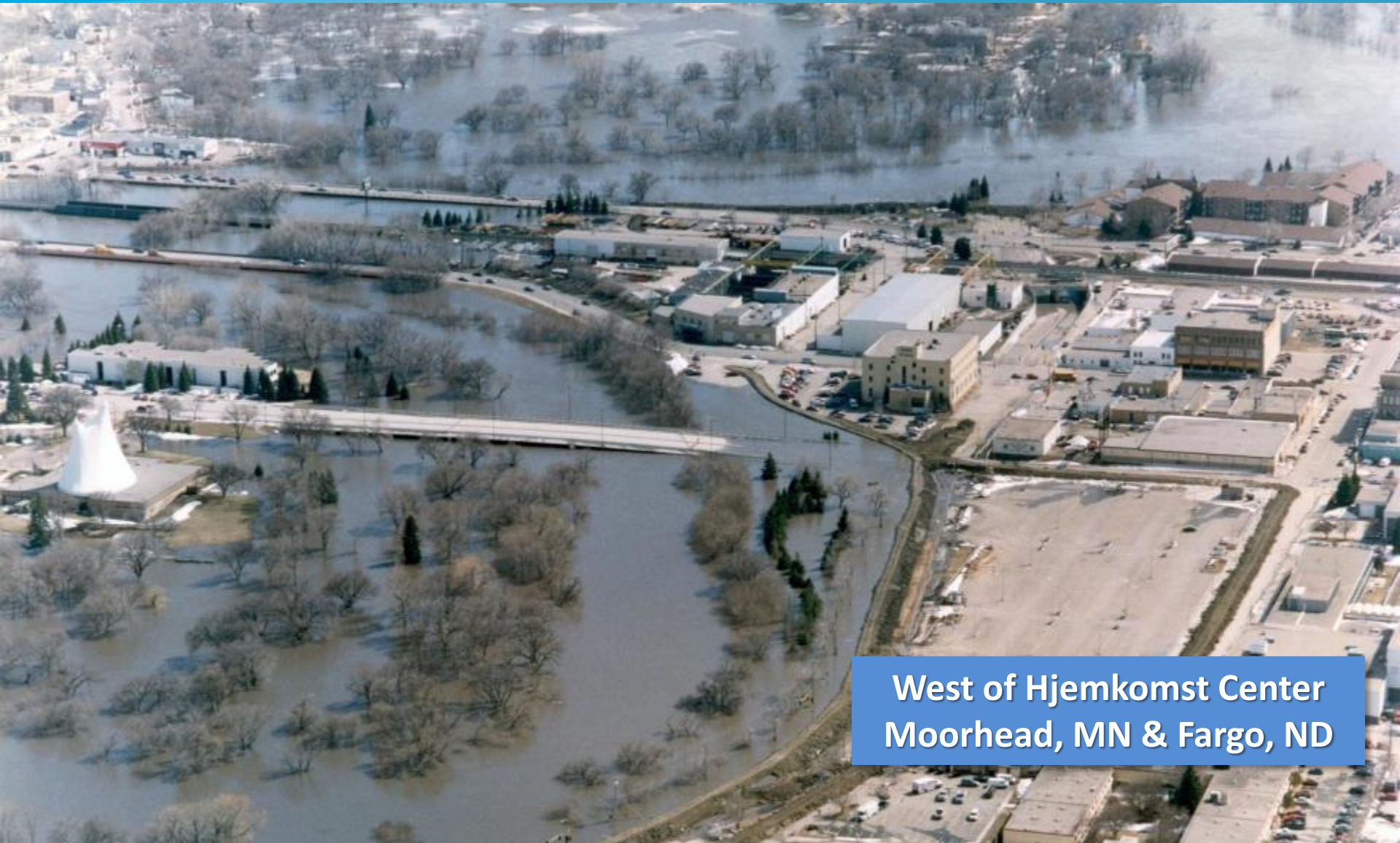
Image USDA Farm Service Agency

© 2011 Europa Technologies

© 2011 Google

Minneapolis

Water Everywhere



West of Hjemkomst Center
Moorhead, MN & Fargo, ND

Transportation Challenges



Interstate 29

Closed April 10. Reopened April 15, 2011.

Detour added = 22.8 miles

Red River Flooding History

💧 **Red River Flood Stage = 18 feet on the Fargo gage at 13th Ave. S.**

Exceeded in 50 of the past 111 years

Exceeded 20 of the last 21 years

💧 **Catastrophic damages have been prevented by emergency measures**

8 of the 16 “major” floods on record have occurred since 2000

💧 **2009 was the flood of record**

Stage of 40.8 feet

2-percent chance (50 year) event

Emergency measures cost approximately \$70M

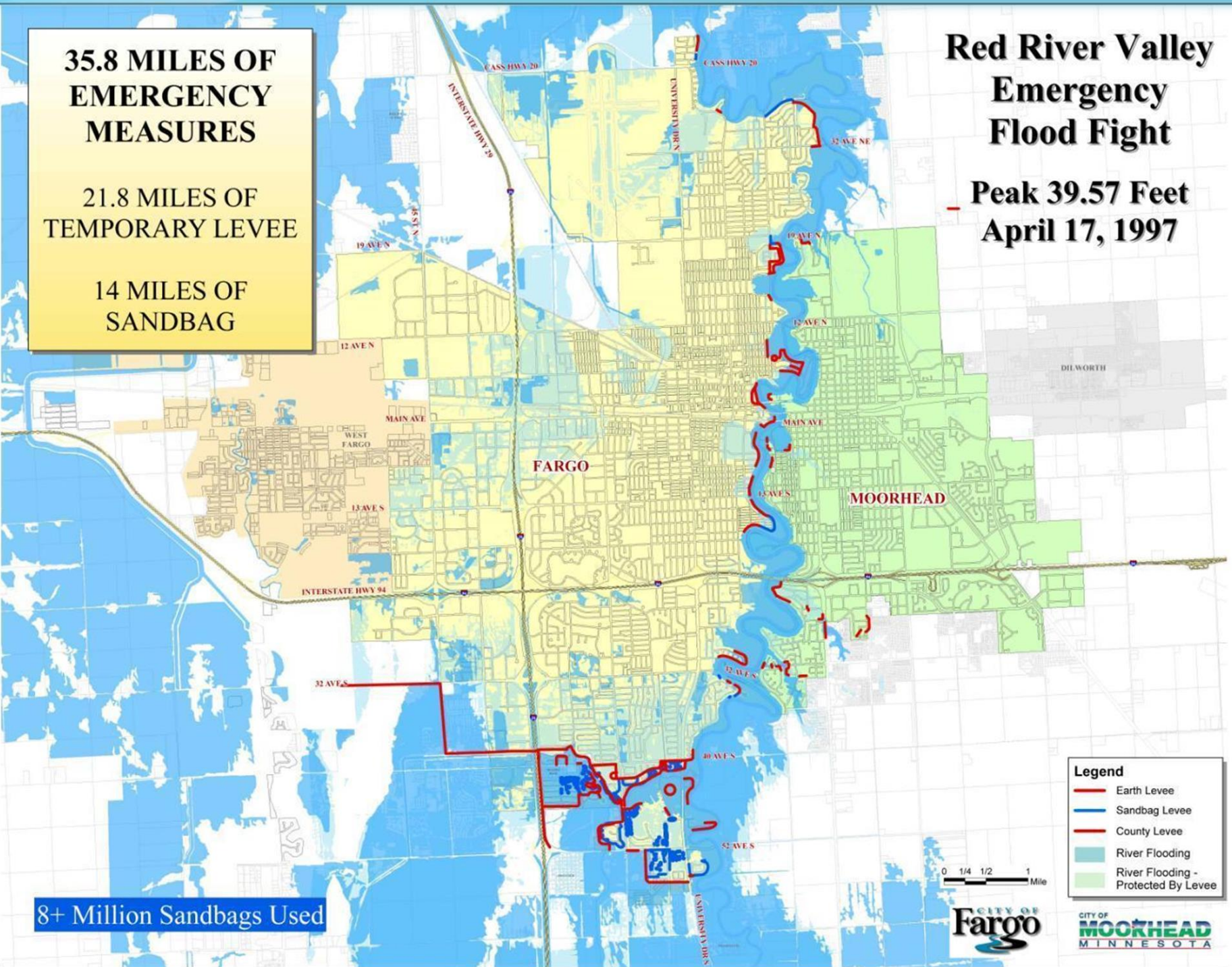
Red River Valley Emergency Flood Fight

**Peak 39.57 Feet
April 17, 1997**

**35.8 MILES OF
EMERGENCY
MEASURES**

**21.8 MILES OF
TEMPORARY LEVEE**

**14 MILES OF
SANDBAG**



Legend

- Earth Levee
- Sandbag Levee
- County Levee
- River Flooding
- River Flooding - Protected By Levee

8+ Million Sandbags Used

0 1/4 1/2 1
Mile



69 MILES OF EMERGENCY MEASURES

42 MILES OF TEMPORARY LEVEE

8 MILES OF HESCO

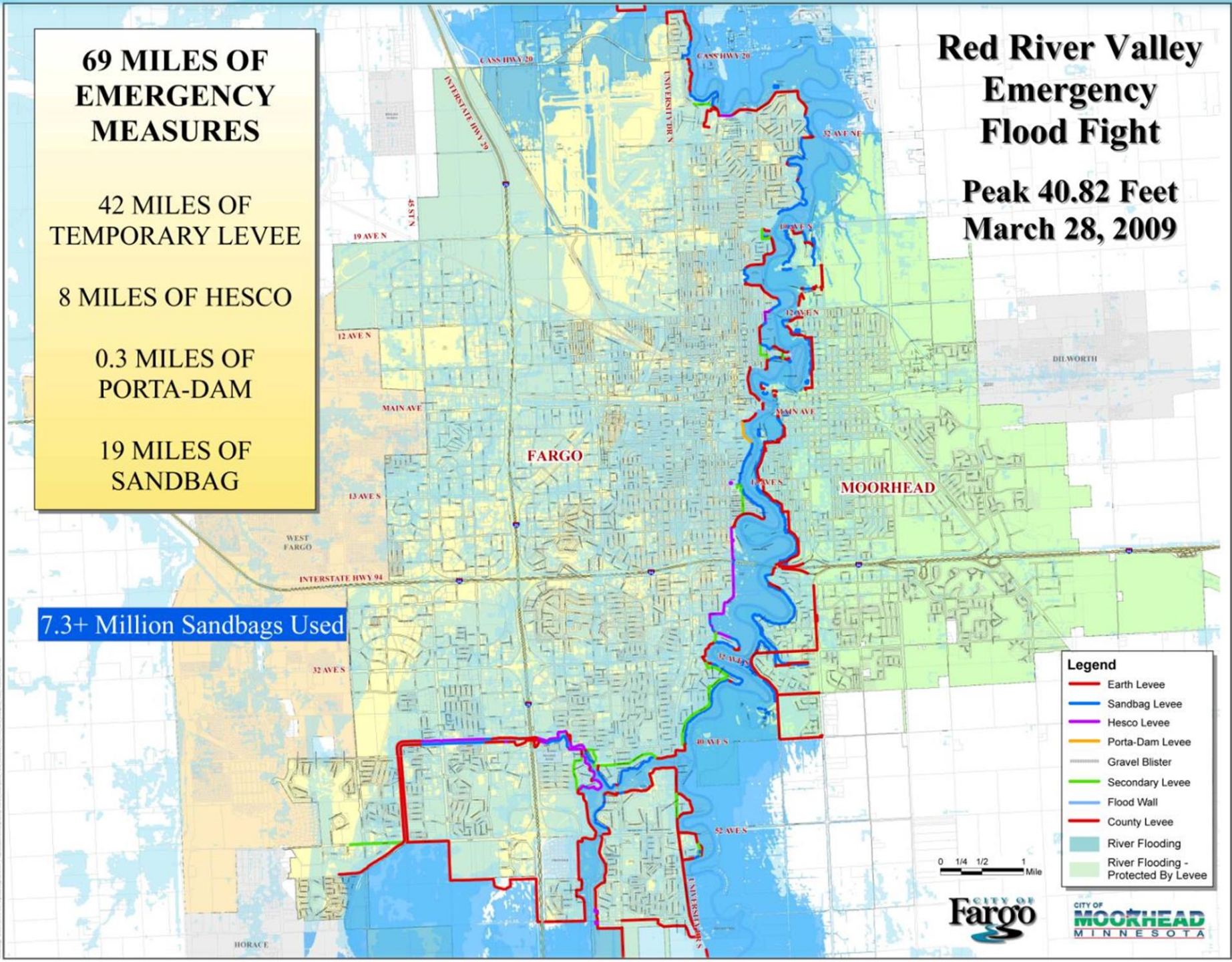
0.3 MILES OF PORTA-DAM

19 MILES OF SANDBAG

7.3+ Million Sandbags Used

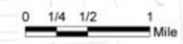
Red River Valley Emergency Flood Fight

Peak 40.82 Feet
March 28, 2009



Legend

- Earth Levee
- Sandbag Levee
- Hesco Levee
- Porta-Dam Levee
- Gravel Blister
- Secondary Levee
- Flood Wall
- County Levee
- River Flooding
- River Flooding - Protected By Levee



Red River Valley Emergency Flood Fight

Peak 36.99 Feet
March 21, 2010

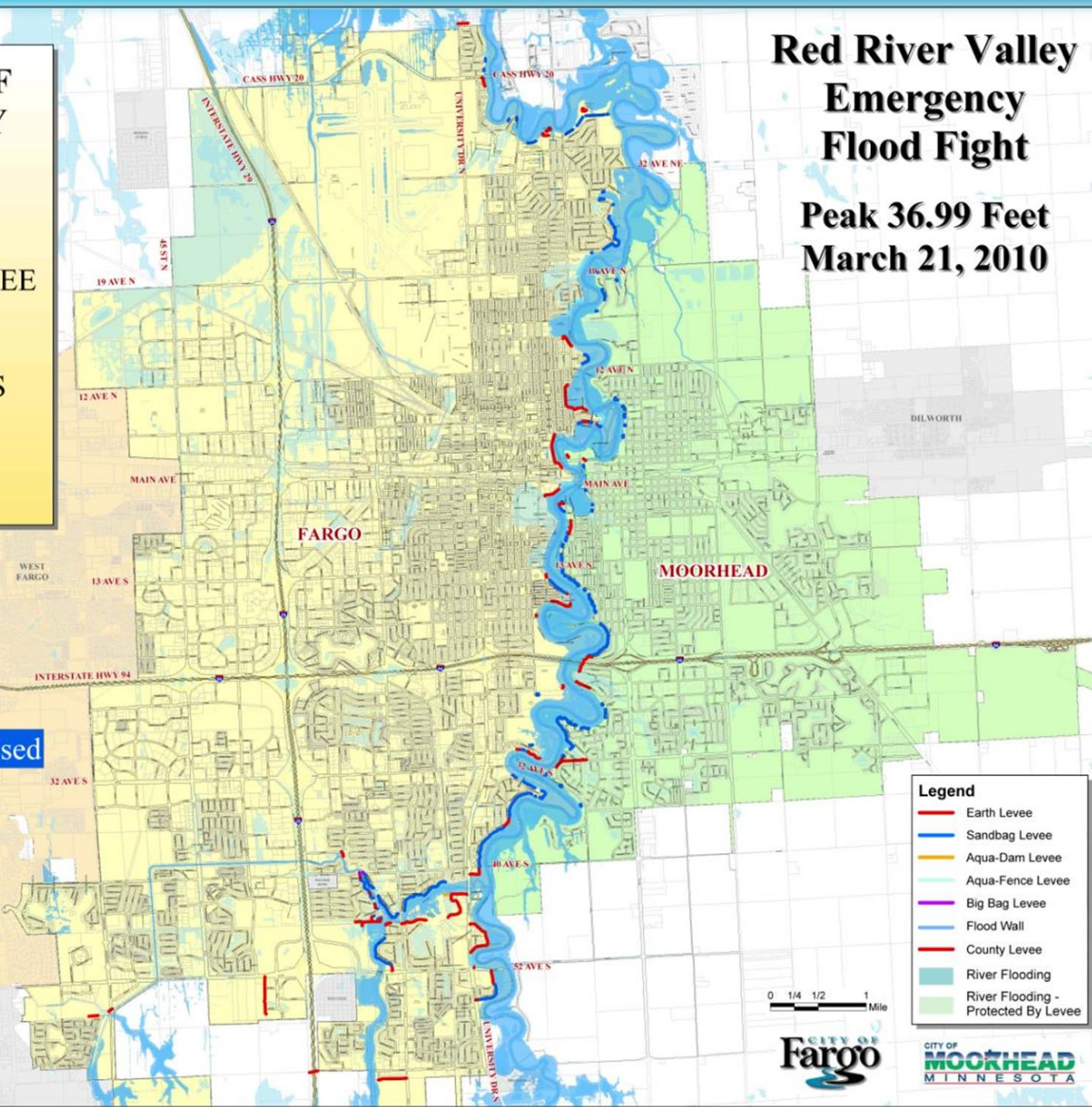
**15.2 MILES OF
EMERGENCY
MEASURES**

7.1 MILES OF
TEMPORARY LEVEE

.1 MILES OF
ALT. PRODUCTS

8 MILES OF
SANDBAG

2+ Million Sandbags Used



- Legend**
- Earth Levee
 - Sandbag Levee
 - Aqua-Dam Levee
 - Aqua-Fence Levee
 - Big Bag Levee
 - Flood Wall
 - County Levee
 - River Flooding
 - River Flooding - Protected By Levee

0 1/4 1/2 1 Mile

CITY OF
Fargo

CITY OF
MOORHEAD
MINNESOTA

**28.87 MILES OF
EMERGENCY
MEASURES**

19.07 MILES OF
TEMPORARY LEVEE

5.46 MILES OF
SANDBAG

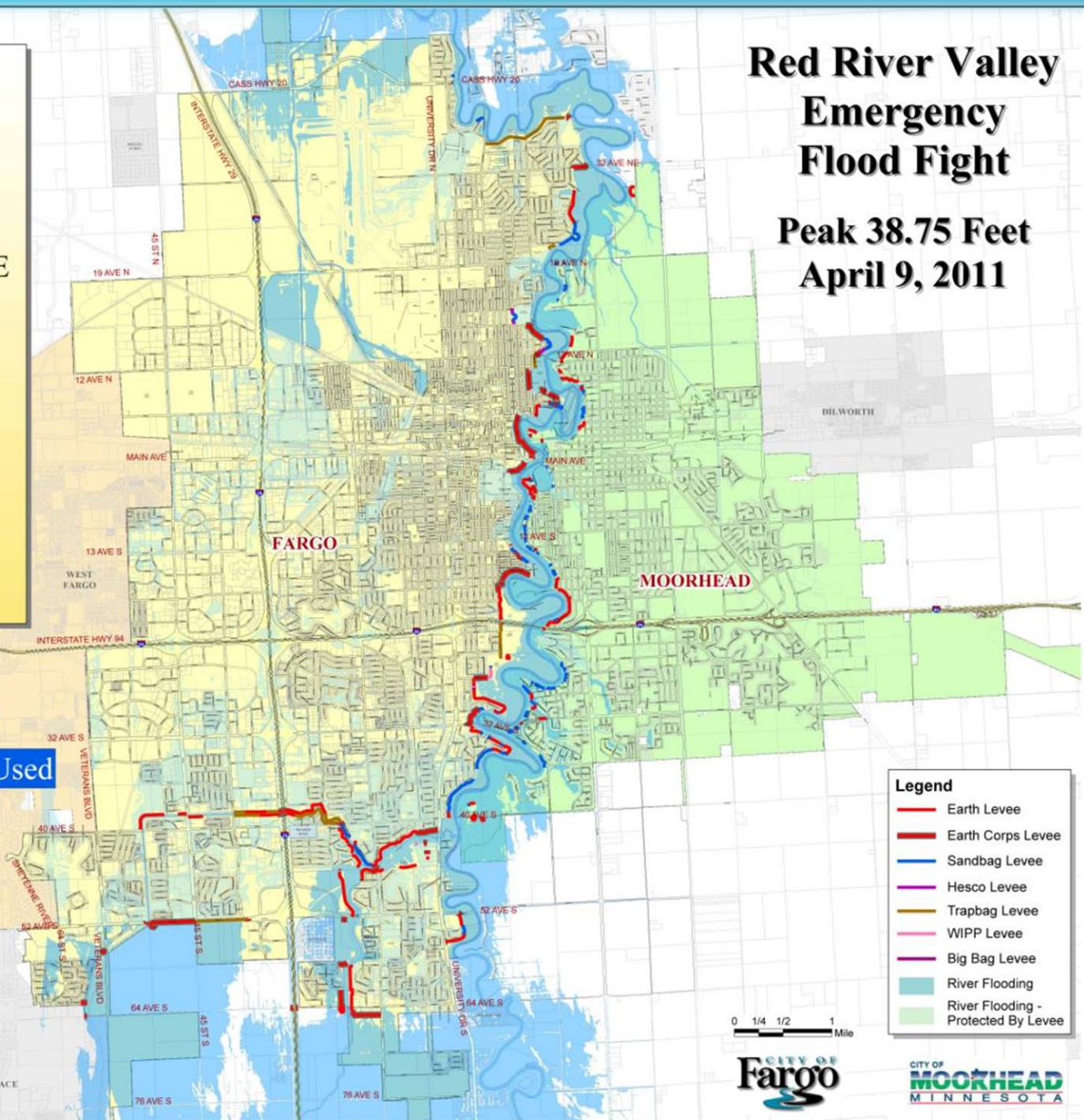
3.61 MILES OF
TRAPBAG

0.73 MILES OF
ALT. PRODUCTS

**Red River Valley
Emergency
Flood Fight**

**Peak 38.75 Feet
April 9, 2011**

1.9+ Million Sandbags Used



- Legend**
- Earth Levee
 - Earth Corps Levee
 - Sandbag Levee
 - Hesco Levee
 - Trapbag Levee
 - WIPP Levee
 - Big Bag Levee
 - River Flooding
 - River Flooding - Protected By Levee

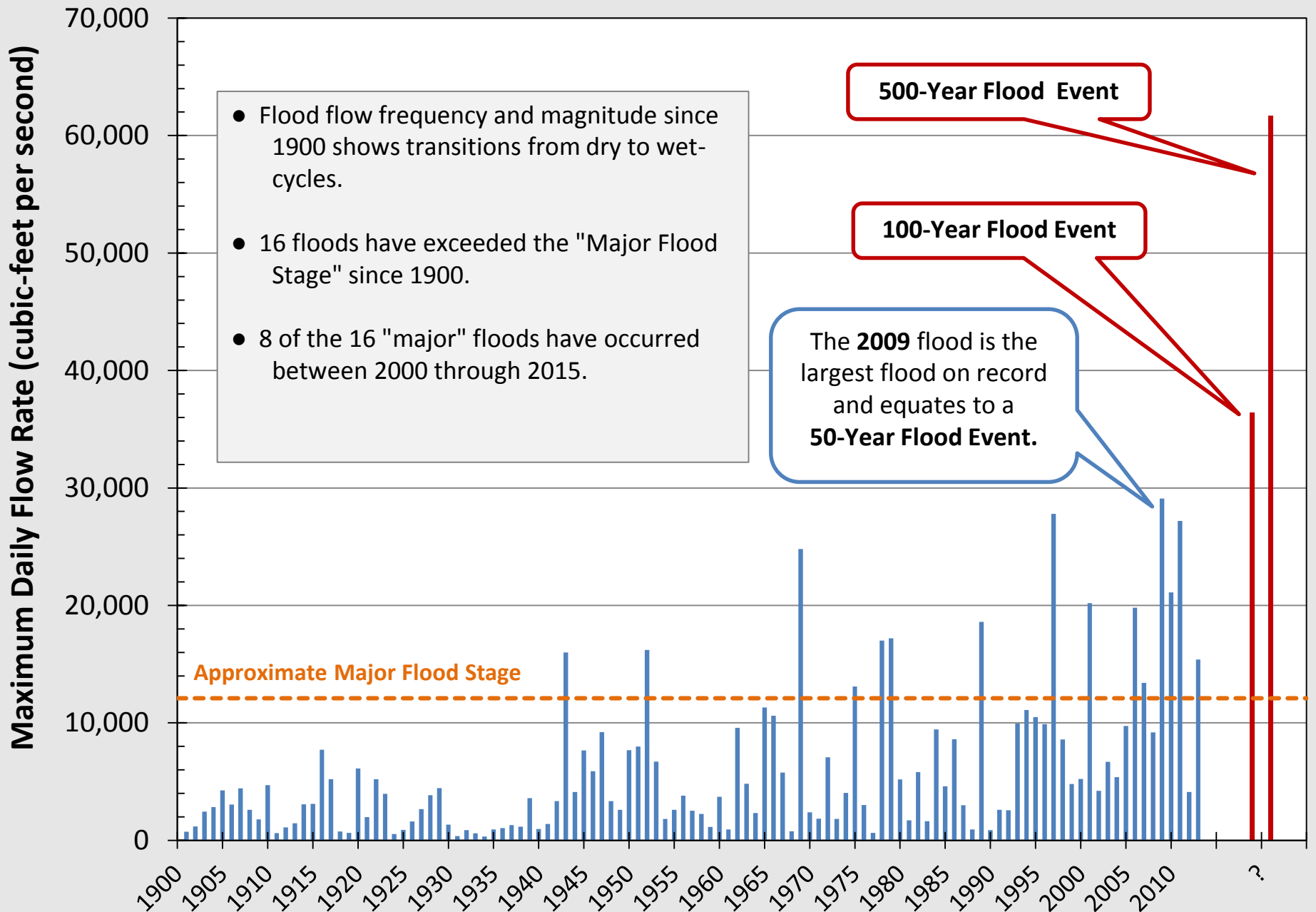
0 1/4 1/2 1 Mile





Changing Floodplains & Flood Insurance

Red River of the North at Fargo, North Dakota



Greater than 100-Year Protection is Needed

- 💧 Red River Basin Commission recommends 500-year protection for large metro areas like Fargo-Moorhead
- 💧 Only Winnipeg meets the RRBC guidelines for flood protection for cities in the Red River Basin
- 💧 Bigger floods have already been experienced in Minot and Grand Forks, North Dakota

Diversion Projects Have Proven Success

💧 Diversion Project in Winnipeg in place since 1969

- *Was recently expanded from 90-year flood protection to 700-year flood protection*
- *Has operated more than 20 times since its completion*
- *Has prevented \$32 billion in flood damages*



💧 Sheyenne Diversion continues to succeed in West Fargo, North Dakota

💧 Wahpeton/Breckenridge Diversion protected community during the 2009 flood and has paid for itself multiple times already

Fargo Floodplain Risk

- Pre-2015 FEMA Floodplain (Fargo)
 - 38.5 Feet River Gage (29,300 cfs)
 - 475 Impacted Structures
- 2015 FEMA Floodplain (Fargo)
 - 39.4 Feet River Gage (29,300 cfs)
 - Approx. 2,300 Impacted Structures
- Future USACE Floodplain (Fargo)
 - 41.1 River Gage (34,700 cfs)
 - Approx. 19,400 Impacted Structures

“If I am in a community that we come back five years down the road and they are still talking about a project, I am probably going to change the map then,” said Federal Emergency Management Agency’s (FEMA) Deputy Associate Administrator for Mitigation, Roy Wright. (4/1/15)



Moorhead

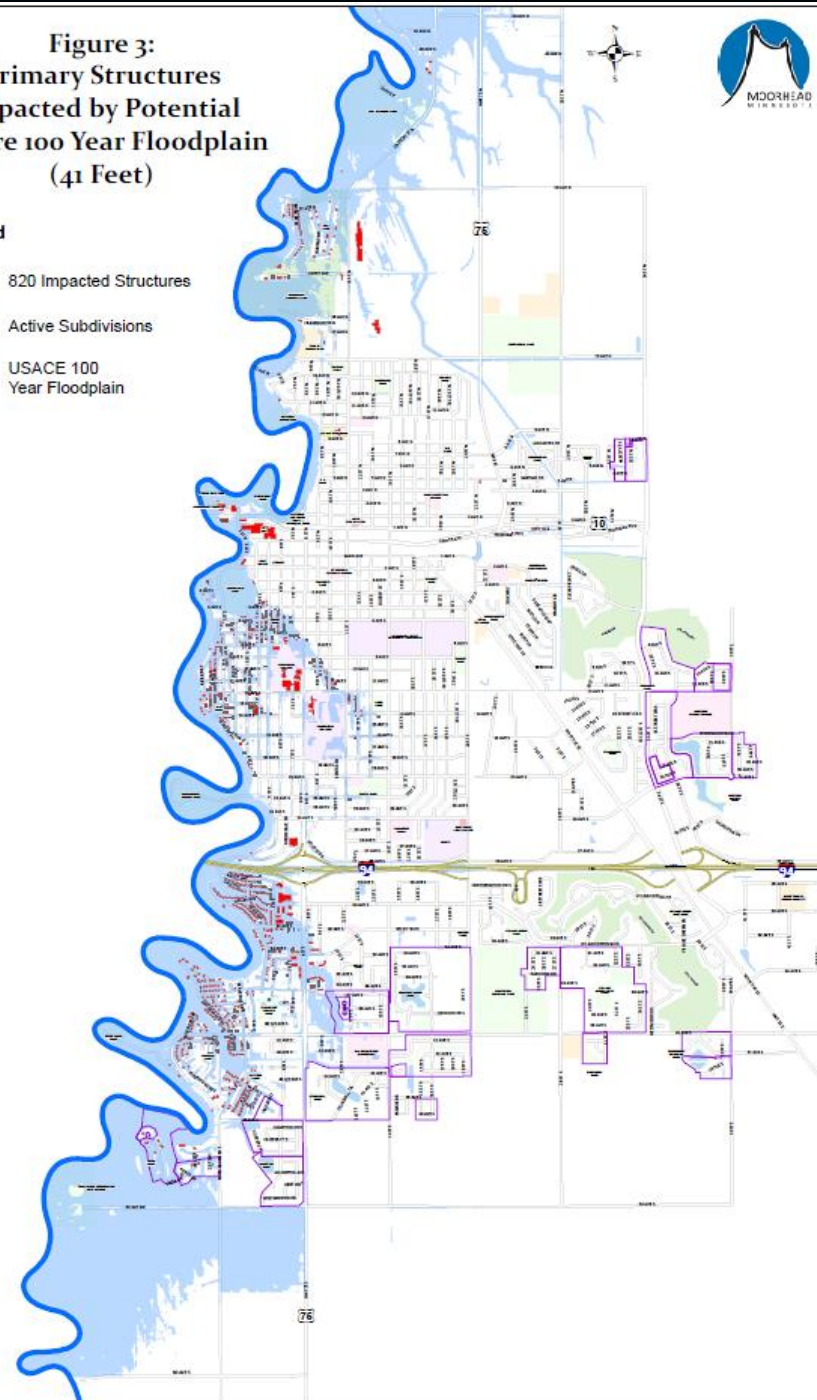
Future 100-year Floodplain Impacts

- Existing levees not accreditable
- 820 existing primary structures
 - Estimated market value: \$396M
 - Millions \$ in flood insurance premiums
 - Negative impact to property values & neighborhood character
- *Mitigation required:*
 - Additional acquisitions
 - Additional infrastructure
- *FM Diversion*

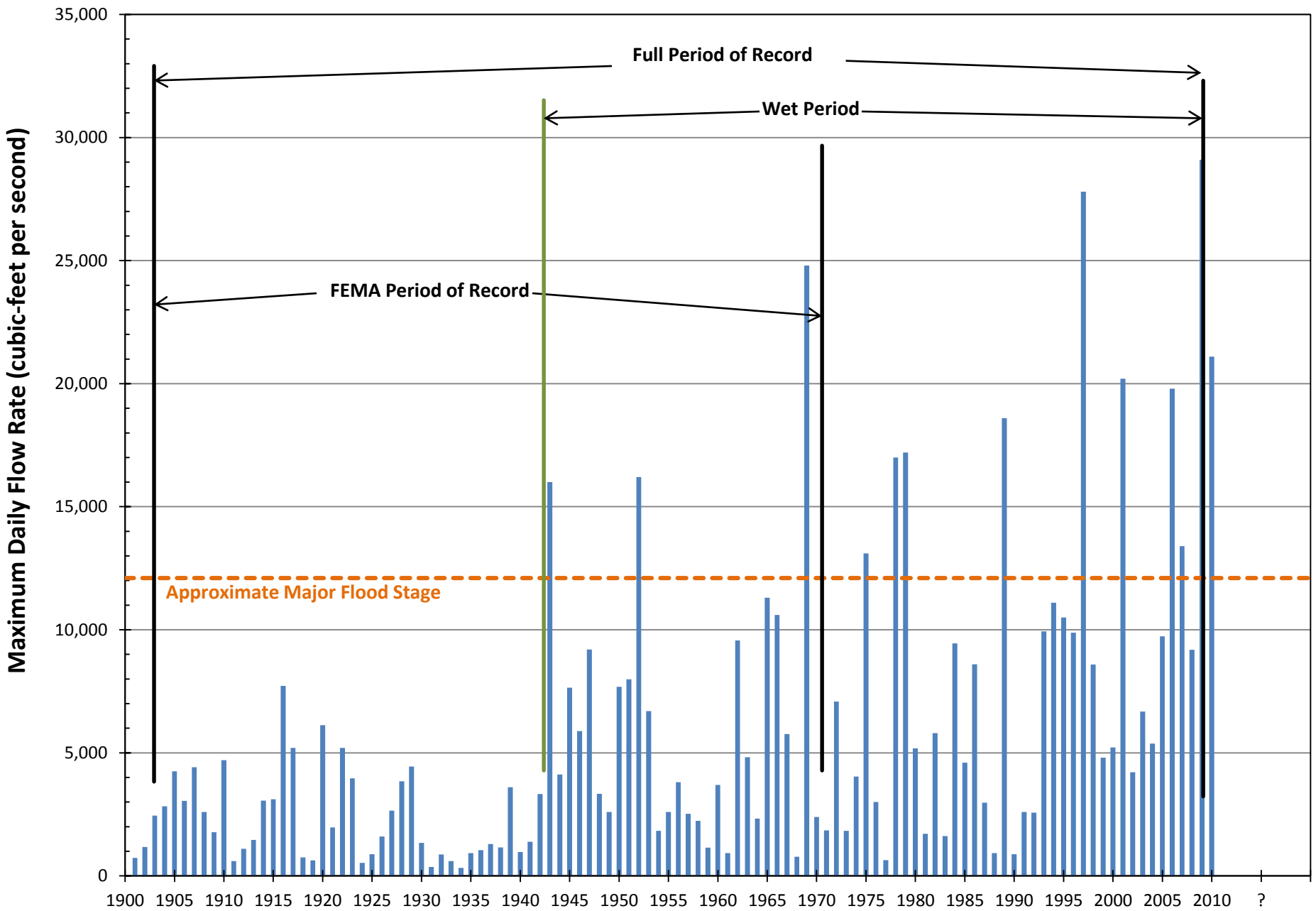
Figure 3:
Primary Structures
Impacted by Potential
Future 100 Year Floodplain
(41 Feet)

Legend

- 820 Impacted Structures
- Active Subdivisions
- USACE 100 Year Floodplain



Red River of the North at Fargo, North Dakota



Hydrology Summary

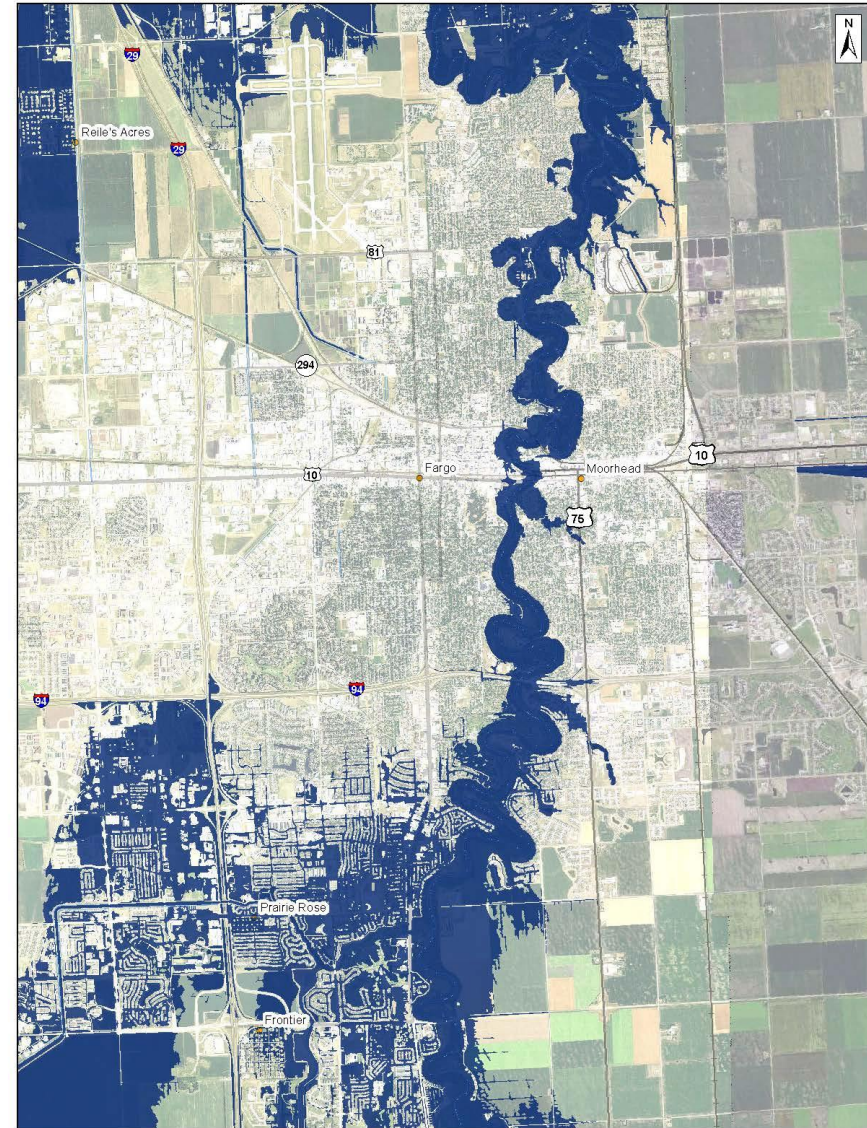
Red River of the North at Fargo

Event	FEMA Effective (cfs)	Full Period of Record (cfs)	Wet Cycle (cfs)
10-year	10,300	13,865	17,000
50-year	22,300	26,000	29,300
100-year	29,300	33,000	34,700
500-year	50,000	66,000	61,700

Existing Flood Risk

FEMA (100-year) Floodplain:

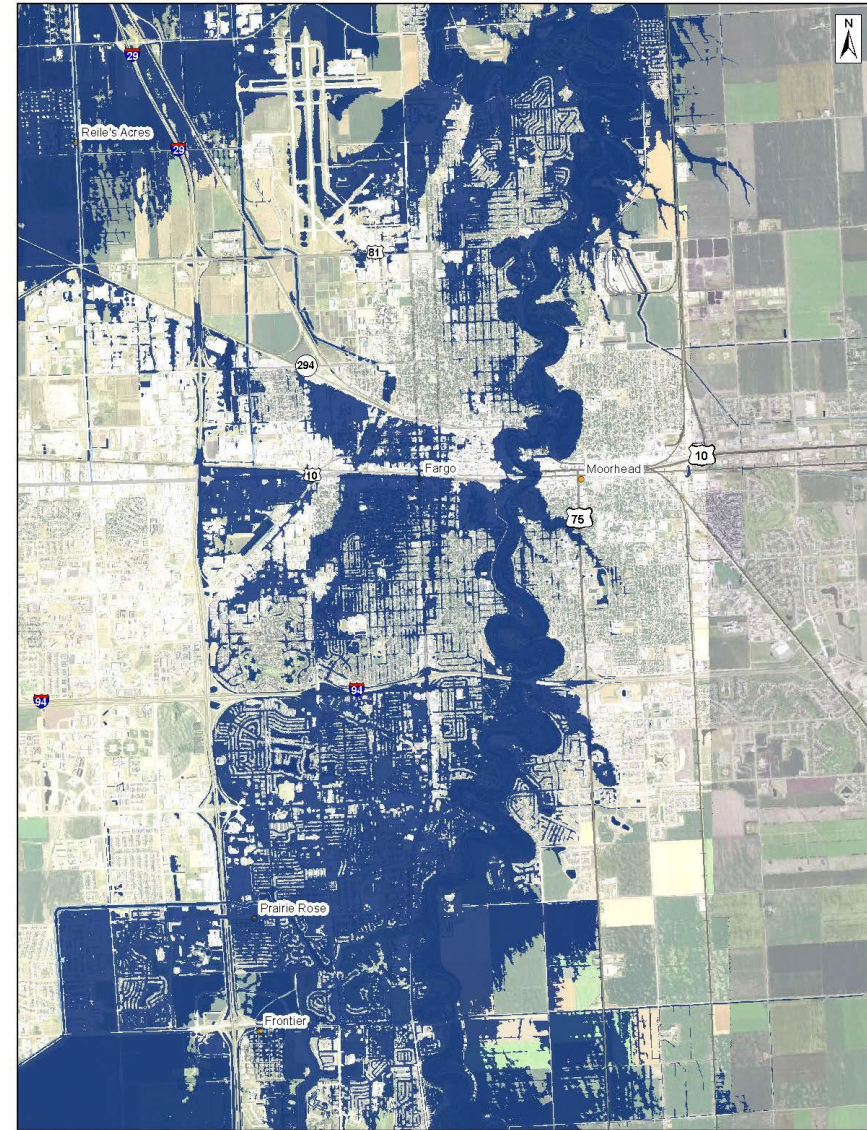
- *Regulatory floodplain developed by FEMA and adopted by local communities.*
- *Properties in the floodplain with a federally backed mortgage are required to carry flood insurance.*



Existing Flood Risk

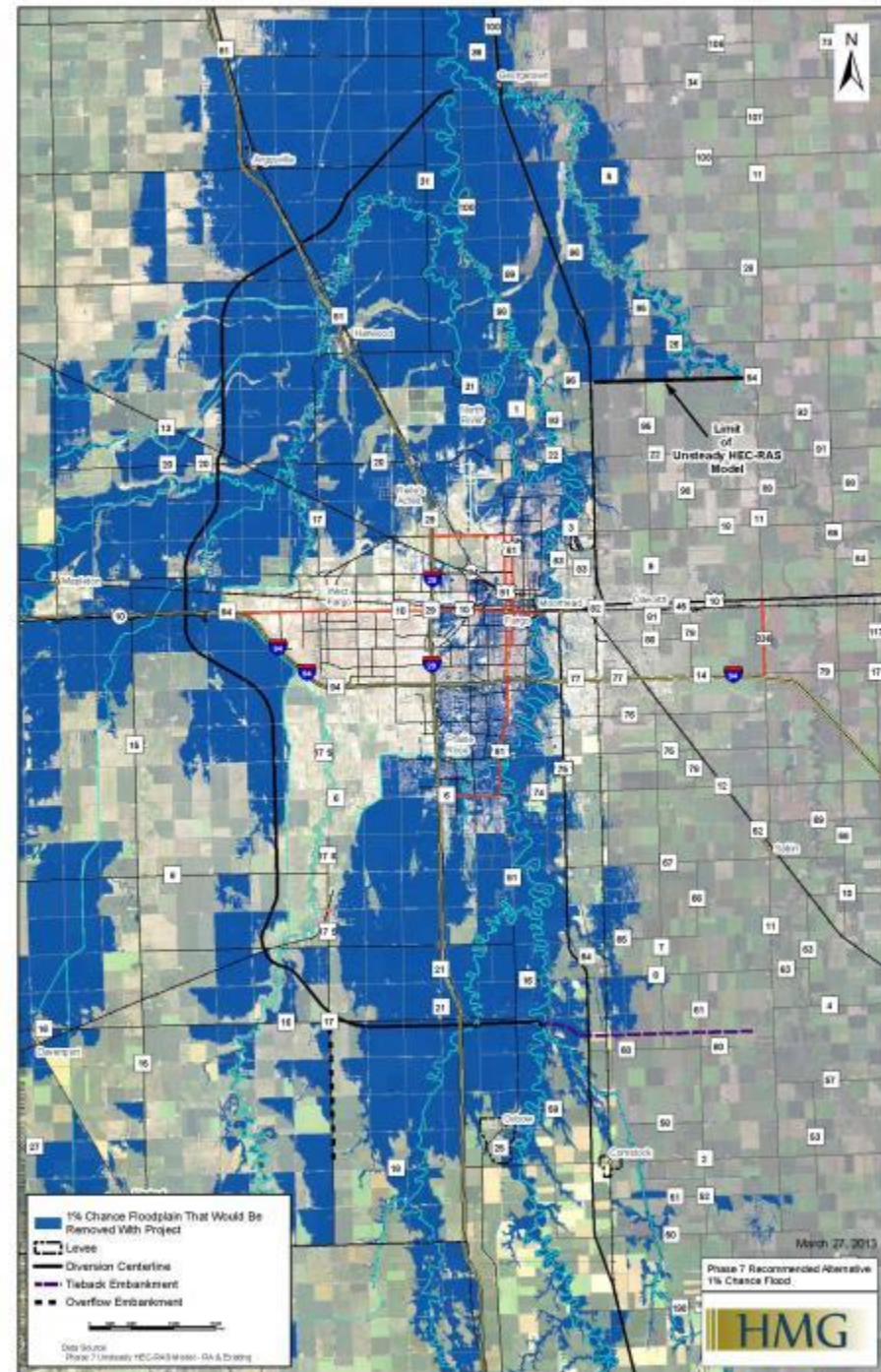
USACE (100-year) Floodplain:

- *Flood inundation area developed by the USACE during feasibility.*
- *Used to assess flood risk and assign project benefits.*
- *May lead to future map updates by FEMA.*



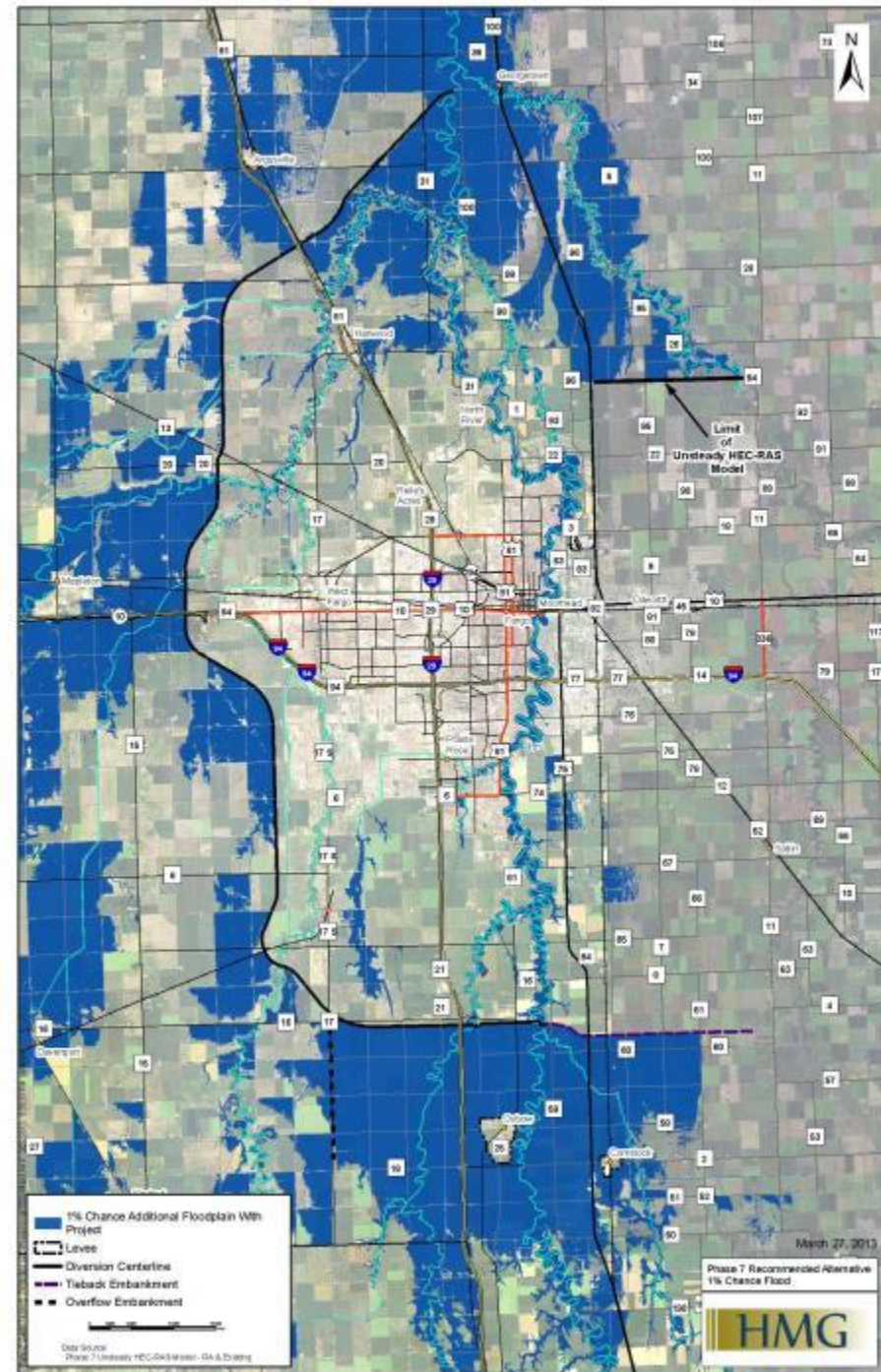
Flooding Without The Diversion

💧 Blue = Existing 100-year
Floodplain (USACE)



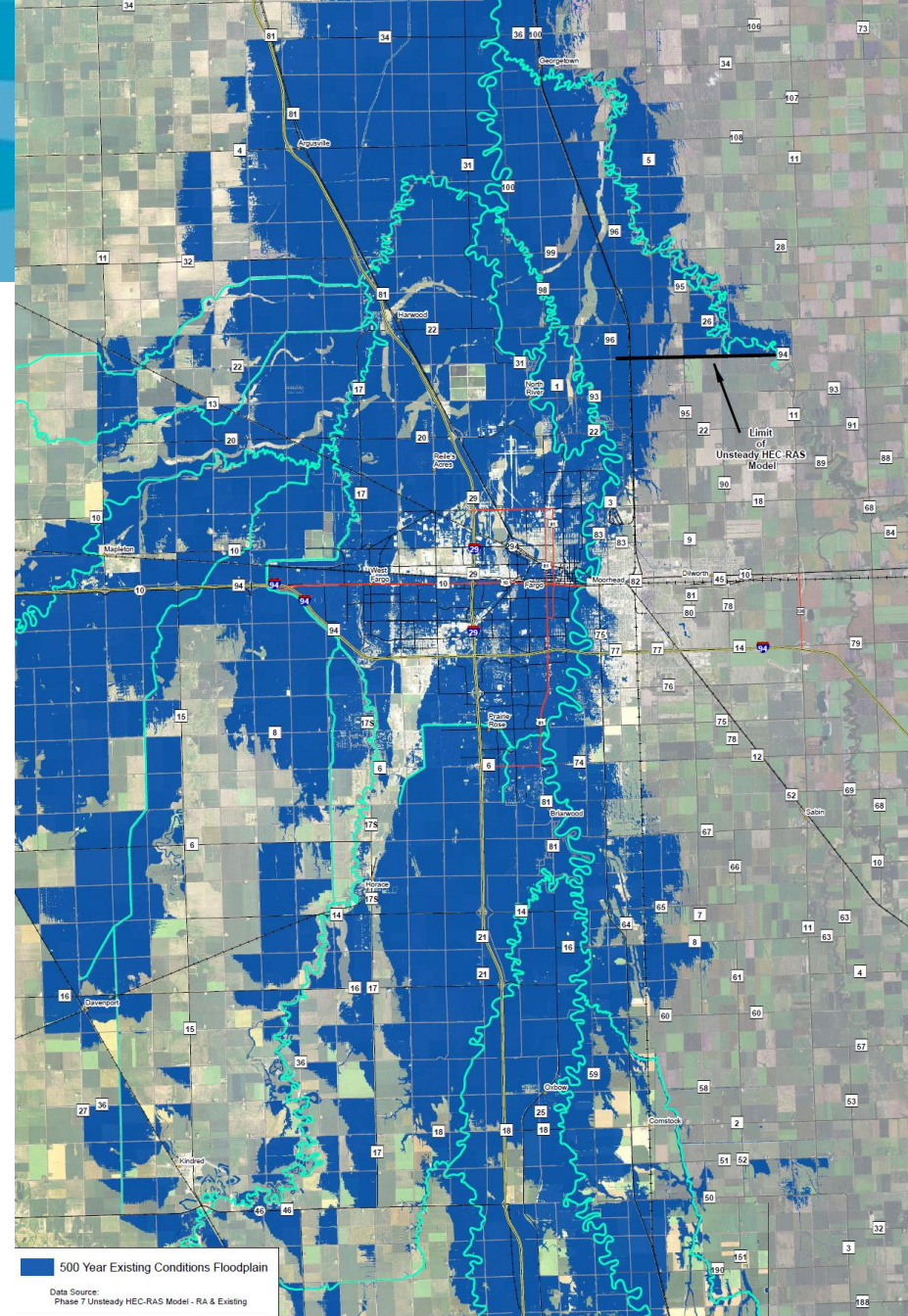
Flooding With The Diversion

💧 **Blue = With Project 100-year
Floodplain (USACE)**



FM Area Flooding Without The Diversion (500-year)

Blue = Existing 500-year Floodplain (USACE)



500 Year Existing Conditions Floodplain

Data Source:
Phase 7 Unsteady HEC-RAS Model - RA & Existing

**Phase 7 Existing Conditions
500 Year Floodplain**

Created By: erin@hmg Date Created: 6/10/2014 Date Exported: 6/10/2014 Image: 2012 County NAD Srv: State Data (W) LDMAP
Project: 102074312_7431_20110610/Phase7 - Update/RAS/Level1.mxd
Project Path: 102074312_7431_20110610/Phase7 - Update/RAS/Level1.mxd

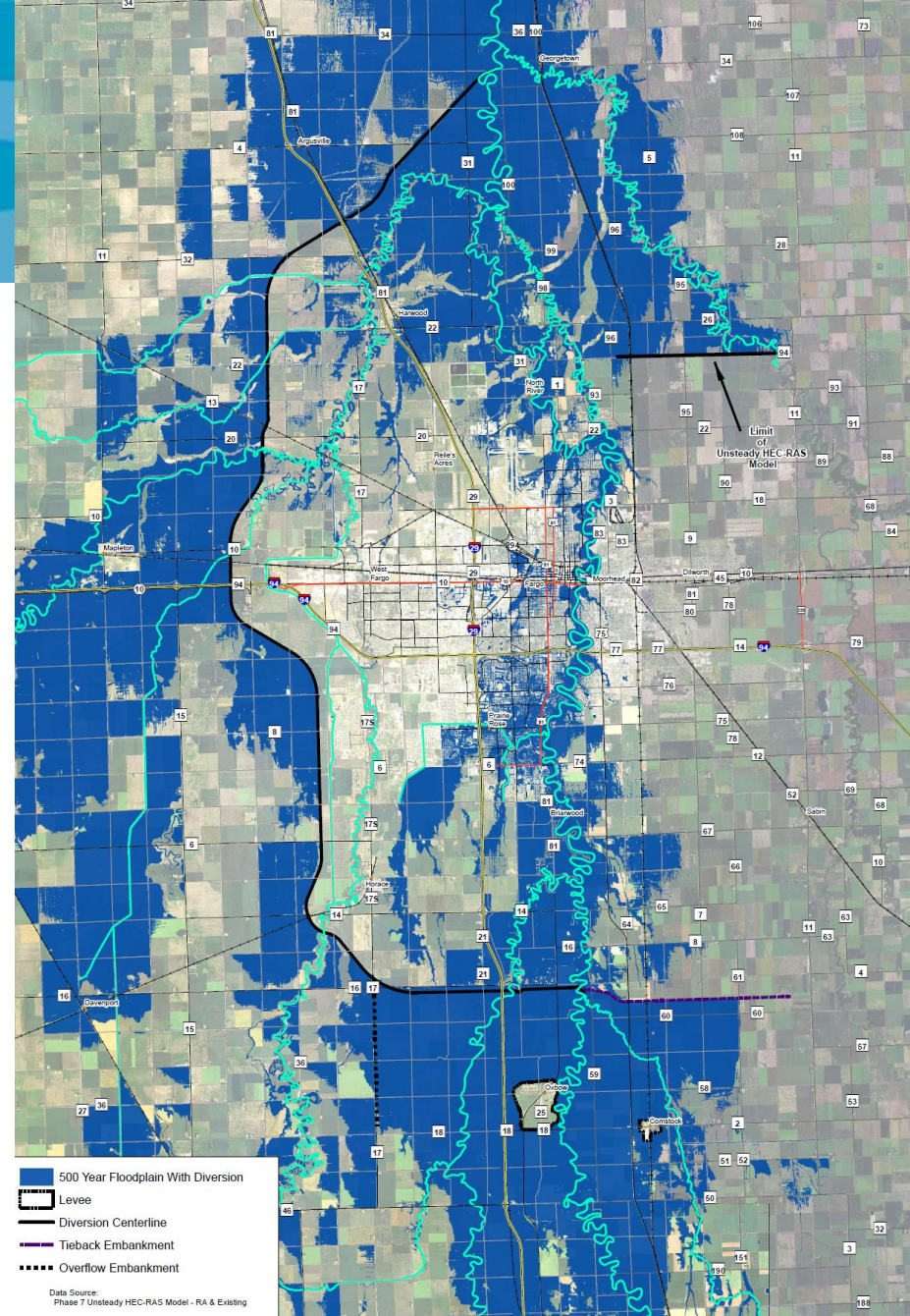


0 0.75 1.5 3
Miles

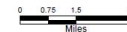
HMG

FM Area Flooding With The Diversion (500-year)

Blue = With Project 500-year Floodplain (USACE)



Phase 7 With Diversion
500 Year Floodplain



Federal Project

Diversion Project Receives Federal Authorization

- 💧 President Obama signed the Water Resources Reform and Development Act (WRRDA) in June 2014
- 💧 WRRDA authorized construction to move forward on the Fargo-Moorhead Area Diversion Project.
- 💧 WRRDA authorized \$846 Million in federal funds for the Project
- 💧 Diversion was 1 of 26 water projects authorized



Federally Authorized Project

Provides risk reduction:

to the greatest amount of infrastructure

for the greatest number of people

from multiple river systems

- Red River
- Wild Rice River
- Sheyenne River
- Maple River
- Rush River
- Lower Rush River



Authorized Project Makes Sense

- 💧 **1 in 5** of all North Dakotans will benefit from flood risk reduction
- 💧 **\$19 Billion** = Property Value Receiving Flood Risk Reduction Benefits
- 💧 **\$5.48 Billion** = Wages in the F-M Metro Area
- 💧 **\$14.5 Billion** = Annual F-M Gross Domestic Product
- 💧 **\$213 Million** = Annual Income & Sales Taxes Generated for North Dakota from F-M Metro
- 💧 **\$87 Million** = Annual Income & Sales Taxes Generated for Minnesota from F-M Metro

*Data from the Greater Fargo-Moorhead EDC

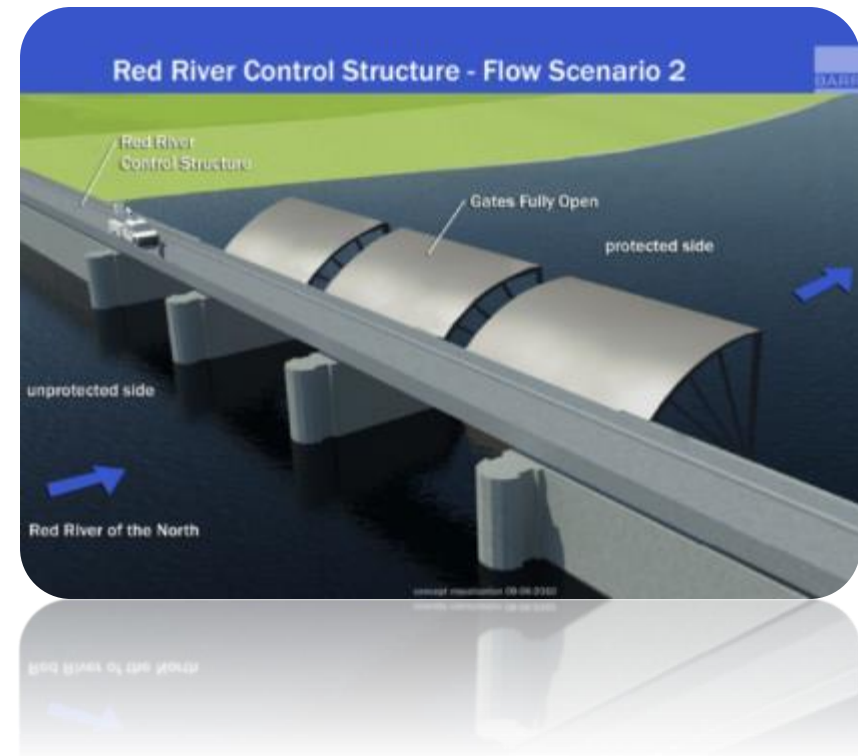
Timeline of Federal Actions

- Feasibility Study Began Sep 2008
- Flood of Record Spring 2009
- Chief's Report Signed Dec 2011
- Record of Decision Signed Apr 2012
- Water Resource Reform Development Act June 2014
- Federal Appropriations &
New Starts for USACE Approved Dec 2015
- Federal Appropriation for Construction Feb 9, 2016
- Project Partnership Agreement Executed July 11, 2016
- *Anticipated Federal Construction Contract* Sept 2016

Federal Feasibility Study

Multiple Alternatives Considered

- **Non-structural**
- **Levees/floodwalls**
- **Upper basin storage**
- **Retention/controlled field runoff**
- **Diversion channels**
- **Combinations**
 - Diversions and Levees
- **Various levels considered**
 - 10,000 to 45,000 cfs capacity diversions
 - Up to 1-percent chance levees
- **Levees alone unable to achieve certifiable 1% risk reduction**



Public Involvement

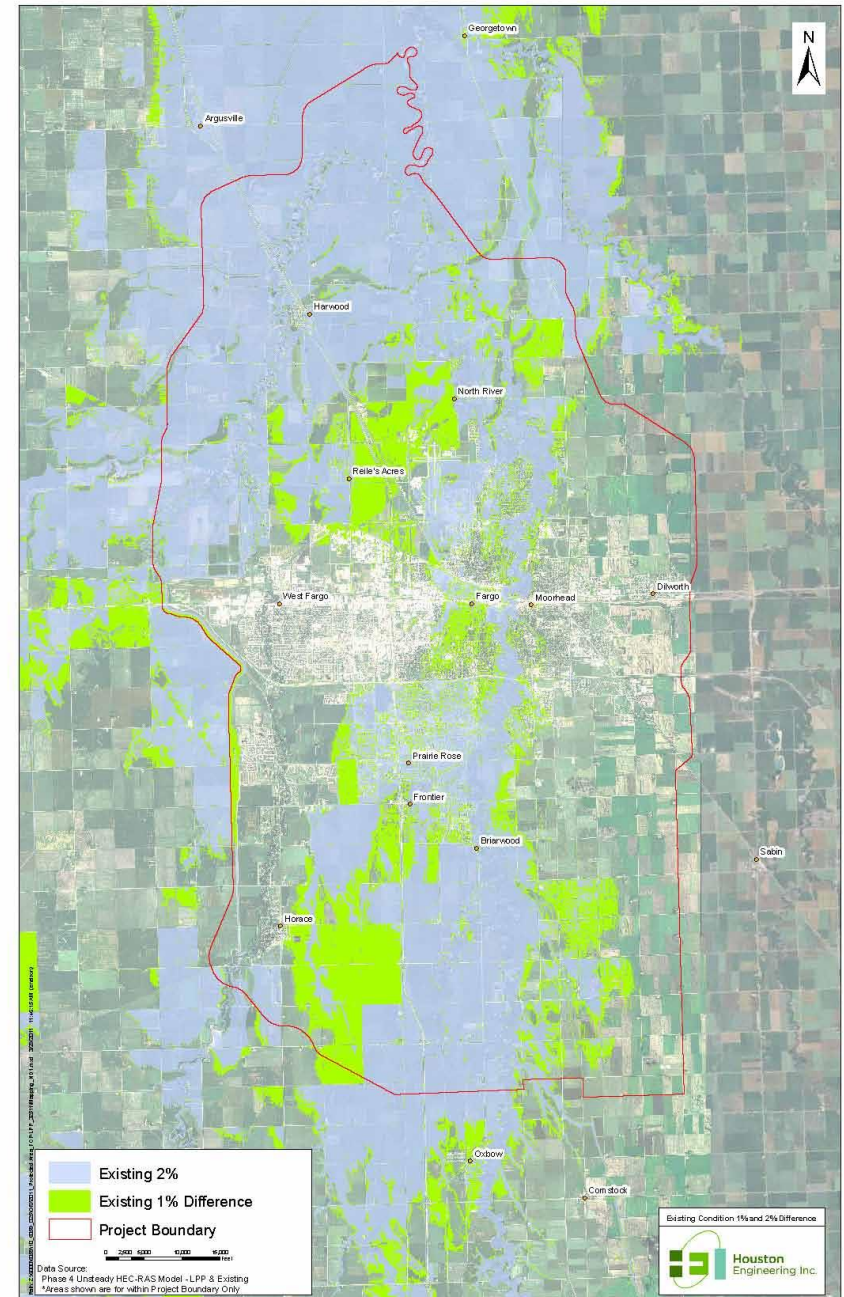


During feasibility study, 51 Public meetings held to inform and gather input from Nov 2008 to Jun 2011

- 💧 (4) Scoping meetings
 - 💧 (3) Metro Flood Management Committee
 - 💧 (5) Public information
 - 💧 (11) NEPA public review
 - 💧 (1) 404(b) hearing
 - 💧 (27) Metro Flood Work Group
-
- 💧 430 Agencies and members of the public commented on the Study
 - 💧 1600 pages of comments were responded to

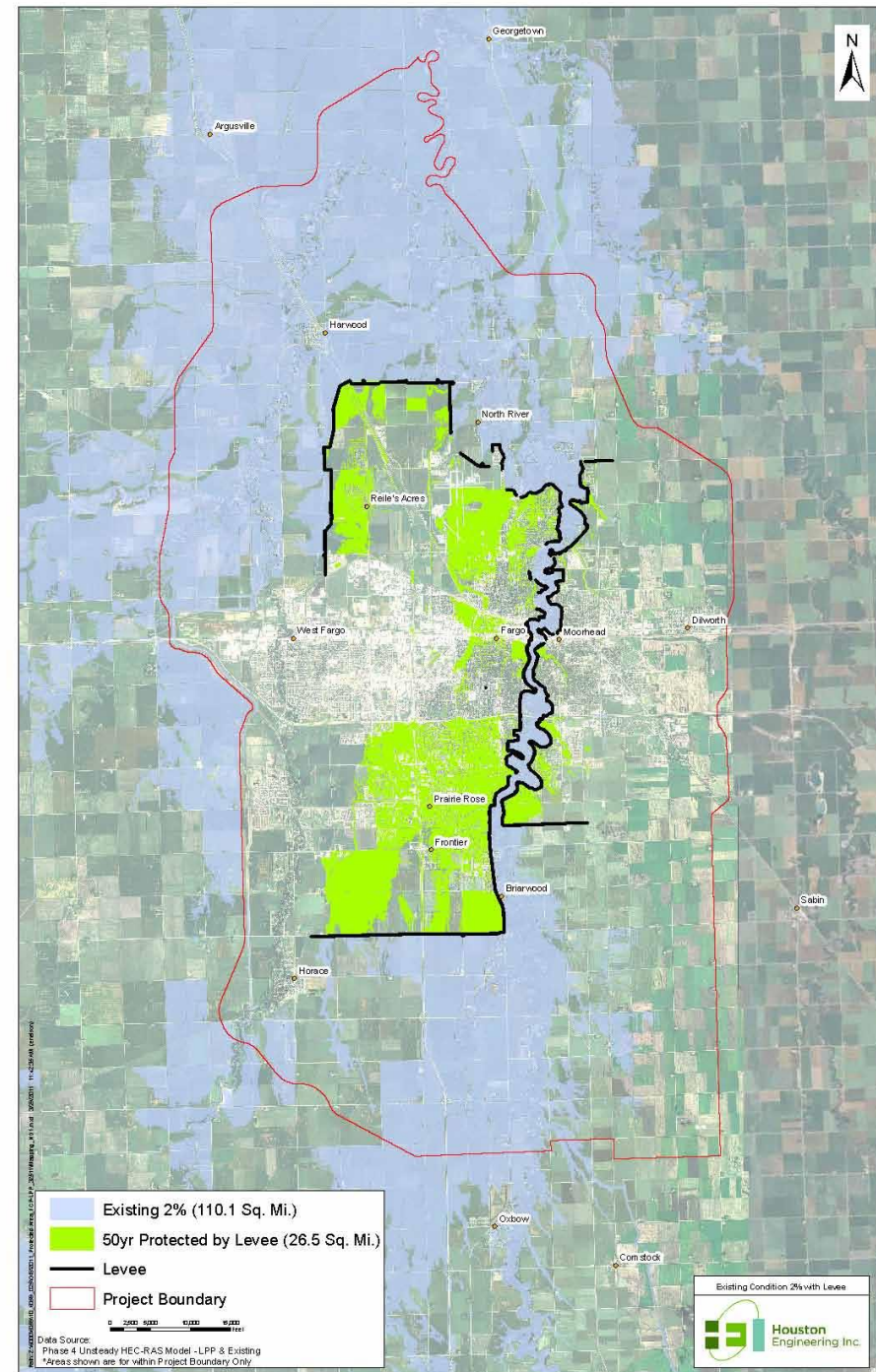
Upstream Retention

- 400,000 AF of storage needed for 1.6 ft stage reduction during 100 Year flood (USACE)
- 270,000 AF of storage needed to provide 2 ft reduction during 1997 flood (<50-year) (RRBC)
- Location of runoff could limit effectiveness
- Important long-term water management strategy



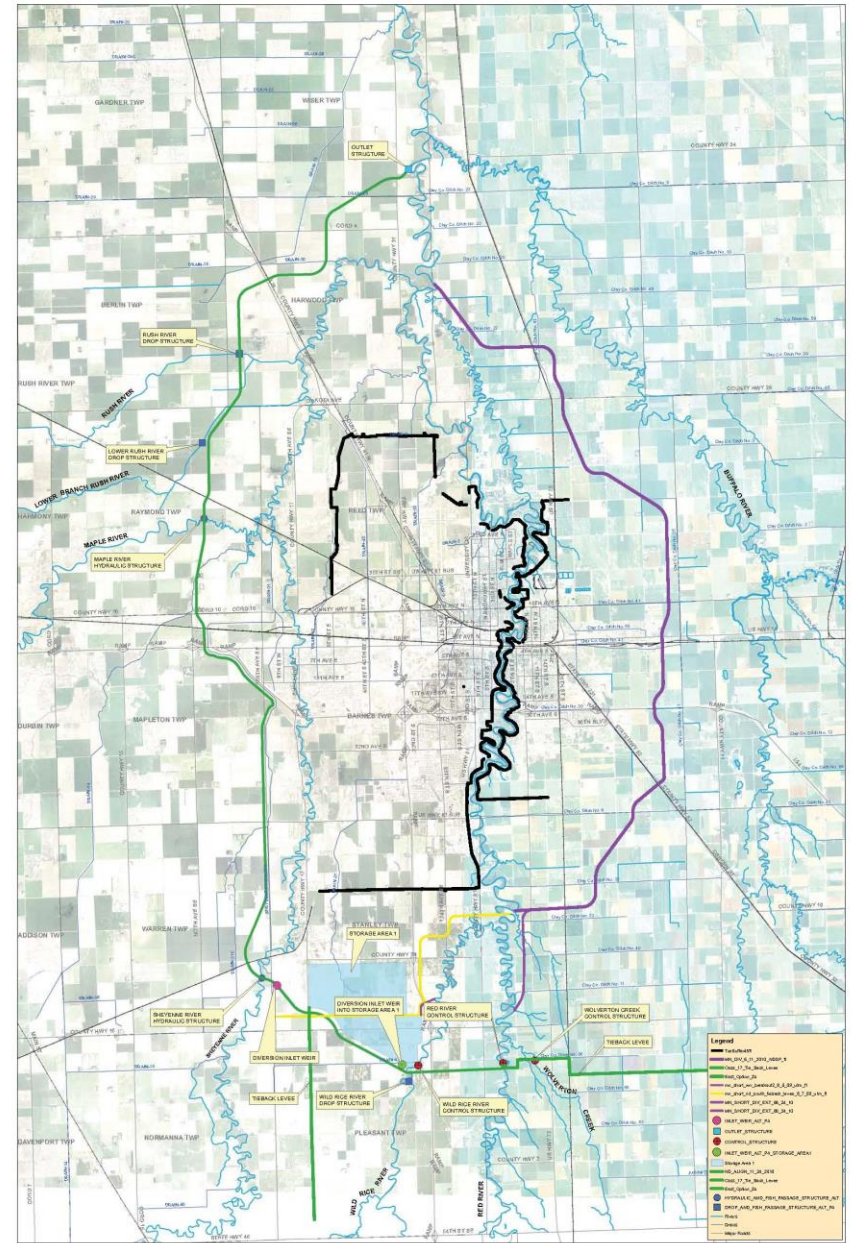
Levee Only Alternative

- Max. level of protection of approx. a 50-year flood (USACE).
- Flood insurance will still be required.
- Potential upstream and downstream impacts – mitigation will increase cost.



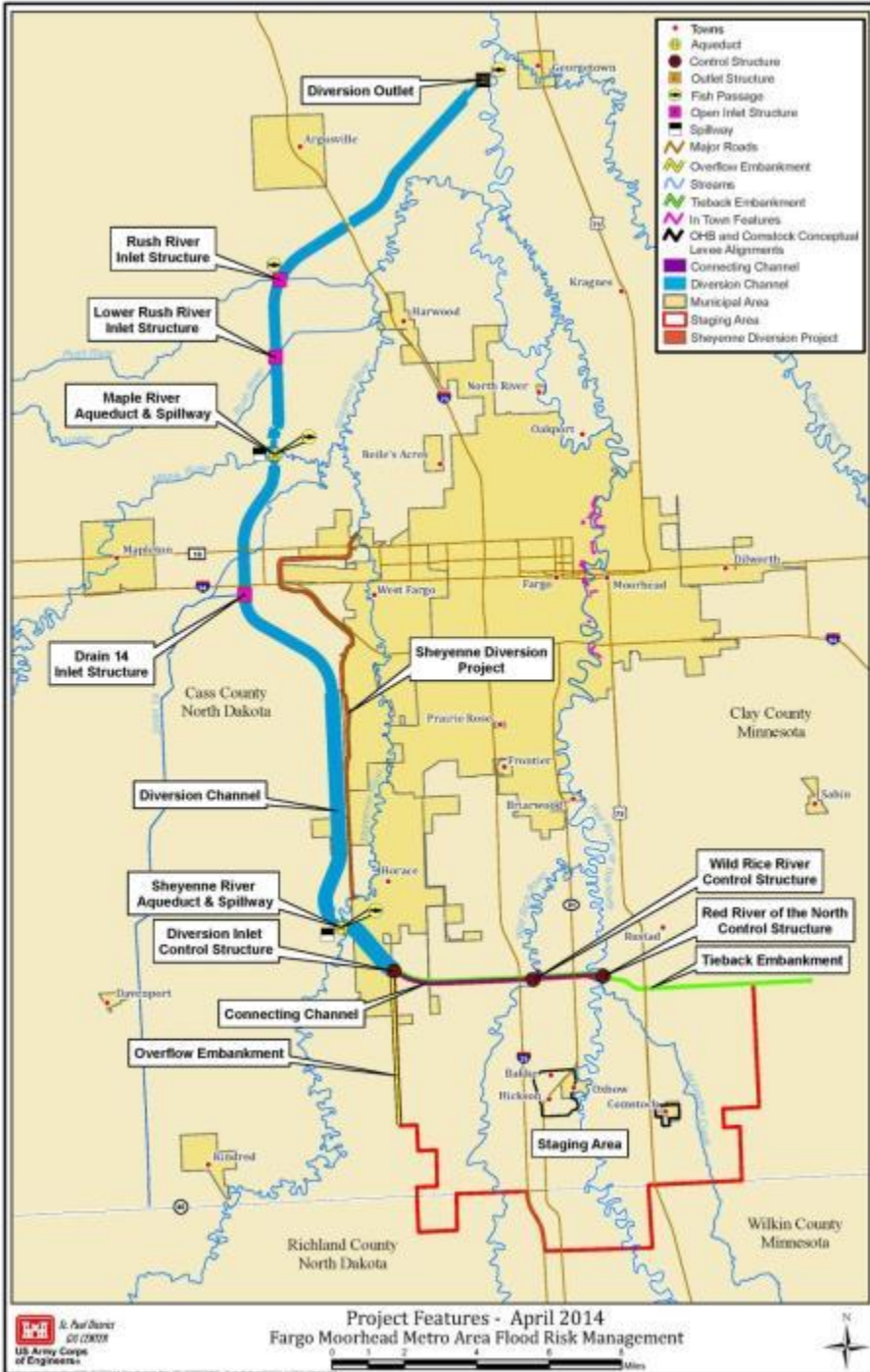
Diversions

- Proven track record of success in the Red River basin.
- Ability to provide 500-year or greater level of flood damage reduction – existing and planned levees help to achieve this.
- Increased area of protection.



FM Area Diversion Project

- 💧 Federally Authorized Project
- 💧 Completed Environmental Impact Statement of all alternatives
- 💧 1,600 ft wide Diversion Channel in ND with 150,000 acre-feet of Upstream Staging
- 💧 Outlet near Georgetown, MN
- 💧 Inlet north of Oxbow, ND
- 💧 Provides 100-year Flood Risk Reduction
- 💧 Extreme Events are Flood-Fightable



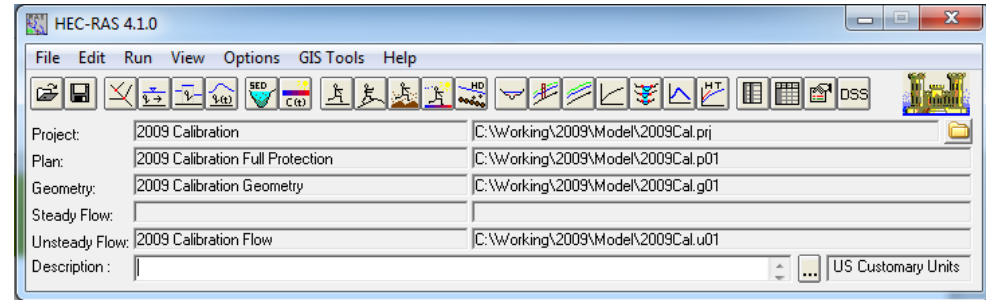
Hydraulic Analyses

Hydraulic Analyses

Unsteady HEC-RAS

💧 Design

💧 Impact Analysis

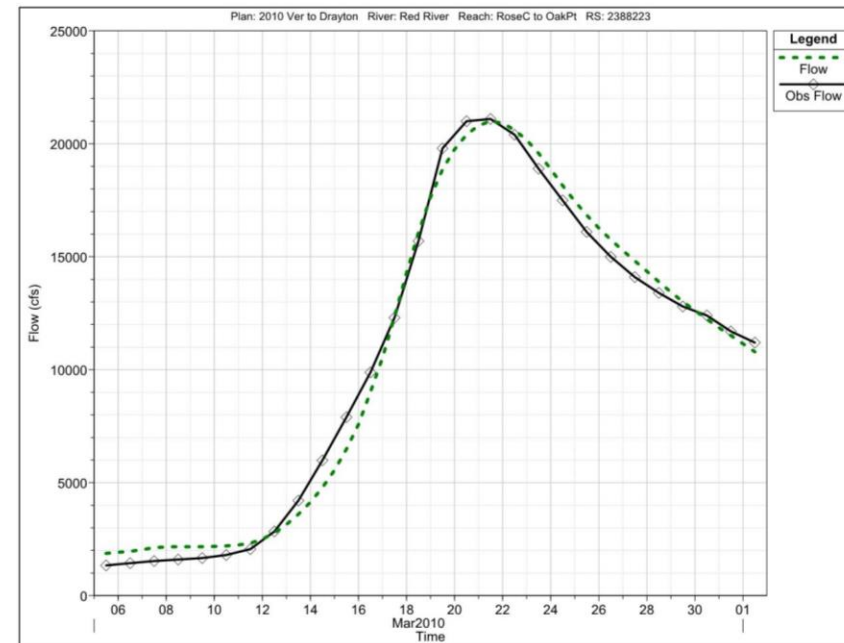


Historic Calibration/Verification Events:

- 1997, 2006, 2009, 2010, 2011, 2013

Synthetic Design Events:

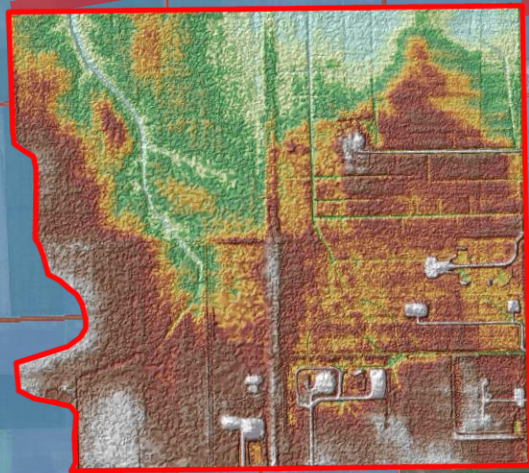
- 10-, 25-, 50-, 100-, 500-year, SPF, PMF

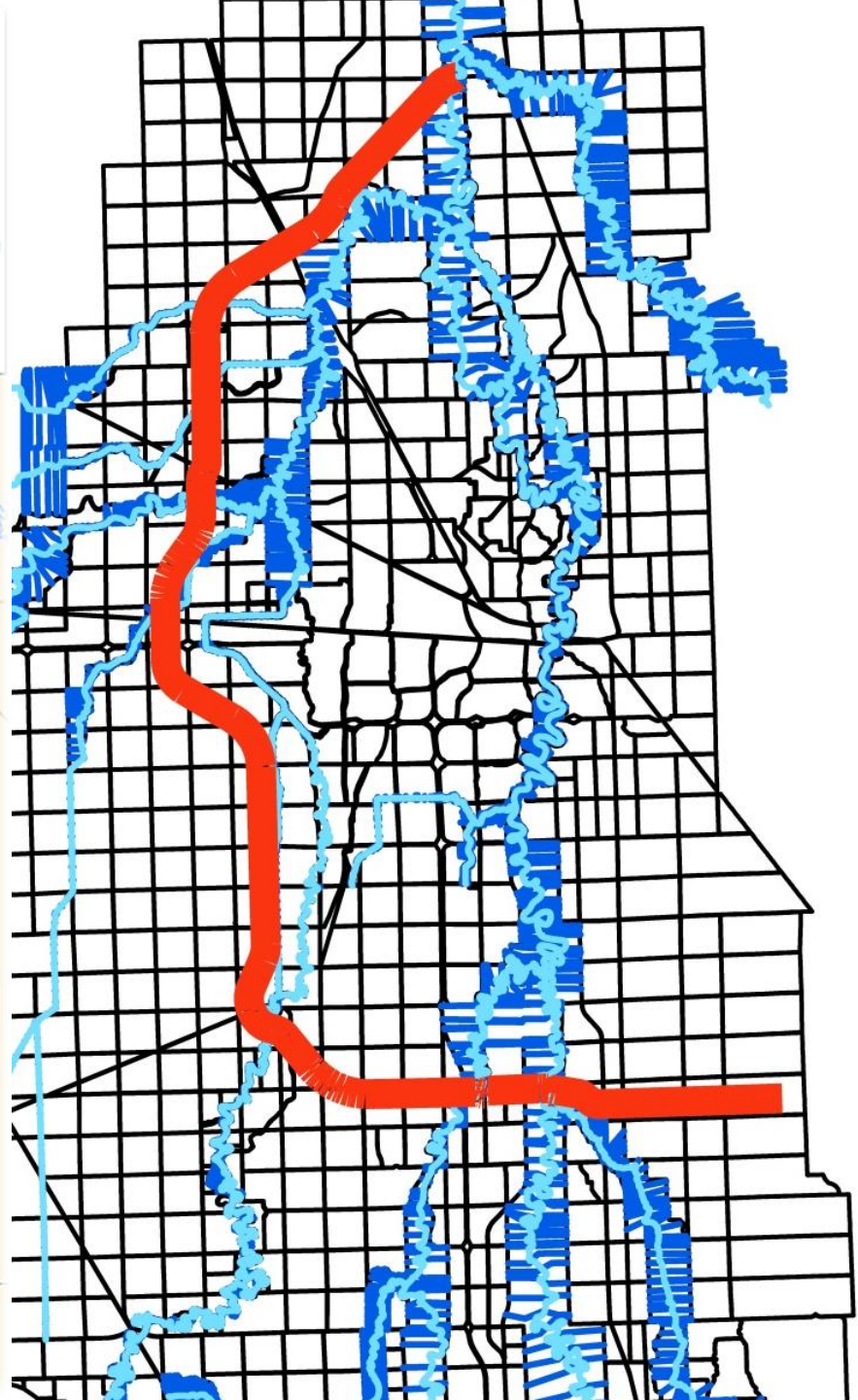
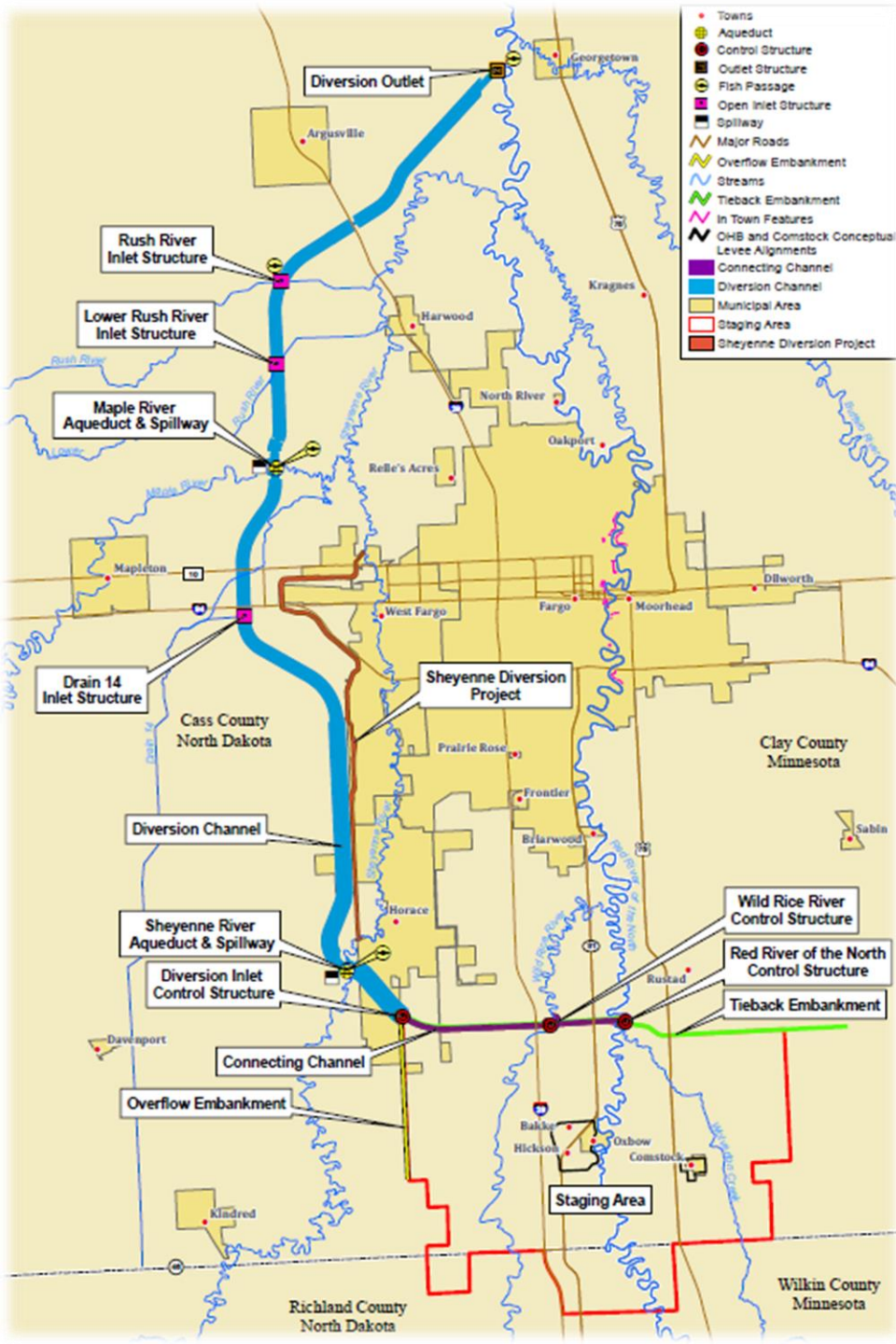


Hydraulic Analyses

Unsteady HEC-RAS

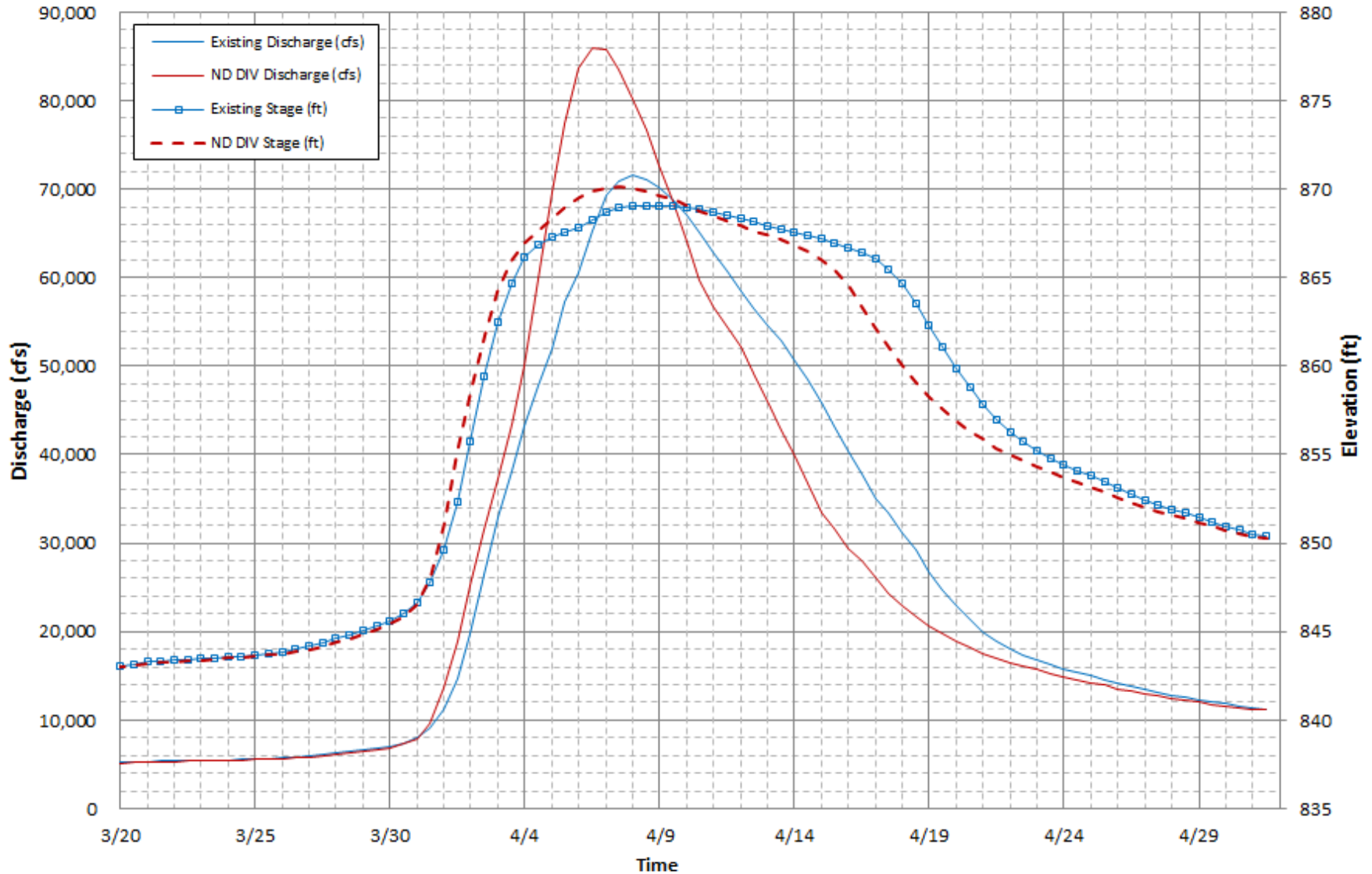
- Cross Sections
- Storage Areas





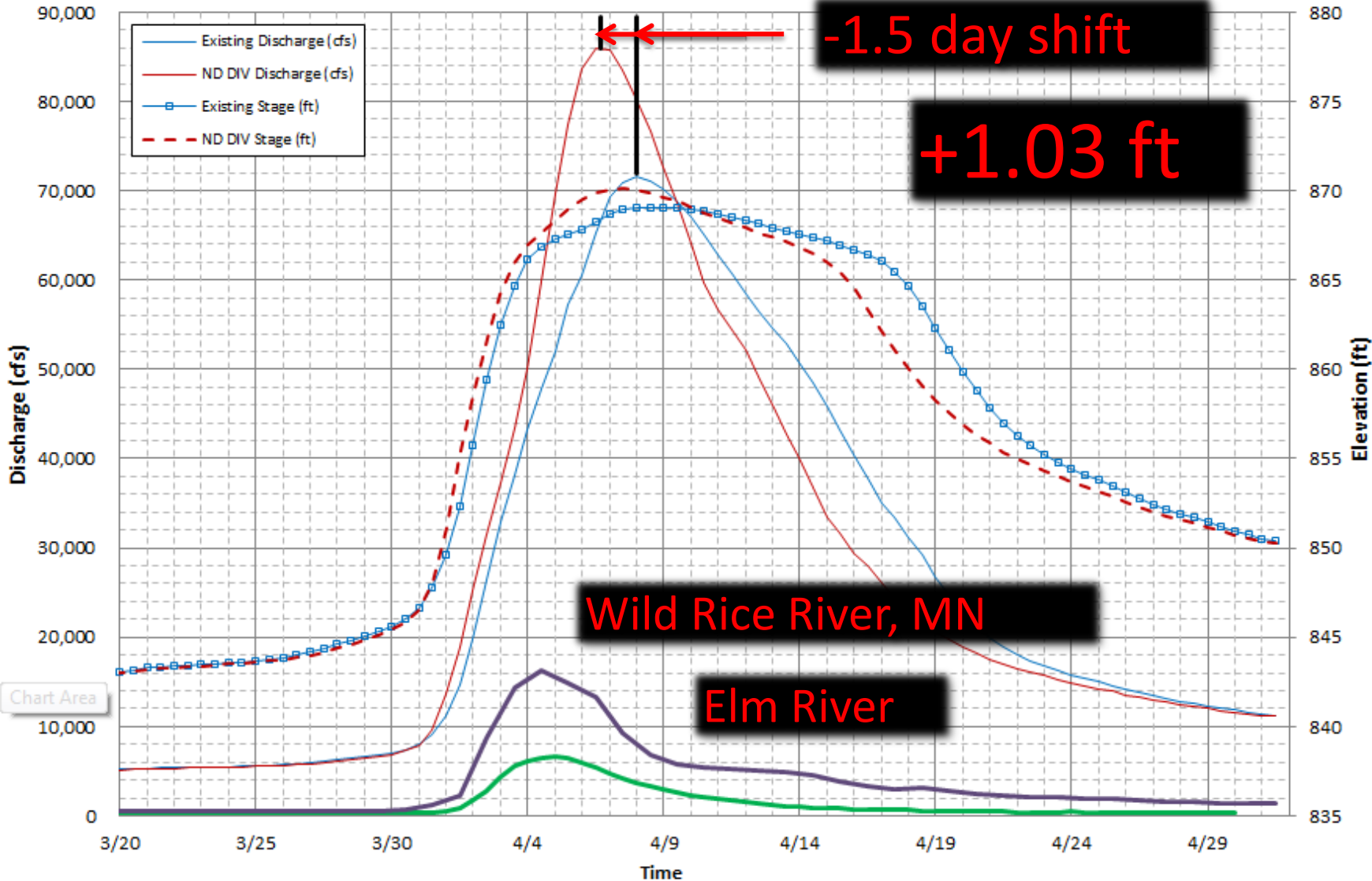
Downstream Impacts

Red River 1-Percent Chance Event, Stage and Discharge Comparison
North Dakota Diversion (LPP) vs. Existing Conditions (no emergency protection)
Halstad, MN



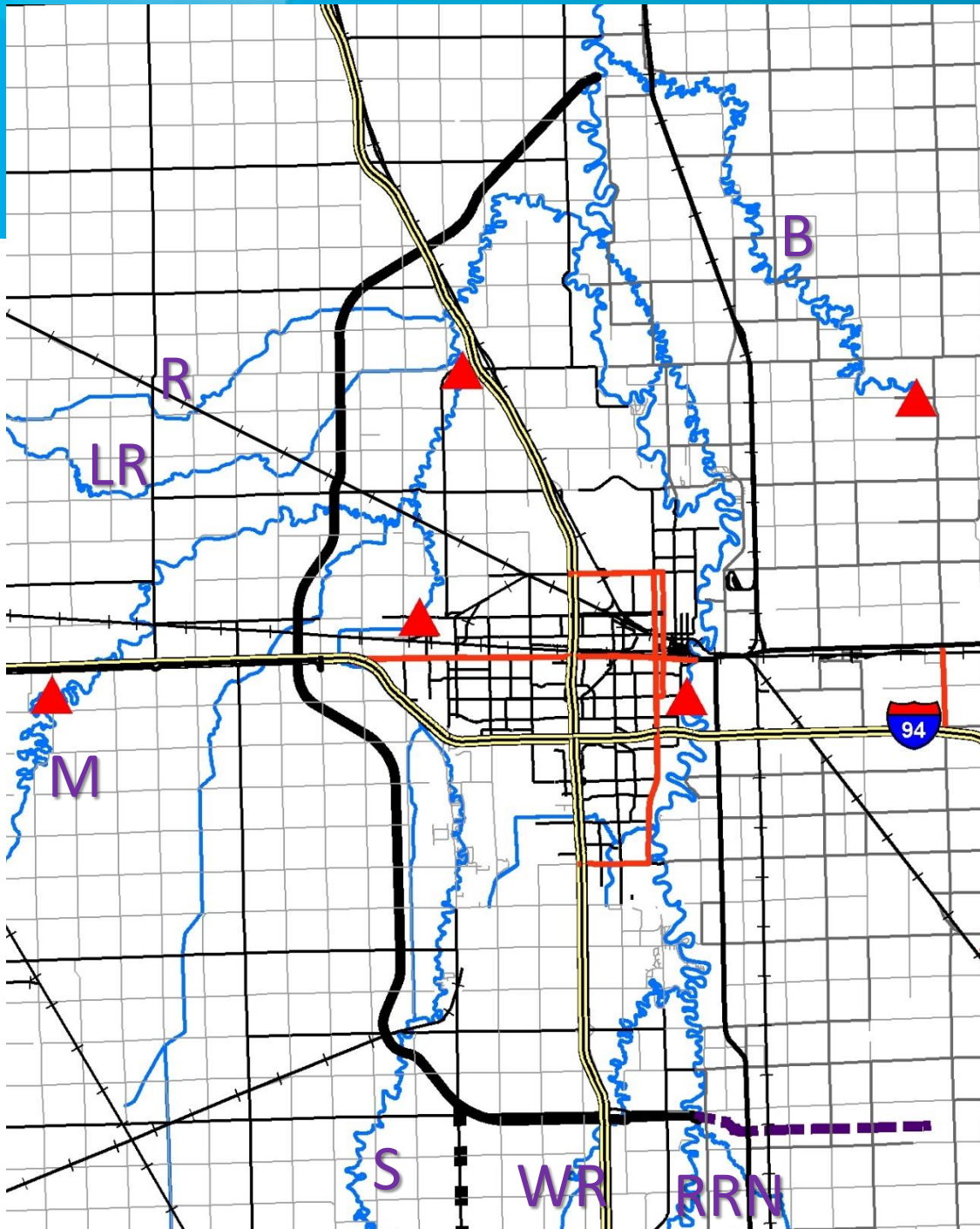
Downstream Impacts

Red River 1-Percent Chance Event, Stage and Discharge Comparison
North Dakota Diversion (LPP) vs. Existing Conditions (no emergency protection)
Halstad, MN



Impacts

1. Travel Time
2. Floodplain Storage



Diversion
(35 mi.)

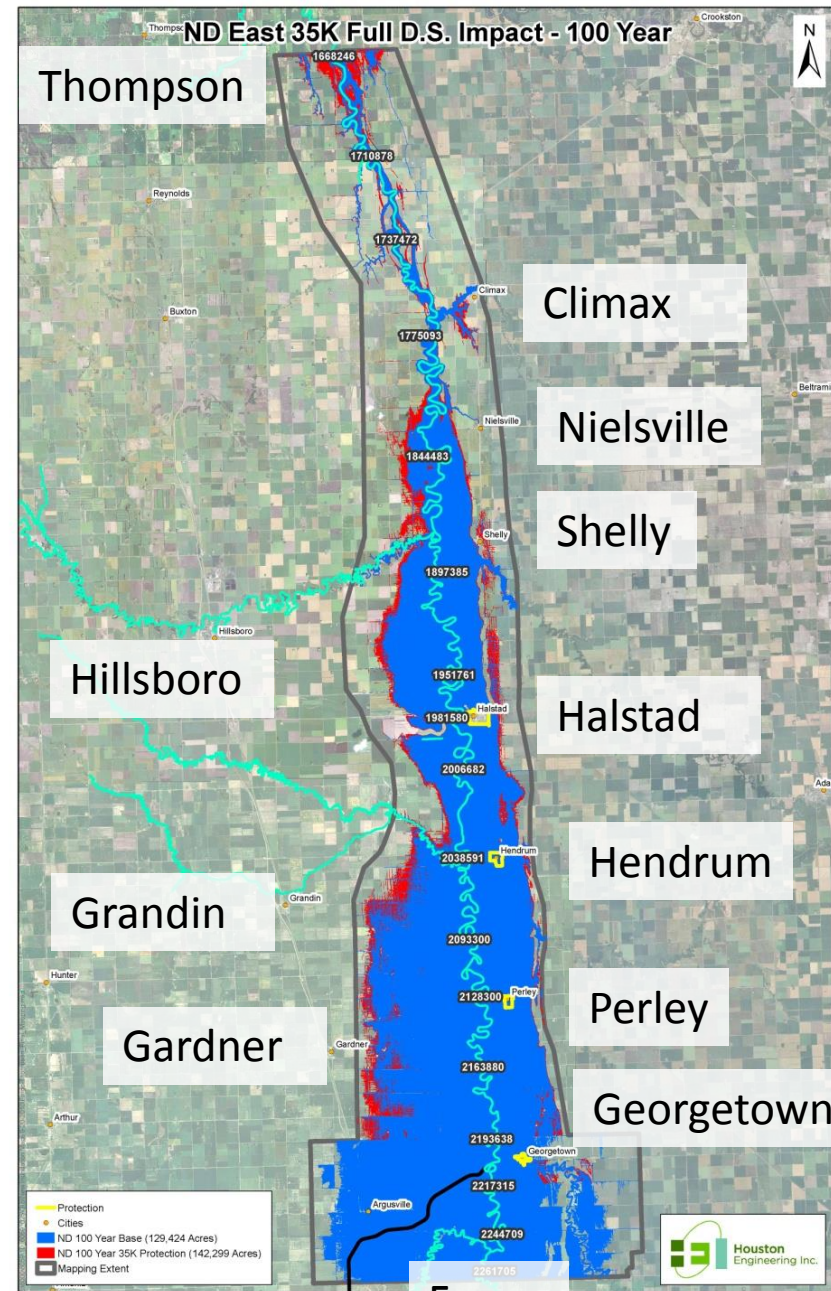
Red River
(60 mi.)



Length
Time

Downstream Impacts (Phase 3)

Location	Stage Increase (inches)
Minnesota Short 35K - 100 Year	
Climax	12.5
Halstad Gage	6.7
Hendrum	6.8
Perley	4.8
Georgetown	4.7
North Dakota 35K - 100 Year	
Climax	25.4
Halstad Gage	10.7
Hendrum	10.7
Perley	6.6
Georgetown	7.1

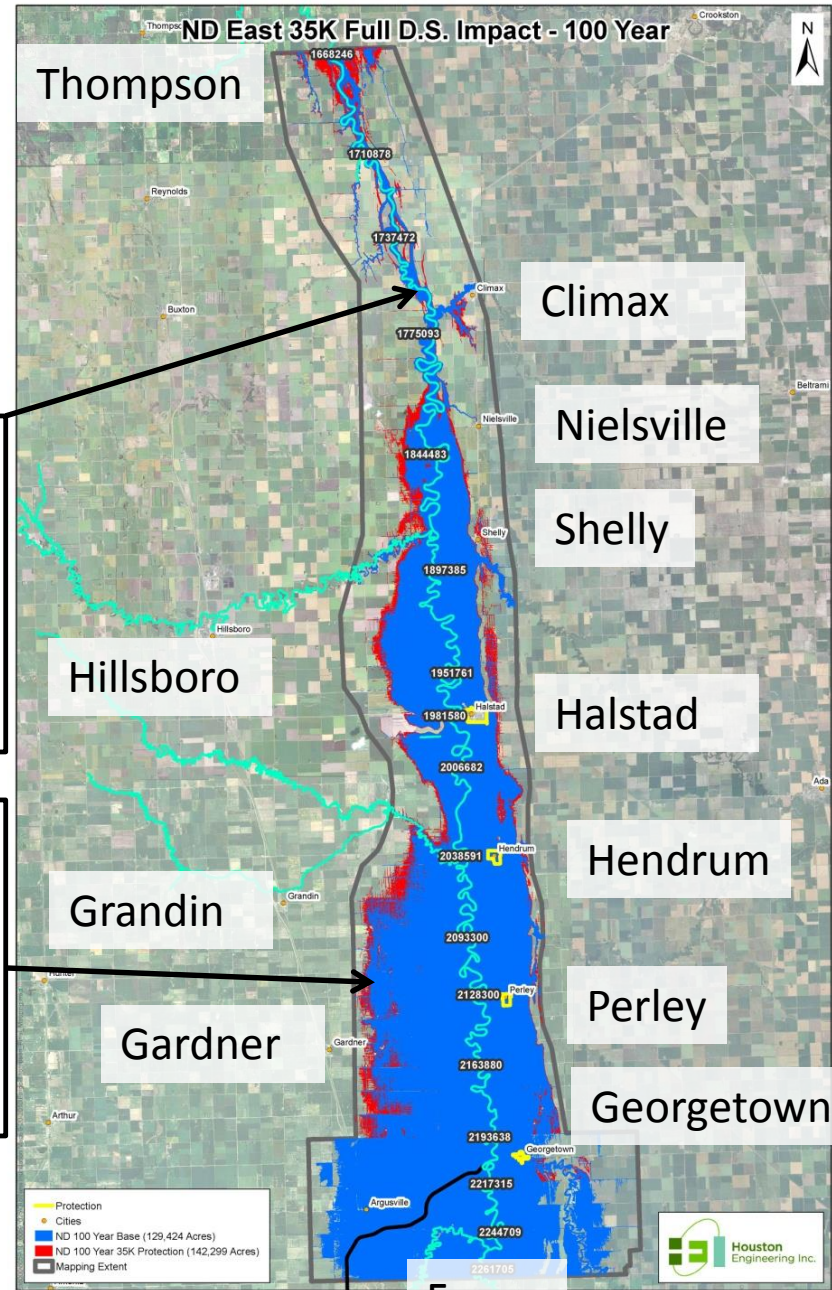


Downstream Impacts (Phase 3)

Narrow Floodplain

Wide Floodplain

Control Structure Gate
Operation

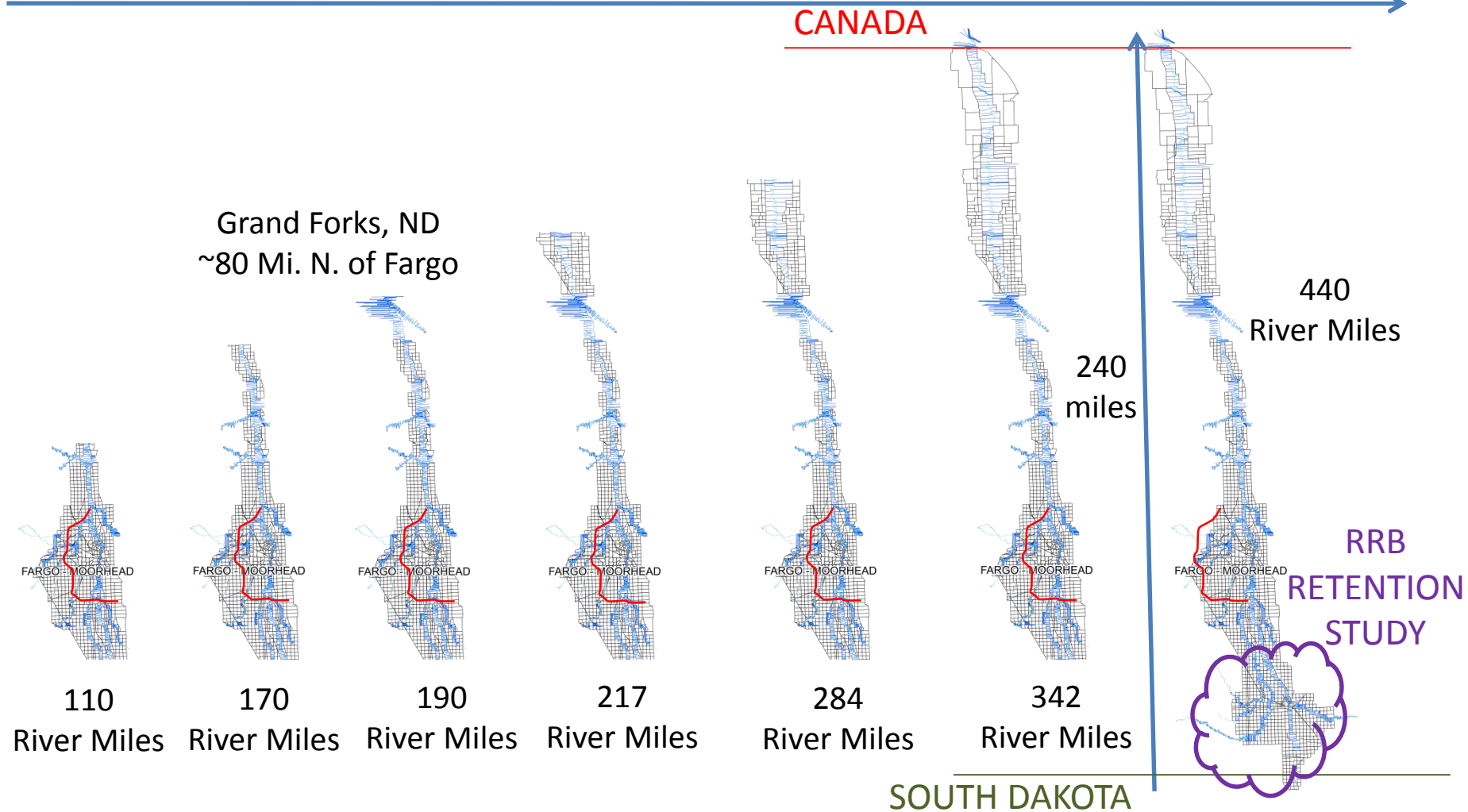


HEC-RAS Model Development

Modeled River Miles on the Main Stem of the Red River

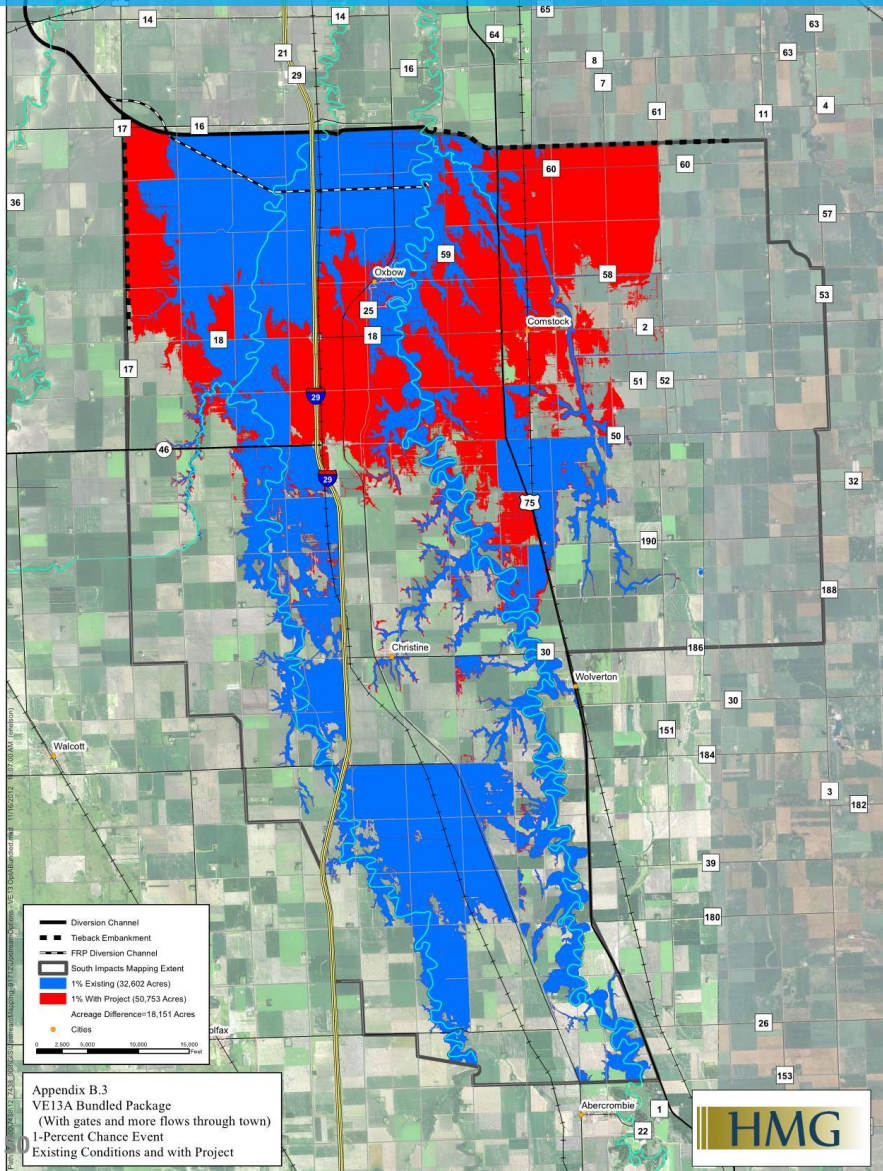
2009

2014

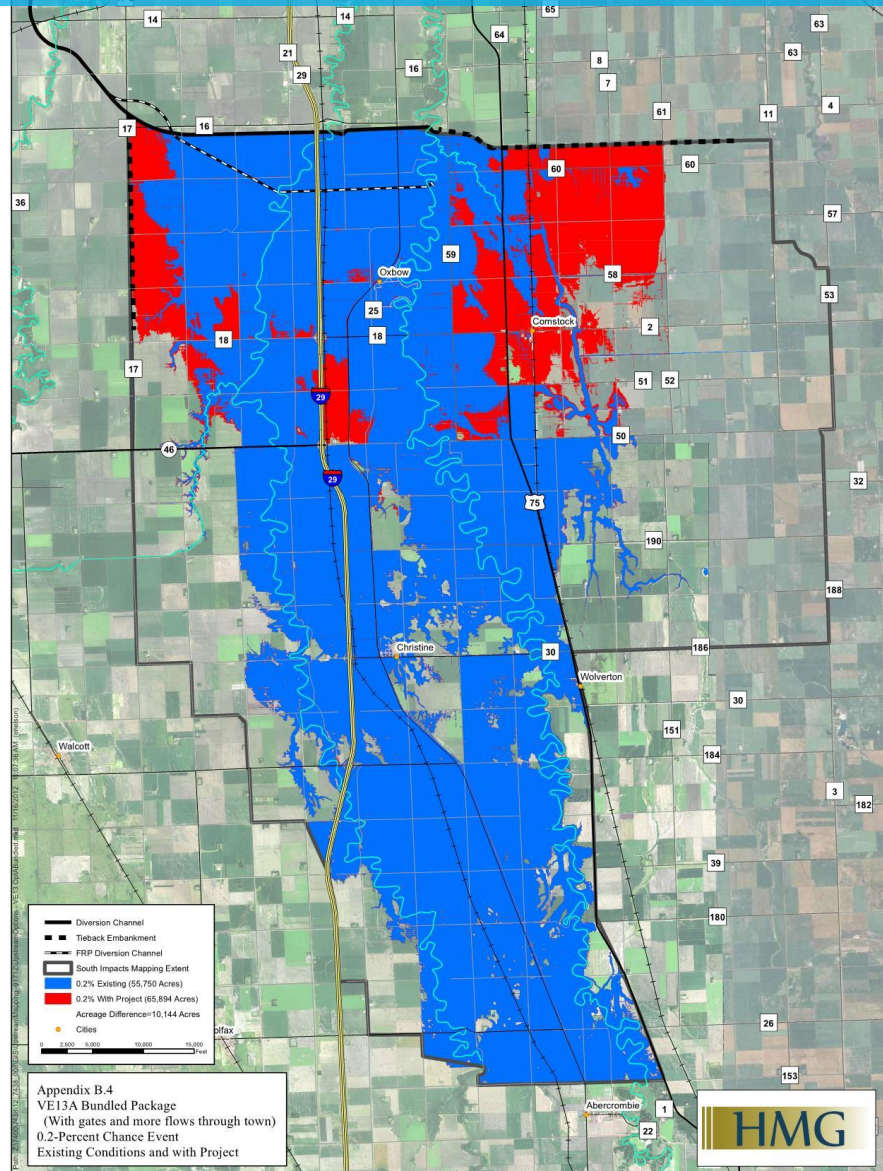


Upstream Impacts

100-Year



500-year





Post-Feasibility Revisions and Recommended Alternative

Continued Study after Federal Feasibility

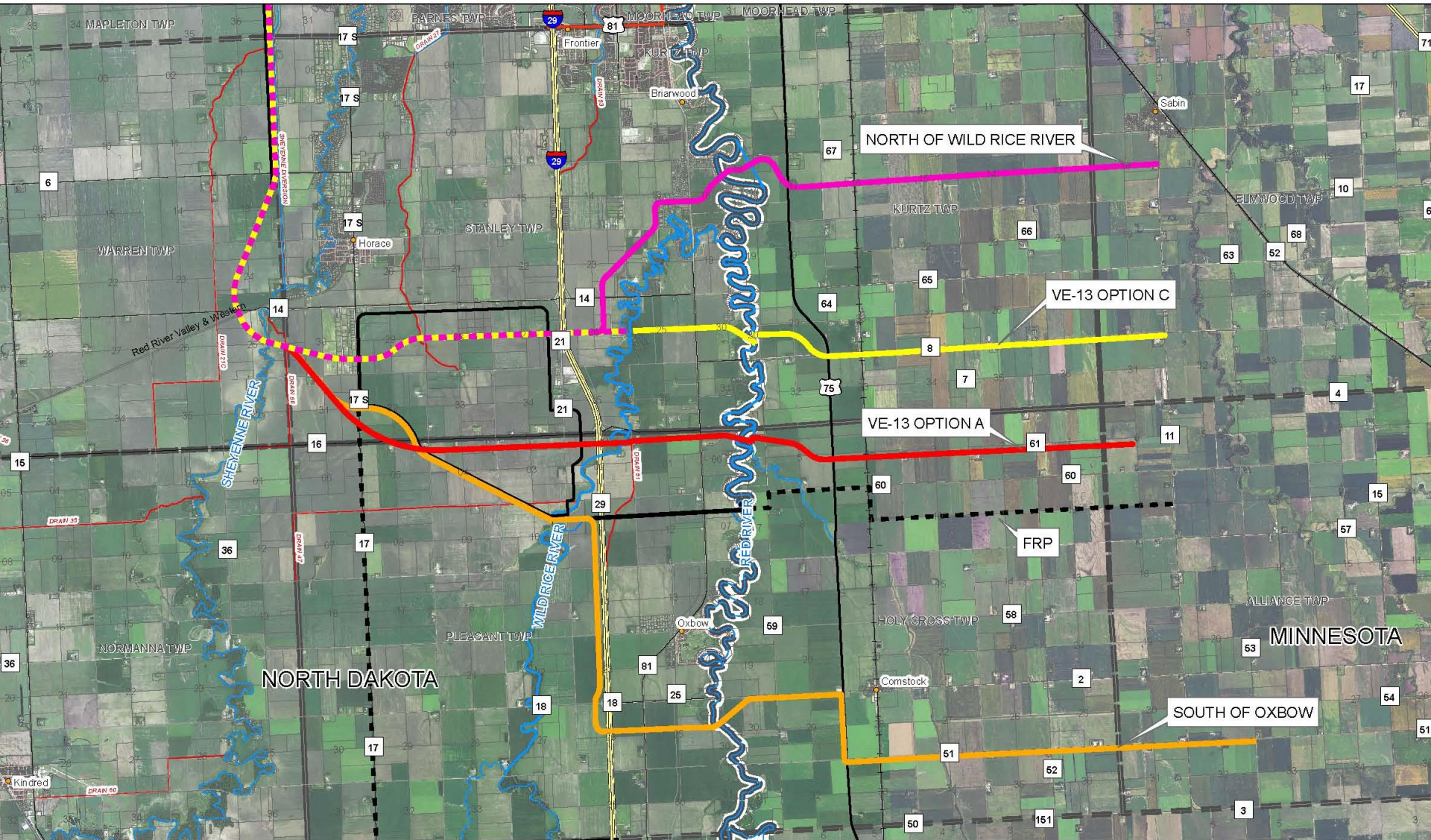
- September 2008: Fargo-Moorhead Metro Feasibility
- May 2010: Draft Feasibility Report and EIS
 - Refined designs, alignments, and features of several diversion channel alternatives
 - Completed cost estimates for each alternative
- April 2011: Supplemental Draft Feasibility Report and EIS released
 - Several concepts to minimize downstream impacts of a North Dakota diversion
 - Minimized downstream impacts
 - Induced upstream impacts (defined)
- July 2011: Final Feasibility Report and EIS released
 - Considered all comments received
 - Revisions made to incorporate additional analyses and data, and to address comments
- June 2012 Supplemental Environmental Assessment
 - Addressed alignment changes and design modifications
 - Public Comment period ended on July 15, 2013

Post-Feasibility Studies

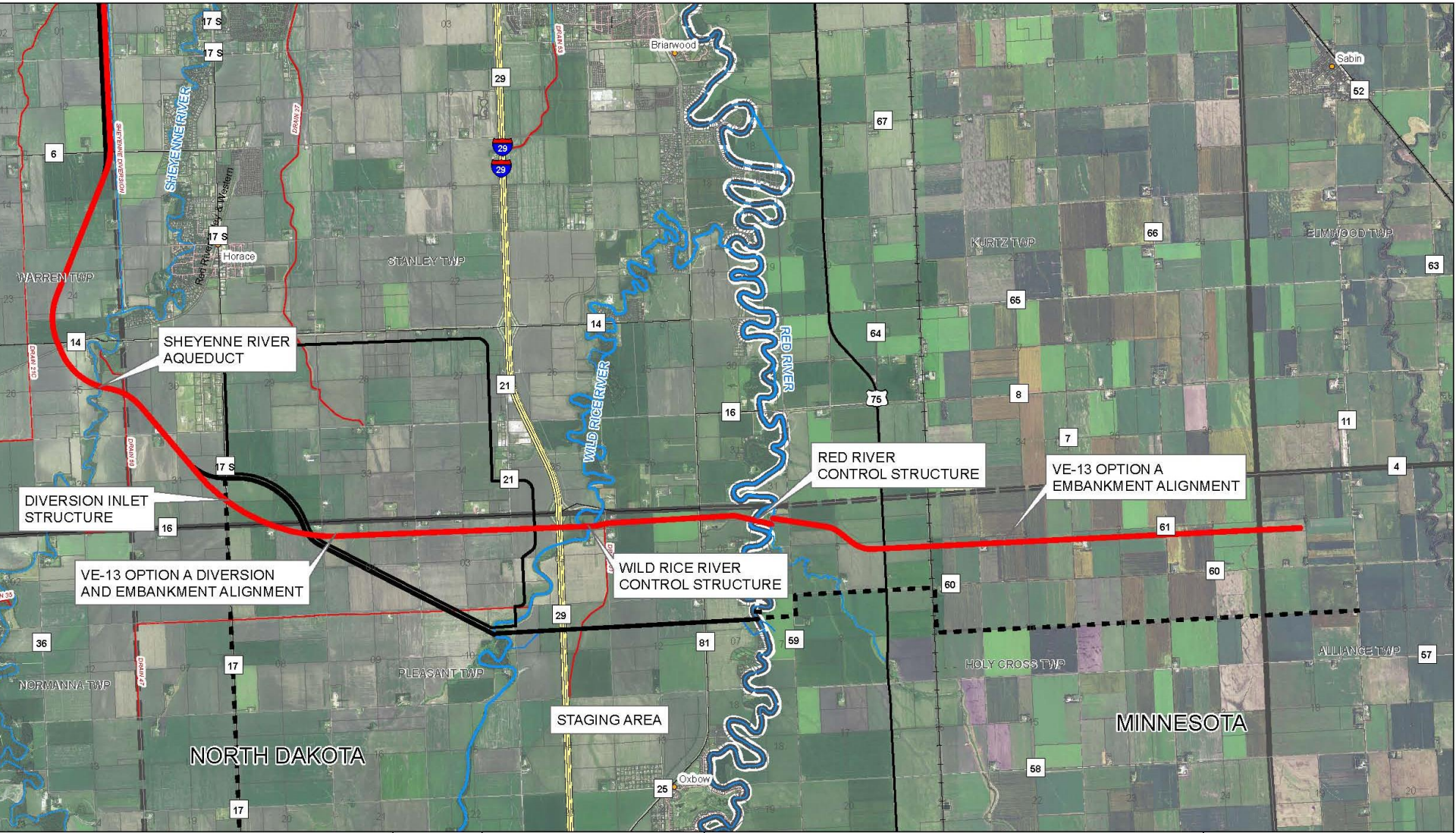
Value Engineering (VE Studies) and Technical Team Discussions

- *Southern Alignment Evaluation*
- *More Flow Through Town/In-Town Levees*
- *Diversion Inlet Evaluation (Weir vs. Gates)*
- *Oxbow/Hickson/Bakke Levee*
- *Channel Realignment*

Southern Alignment Evaluation

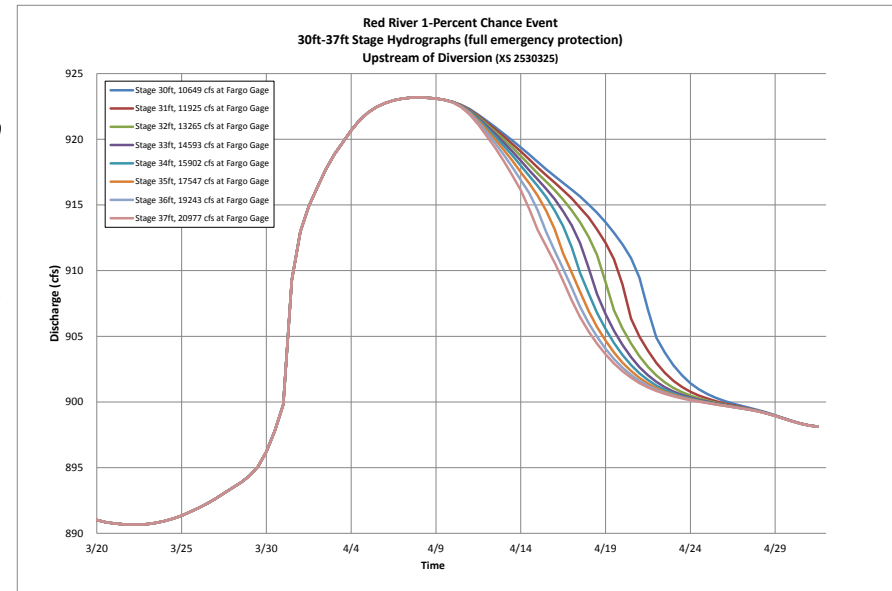


Post-Feasibility - Recommended Alternative



More Flow Through Town/In Town Levees

- Purpose:
 - *Reduced frequency and duration of project operation*
 - *Eliminates need for Fish Passage on Red and Wild Rice River structures*
 - *Reduces environmental impacts of project – (connectivity and geomorphology)*
 - *Significantly reduces the probability of summer operation*



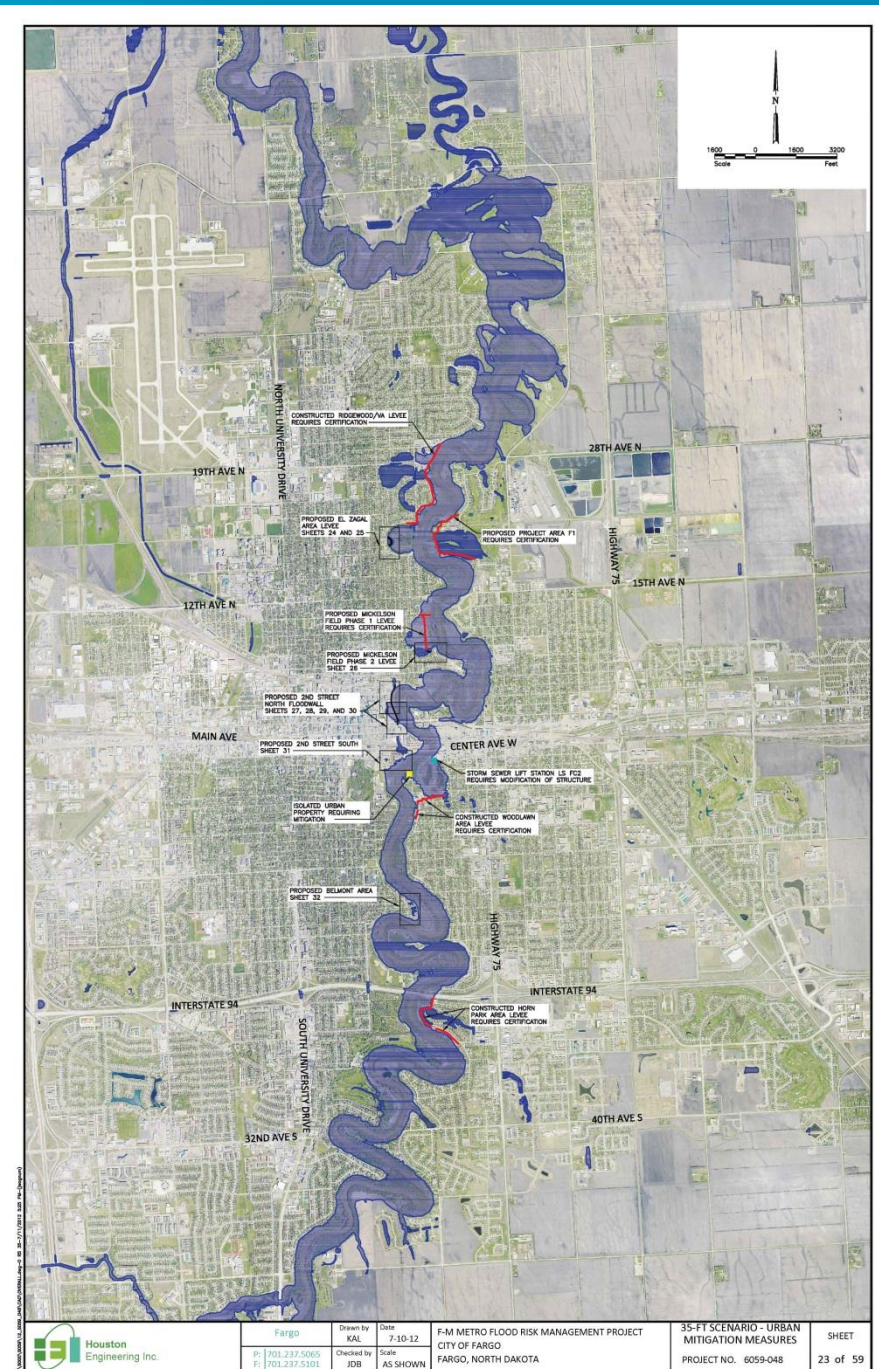
More Flow Through Town/In Town Levees

Residual Peak 100-yr Flood Stage, Discharge, and Approximate Existing Frequency Conditions

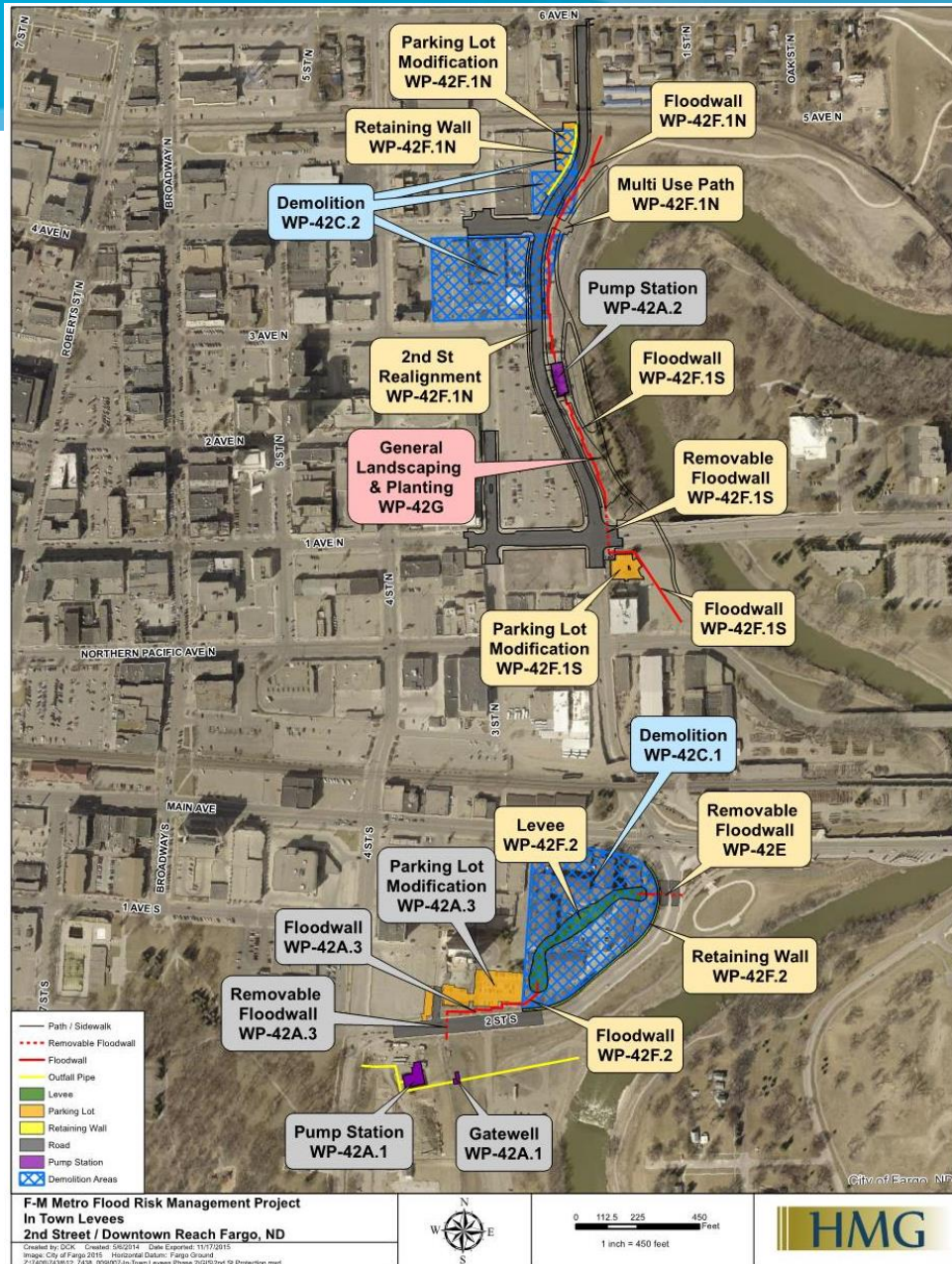
Residual 100-yr Flood Stage	Residual 100-yr Peak Discharge (cfs)	Approximate Existing Condition Frequency (yr)
RS30	10,700	3.6
RS31	11,900	4.8
RS32	13,300	6.0
RS33	14,600	7.1
RS34	15,900	8.4
RS35	17,500	10.2
RS36	19,200	11.4
RS37	21,000	12.9

35 foot Mitigation Measures

- Existing Levee Certifications (5)
- El Zagal Area Protection
- Mickelson Area Protection
- 2nd St. Protection
- Belmont Area Protection
- Individual Property Mitigation/Acquisitions
- Transportation mitigation measures (rural).



In-Town Levees - 2nd St./Downtown Protection



In-Town Levees - 2nd Street South 2009 Flood Fight



2009 Flood

River Crest of 40.8'

Temporary levee required on 2nd Street South at a river stage of 30-feet.

Due to stability concerns temporary levee can't be built until river reaches a river stage of 24-feet.

Top of temporary levee constructed to river stage of 44-feet.

Levee required over 13,000 CY of clay

Emergency measures placed on top of existing levee for freeboard.

Since 2009 levee has been raised on average 2.0-feet.

In-Town Levees - 2nd Street South



Pump Station, Gatewell/Outfall & Floodwall

Construction cost of \$17.8m – Substantial completion Fall 2016

Pumping capacity-100,000 gallons/minute (GPM)

Floodwall elevation of 906.20 ft. (River stage 39.5 ft + 5.5 ft)

Floodwall length of 350-feet

Requires excavation of existing levee to build the gatewell/outfall

Existing levee originally constructed by USACE in 1960

In-Town Levees - 2nd Street South



Levee, Floodwall, Outfall & Structure Demolition (2 projects)

Construction cost of \$2.6m – Substantial completion Fall 2016

Apartment complex acquisition & demolition– Approximately 200 residents relocated

Floodwall elevation of 906.20 ft. (River stage 39.5 ft + 5.5 ft)

Floodwall length of 90-feet

Levee length of 675-feet

In-Town Levees - 2nd Street North 2009 Flood Fight



2009 Flood

River Crest of 40.8'

Temporary levee required on 2nd Street North at a river stage of 30-feet.

Due to stability concerns temporary levee can't be built until river reaches a river stage of 24-feet.

Top of temporary levee constructed to river stage of 44-feet.

Levee required over 25,000 CY of clay

In-Town Levees - 2nd Street North – Pump Station



Pump Station, Outfall, Floodwall & Gatewell

Construction cost of \$8M – Substantially Completed

Pumping capacity- 75,000 gallons/minute (GPM)

Pump station is 33-feet deep

Elev. 906.20 ft. (River stage 39.5 ft + 5.5ft)

Floodwall length of 50-feet

In-Town Levees - 2nd Street North – NP Avenue to 3rd Avenue North



Floodwall, Underground Utilities & Road Reconstruction

Construction cost of \$16.6M – Substantial completion Fall 2016
2nd Street N relocated over 100-feet to the west
Elev. 906.20 ft. (River stage 39.5 ft + 5.5ft)
Floodwall length of 870-feet
Removable floodwall length of 160-feet
6'x6' box culvert under road for pump station operation

In-Town Levees - 2nd Street North – 3rd Avenue North to 6th Avenue North



Floodwall, Underground Utilities & Road Reconstruction

Construction cost of \$13.8M – Substantial completion Fall 2016

Acquisition & demolition of 3 commercial properties

2nd Street N relocated over 100-feet to the west

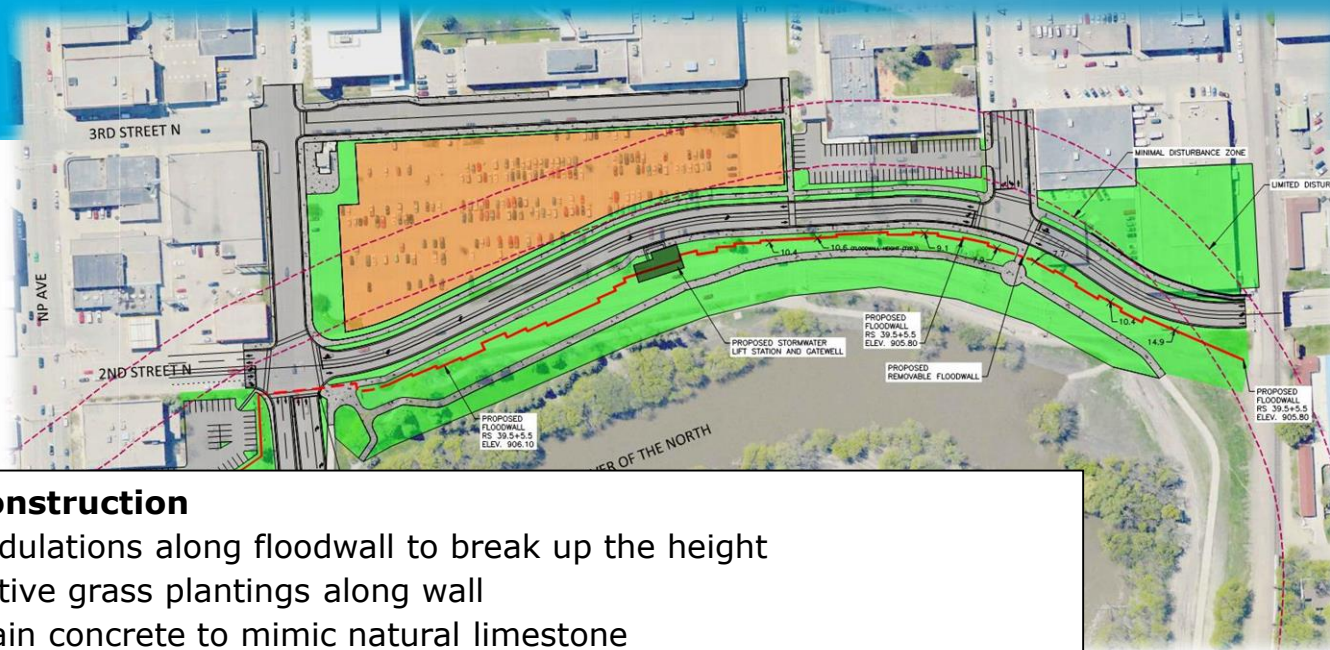
Elev. 906.20 ft. (River stage 39.5 ft + 5.5ft)

Floodwall length of 865-feet

Removable floodwall length of 40-feet

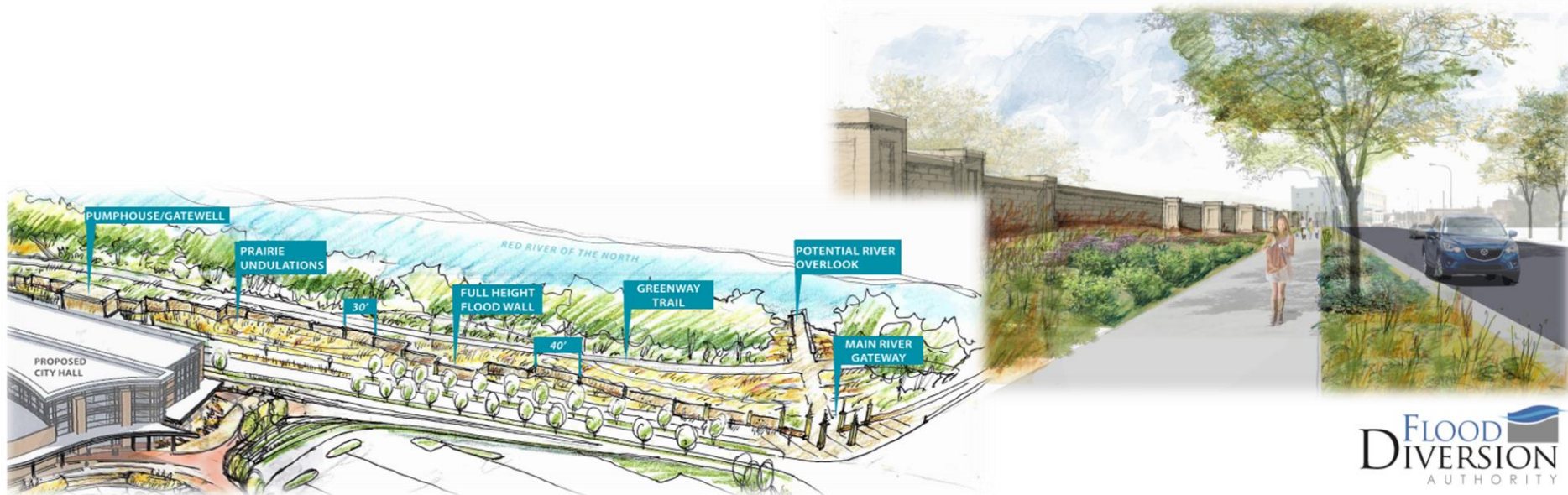
Retaining wall length of 280-feet

In-Town Levees - 2nd Street North – Aesthetics



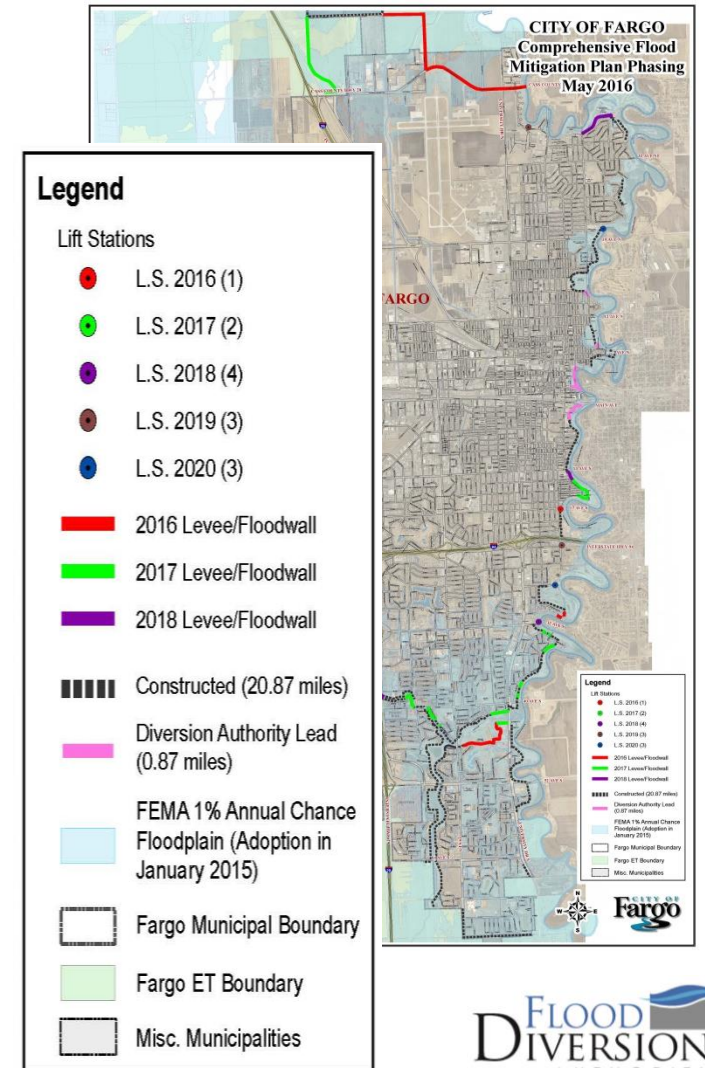
2017 Construction

- Undulations along floodwall to break up the height
- Native grass plantings along wall
- Stain concrete to mimic natural limestone



Diversion is Compatible with Fargo's other in-town flood Efforts

- 💧 Fargo has prioritized \$104M in additional in-town projects
- 💧 Focus is on hard to protect areas
- 💧 Avoids removal of homes to provide freeboard for certification
- 💧 Avoids projects that might be difficult to permit



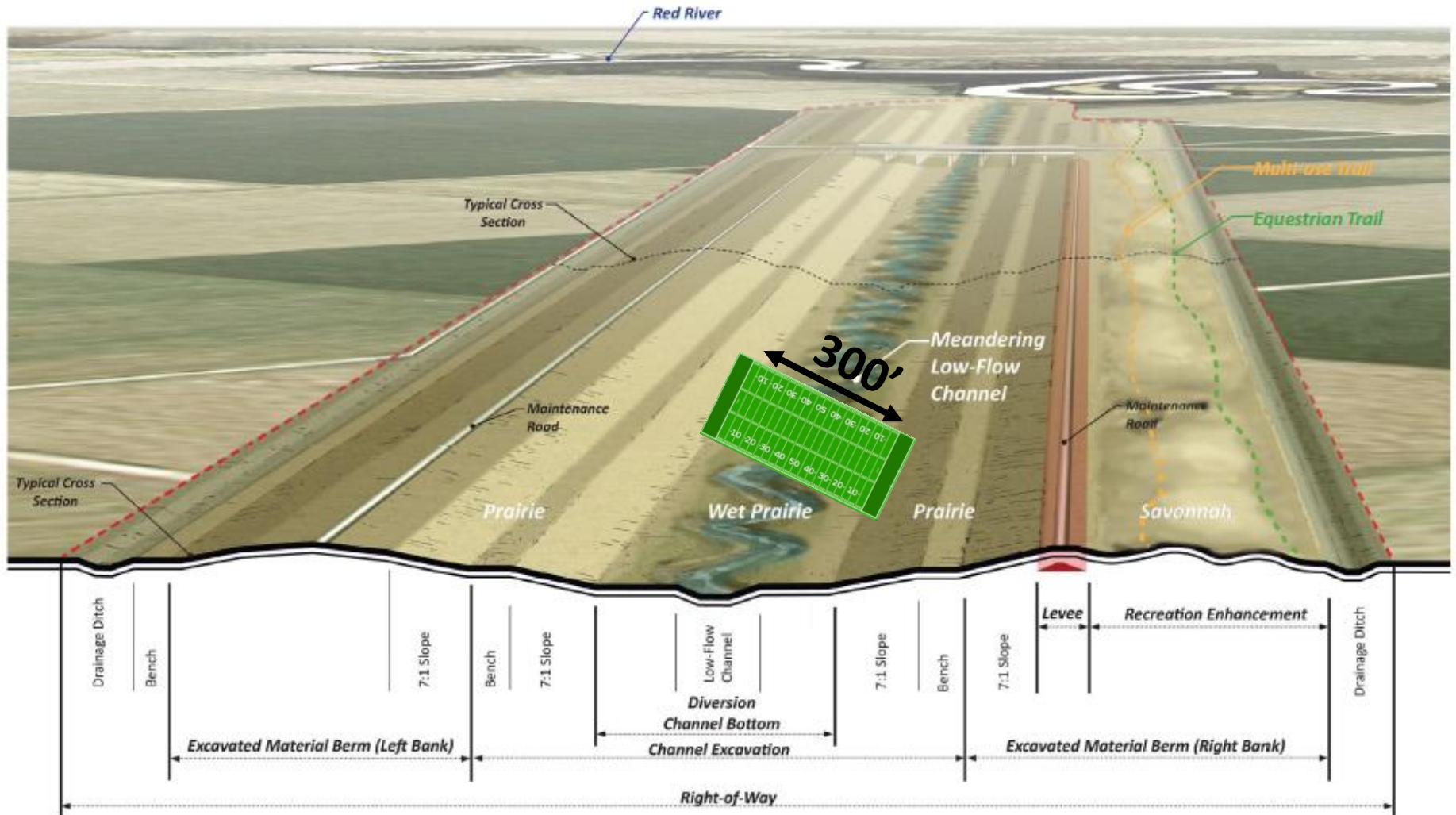
Studies Results in No Negative Impacts Downstream of Fargo

- 💧 Reduced original design's impacts by over 2-feet
 - 💧 Original downstream impacts would have reached to Canada
 - 💧 Impacts on an estimated 4,500 structures downstream of project based on pre-feasibility study information
- 💧 Downstream impacts were nearly eliminated through use of a staging area immediately upstream of the Project
- 💧 Minnesota diversion alternative had downstream impacts of 1', impacts would go to Canada



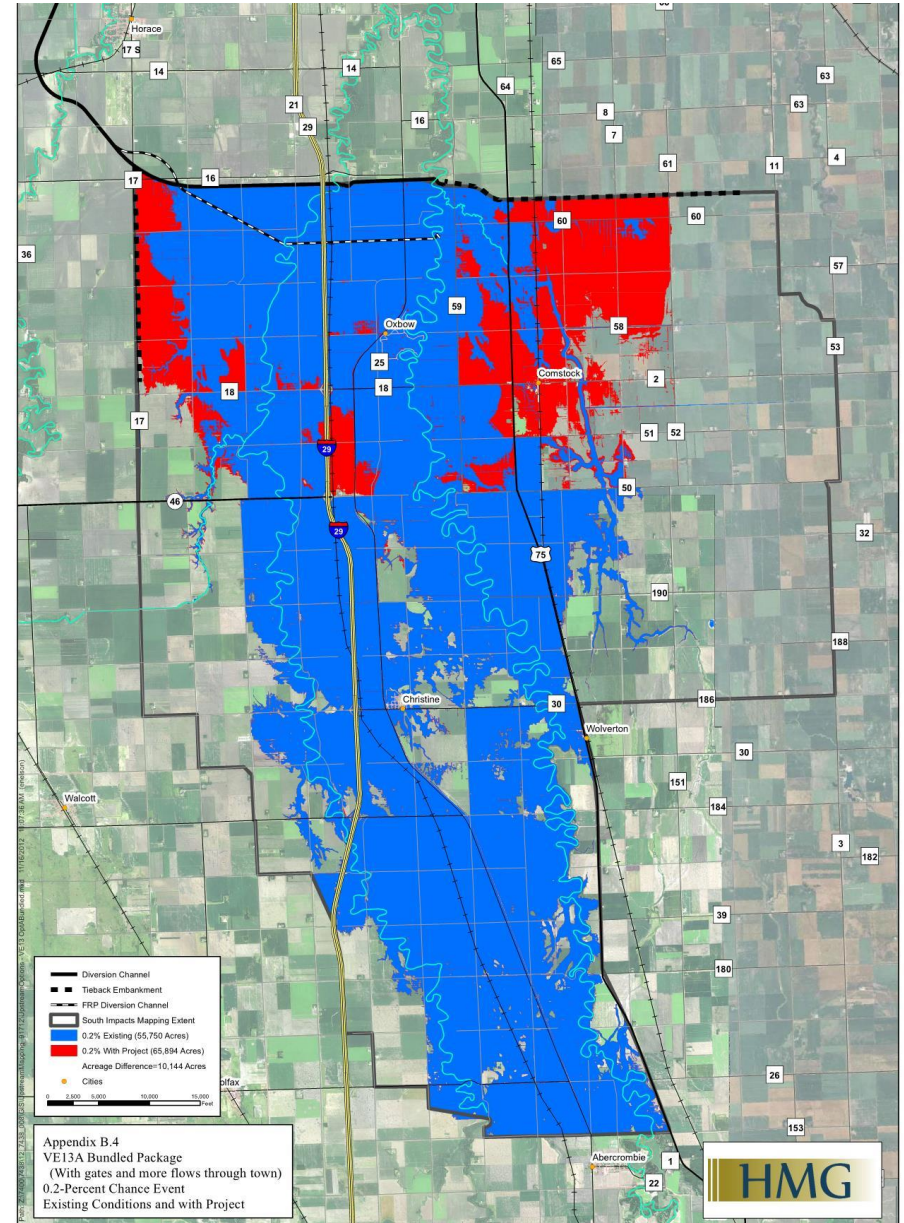
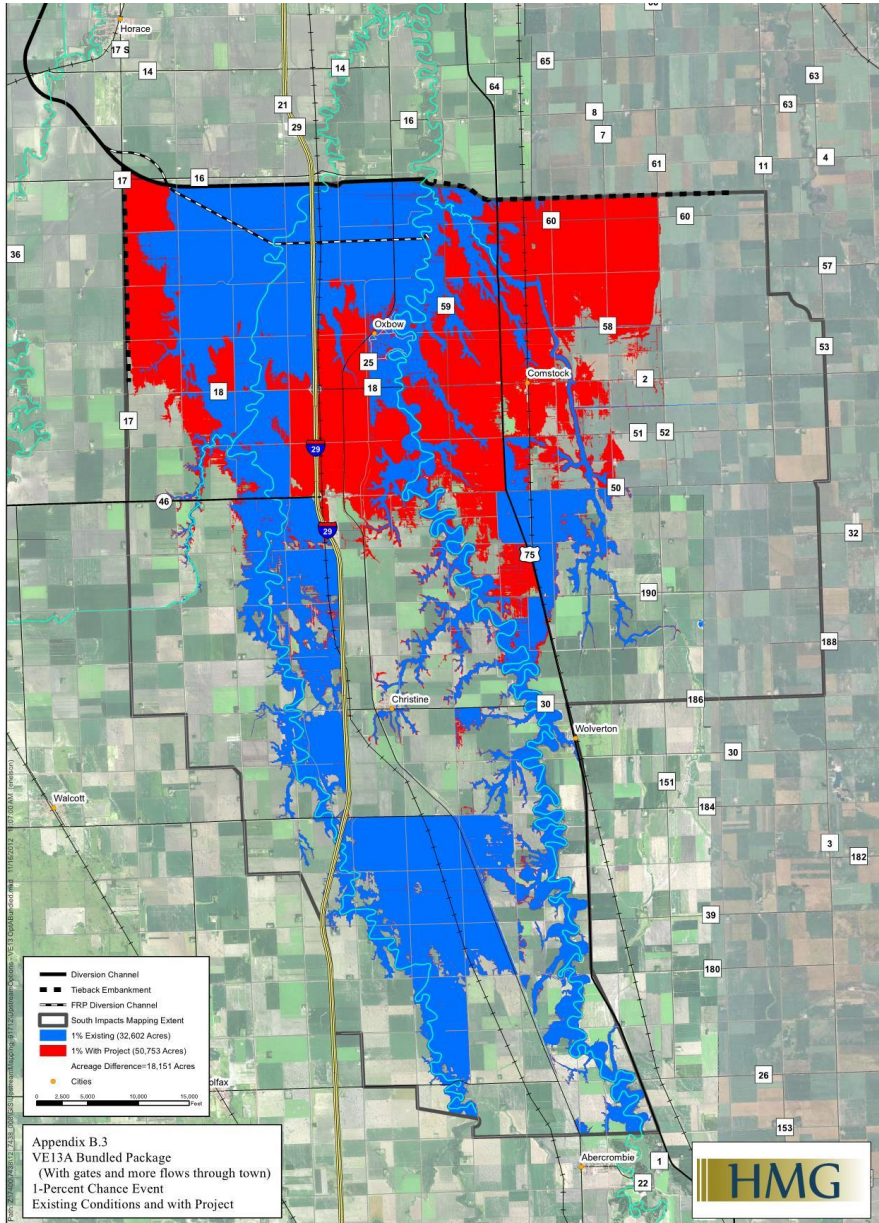
Diversion Project Design and Features

Diversion Channel Cross Section (Reach 1)



Total Width = 1,600 feet

Staging Area



Control Structures

Red River

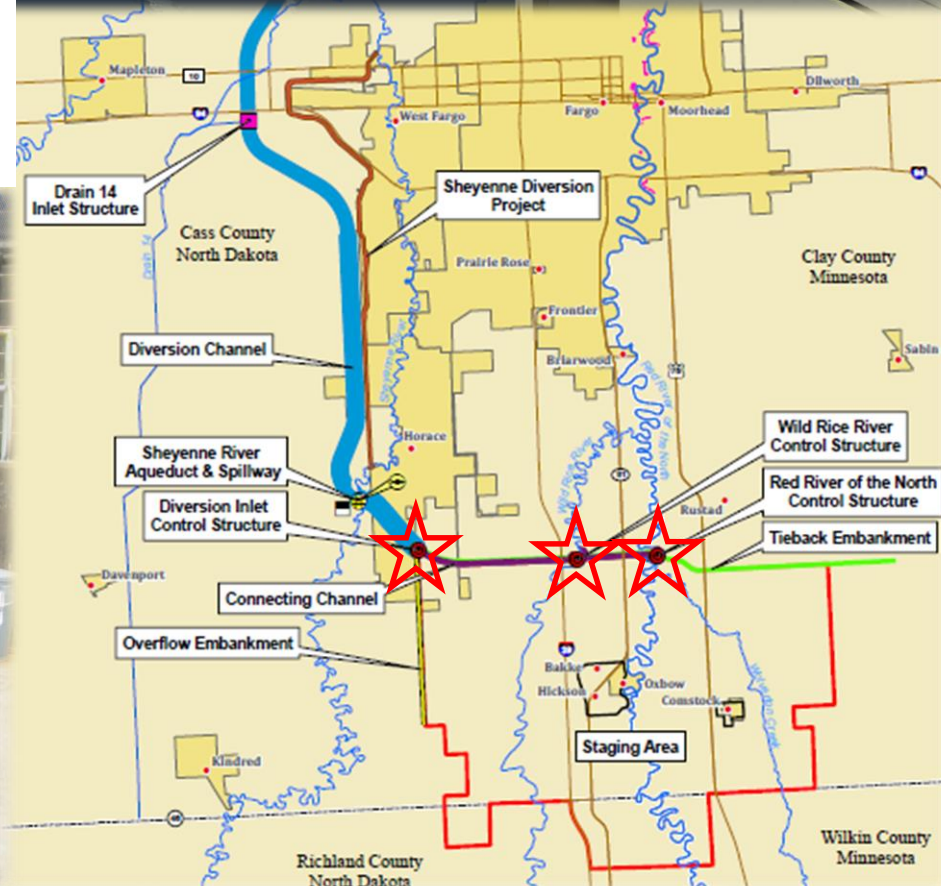
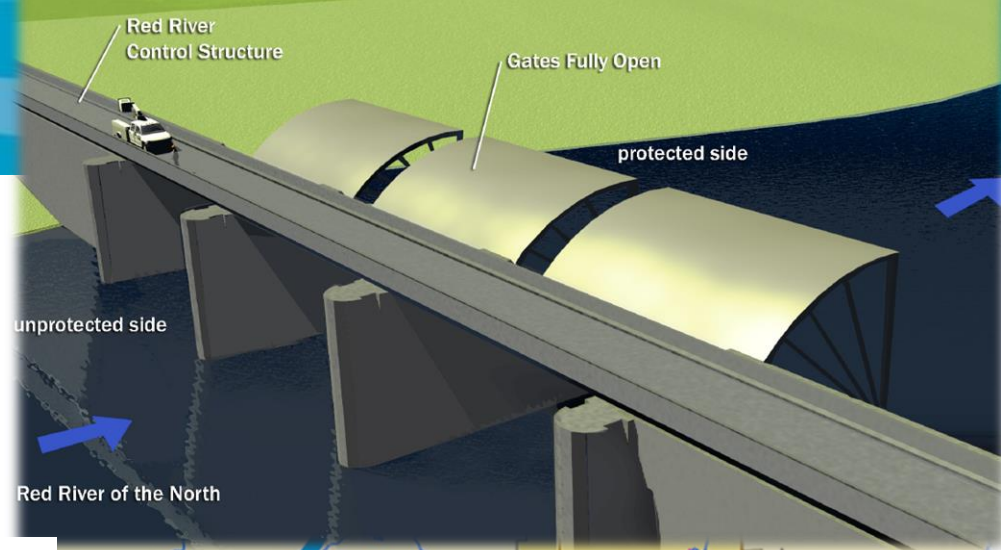
3 @ 50' W x 35' H

Wild Rice River

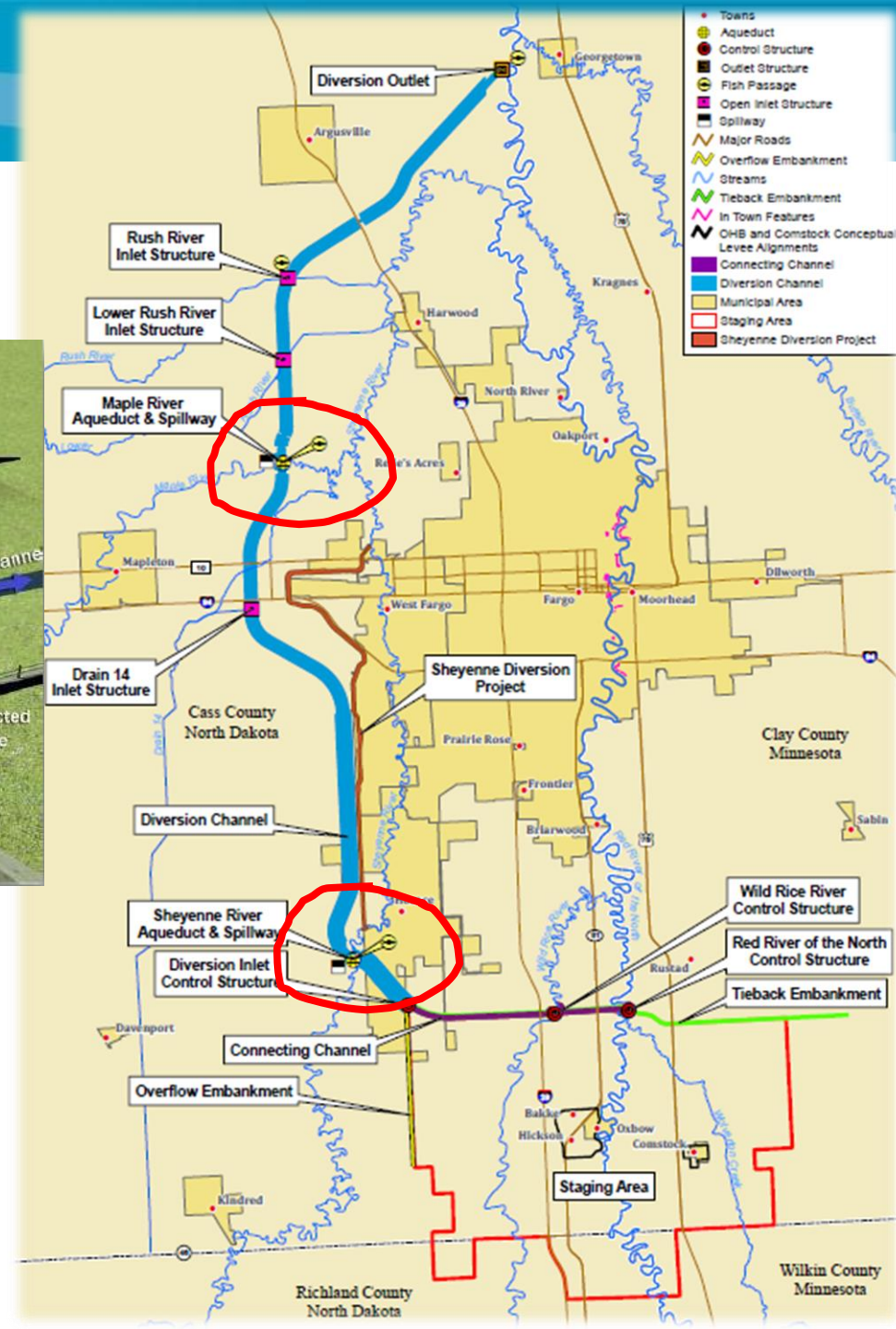
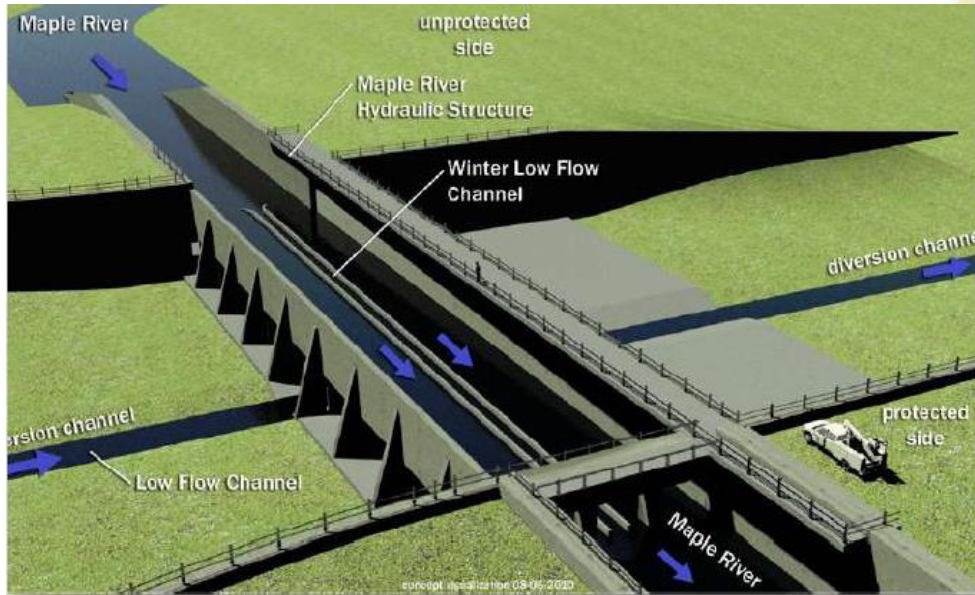
2 @ 30' W x 25' H

Diversion Inlet

3 @ 45' W x 25' H



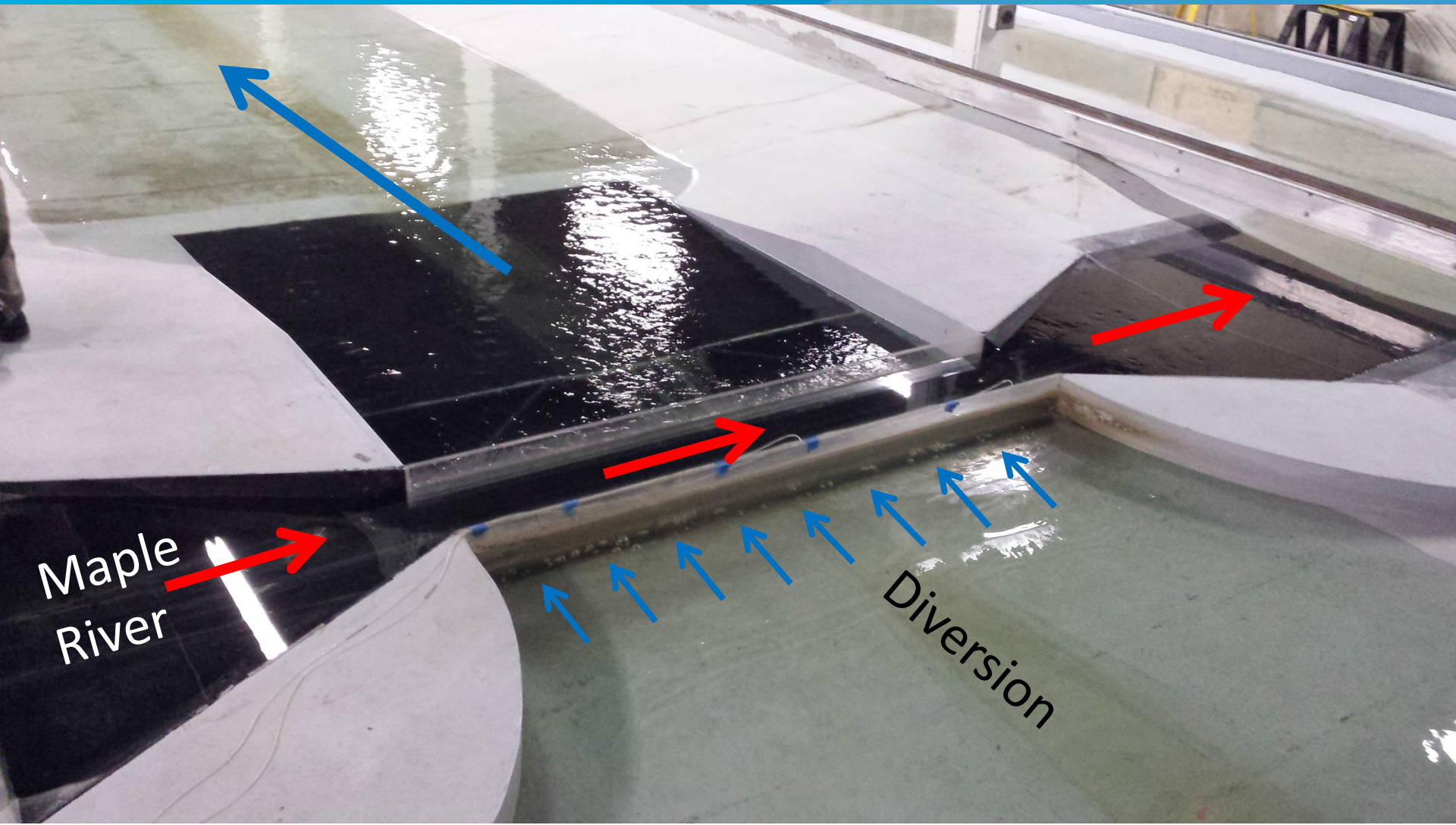
Aqueduct Structures





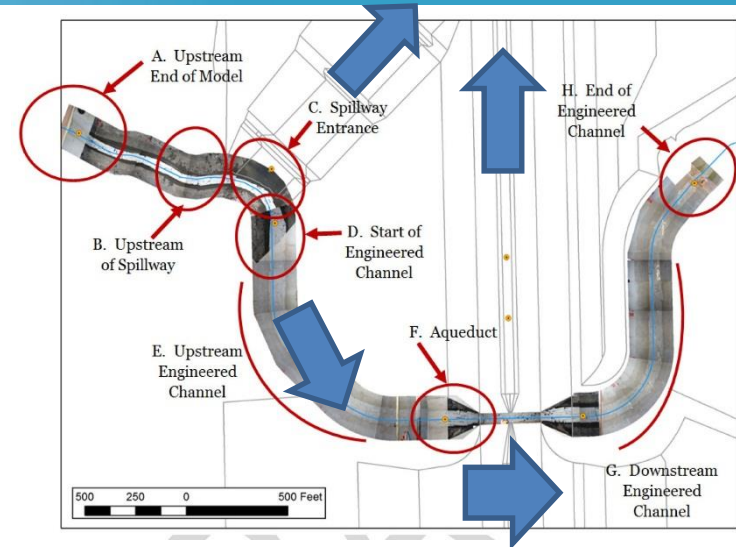
Conceptual Maple River Aqueduct Structure Illustration

Maple River Aqueduct Physical Model



Maple River Aqueduct – Flume Study

- Find configuration that:
 - Provides “fish-friendly” flow
 - Decreases aqueduct conveyance and increases flow over the spillway into diversion
- Scale: 1:15.
- Tested 3 configurations over a variety of flows
- Recommended configuration shown
- Coordinated with ND Game and Fish and MN DNR
- Final report end of November



Typical County Bridge Aesthetics



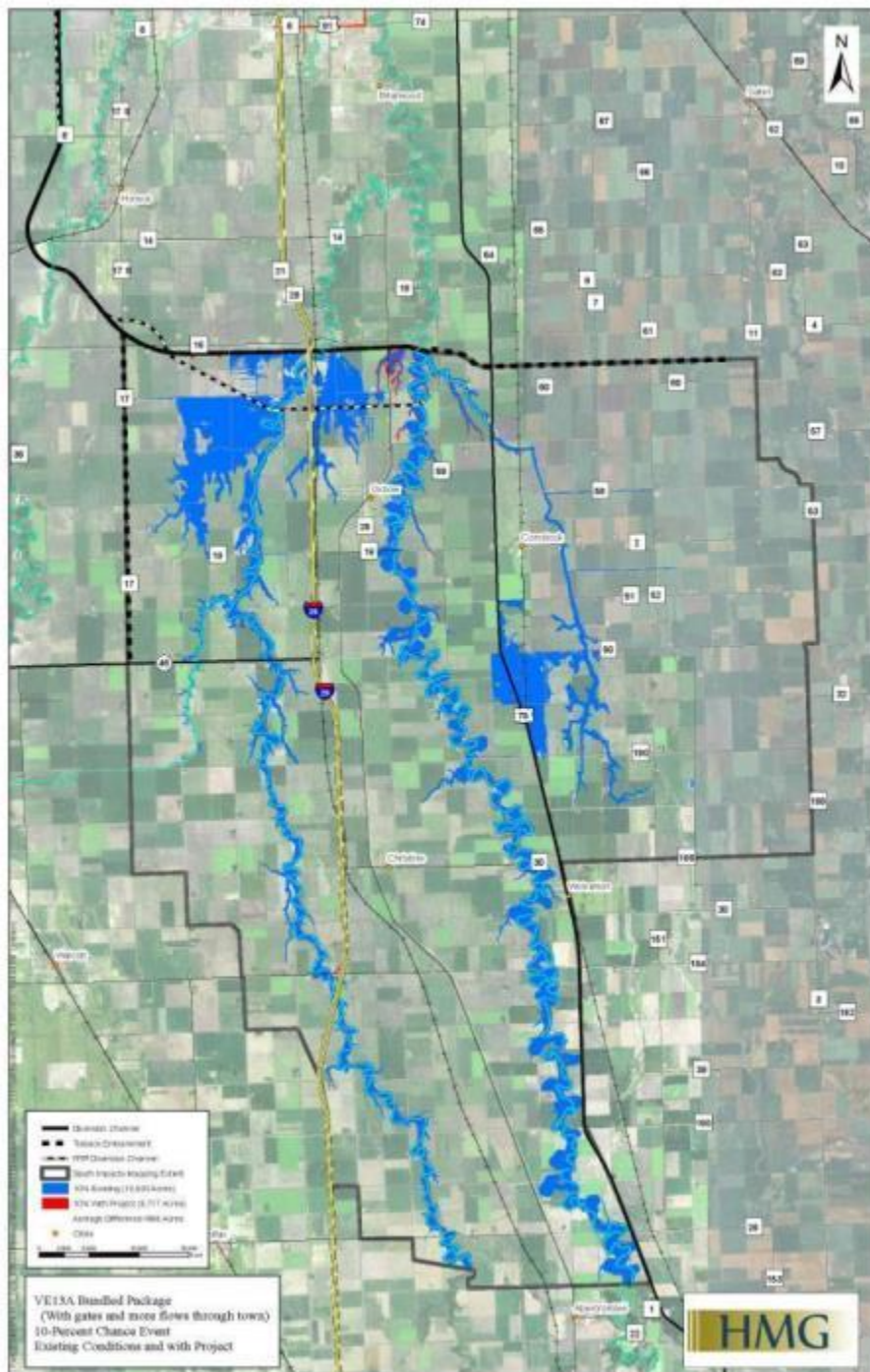
Diversion Inlet Control Structure



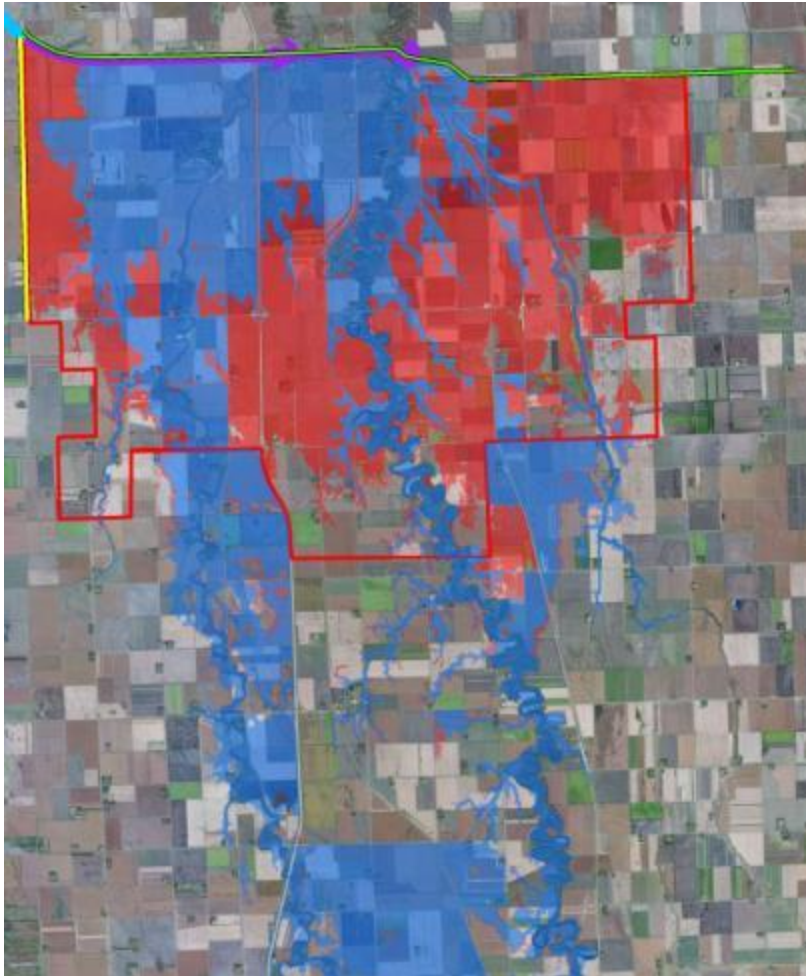
Diversion Project Operations

10-Year Flood Operation

- 💧 No Project Operation Under 10-Year Flood Event
- 💧 10-Year Flood Event = 35' at Fargo Gage
- 💧 Project would not have operated during a historic summer events (1975, 2005, 2007, 2009)



Staging (“Retention”) Area (100-year Event)



- 💧 Defined area
- 💧 Ability to mitigate for impacts
- 💧 Impacts to approximately 60 residences, with ring levees around Oxbow-Bakke-Hickson and Comstock
- 💧 Virtually eliminated all downstream impacts

Mitigation Efforts

Agricultural Mitigation

💧 Flowage Easements

- *A flowage easement is a one-time payment made to provide the legal ability to inundate property as part of the operation of the Project*

💧 Replacement Income (“Crop Insurance”)

- *NDSU’s Agribusiness Department has been contracted to study and quantify the impacts from the Project on farm revenue*
- *Additional study between ND State Water Commission and NDSU is underway*

NDSU's Summary Conclusions

- 💧 Combining hydrology with historical data revealed:
 - 85% chance that the Diversion will not operate in any given year
 - Effects of flooding will be over for a majority of lands approximately the same time regional planting starts.
- 💧 During a 25-yr or larger flood event, high probability (60% chance) of modest (\$1 to \$25/acre average within a storage area) revenue losses due to planting delays
- 💧 During a 25-yr or larger flood event, low probability (10% chance) of greater losses (\$25 to \$75 per acre)

Residential Mitigation

💧 Residence and Farmstead Mitigation

- Impacts on residences and farmsteads >1' require federal mitigation (approximately 100 homes)
- Additional mitigation <1' on a case-by-case basis

💧 Hardship Acquisitions

- 5 homes have been purchased at the request of their owners due to hardships (4 additional have been approved for acquisition)

💧 Voluntary Acquisitions

- Several farmland owners have approached the Diversion Authority with an interest in selling their land
- The Diversion Authority has purchased 2,000 acres of farmland from willing sellers who approached the Diversion Authority
- Voluntary home acquisitions in impacted area expected to begin in 2016

Cemetery Mitigation

- 💧 Corps of Engineers has released a detailed report on the cemeteries in the region.
- 💧 Corps requirements include acquisition of a flowage easement
- 💧 A local cemetery mitigation team has been formed with members from Upstream cemeteries and the Diversion Authority to discuss additional options

OHB Ring Levee

- Construction began in June, 2014
- Provides 196 properties with 500-year flood protection
- Removes real estate “limbo” status for residents
- Protects the tax base of the Kindred School District



Project Implementation - Public-Private Partnership

FM Metro Area Flood Protection Includes Multiple Delivery Models

💧 *City of Fargo*

- *Flood projects using traditional design-bid-build*

💧 *Diversions Authority*

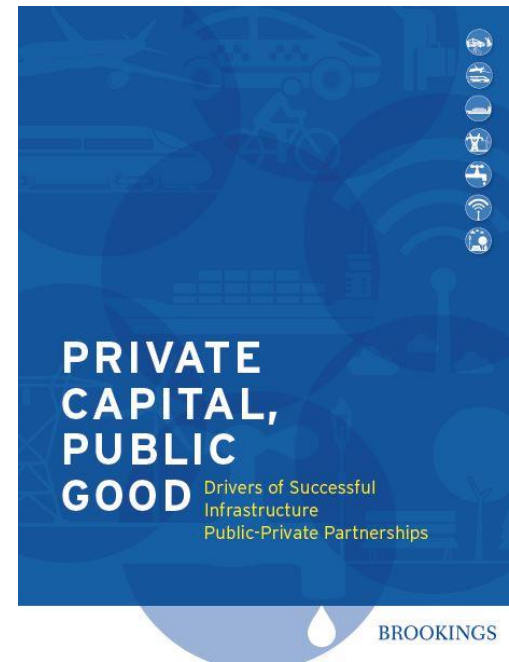
- *Diversions Channel & Associated Infrastructure (DCAI) using a Public Private Partnership (P3) delivery model*
- *Traditional design-bid-build for some construction*
 - *County Road 16/17 project (physical interface with P3)*
- *Other project elements, including land acquisition*

💧 *U.S. Army Corps*

- *Southern Embankment using traditional design-bid-build*

What is a Public Private Partnership (PPP)

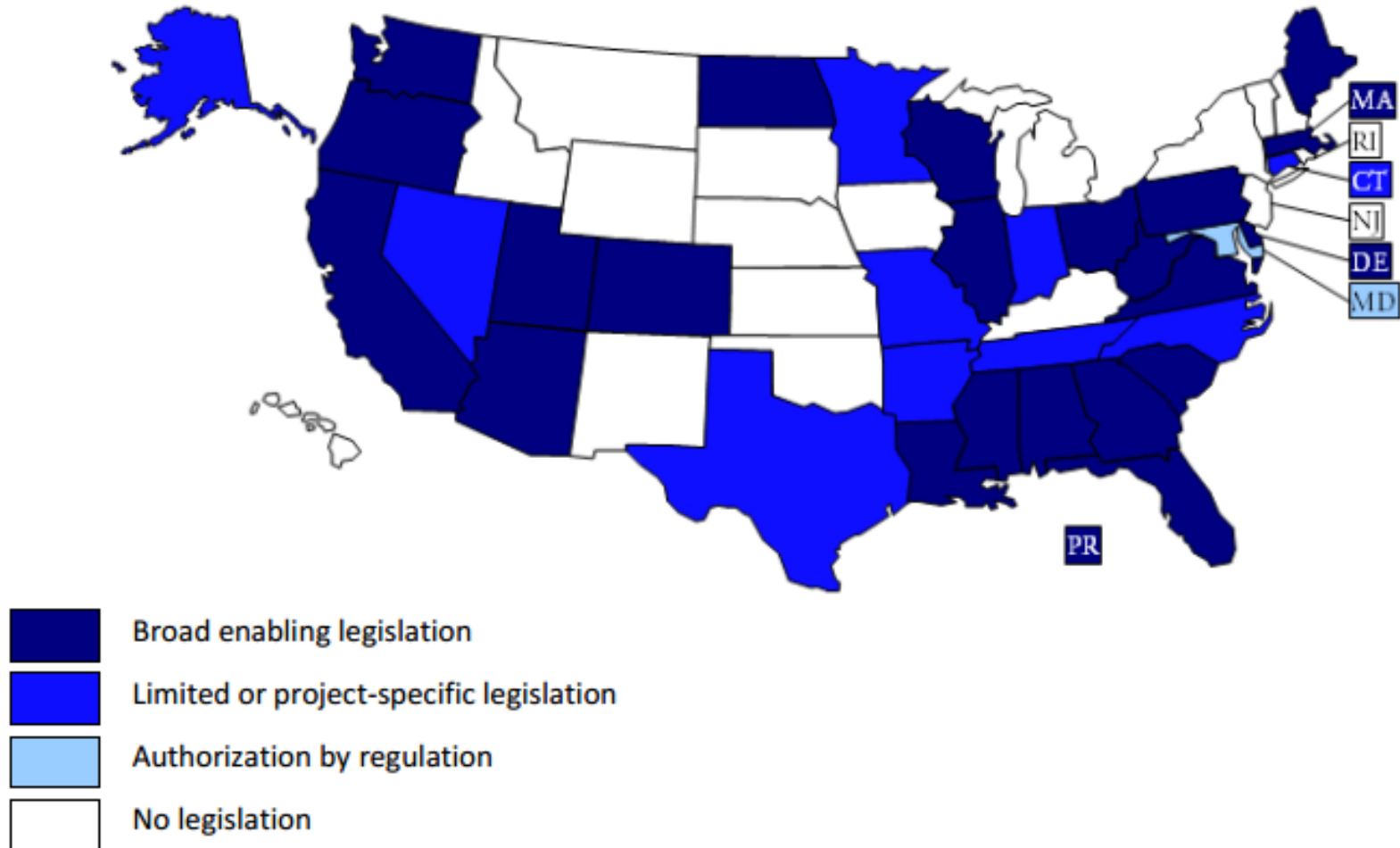
- 💧 A type of contract between the public and private sectors to deliver the design, construction, finance, operation, and maintenance (DBFOM) of the Diversion Channel and Associated Infrastructure
- 💧 PPP is not privatization – the Authority maintains ownership of the land and facilities



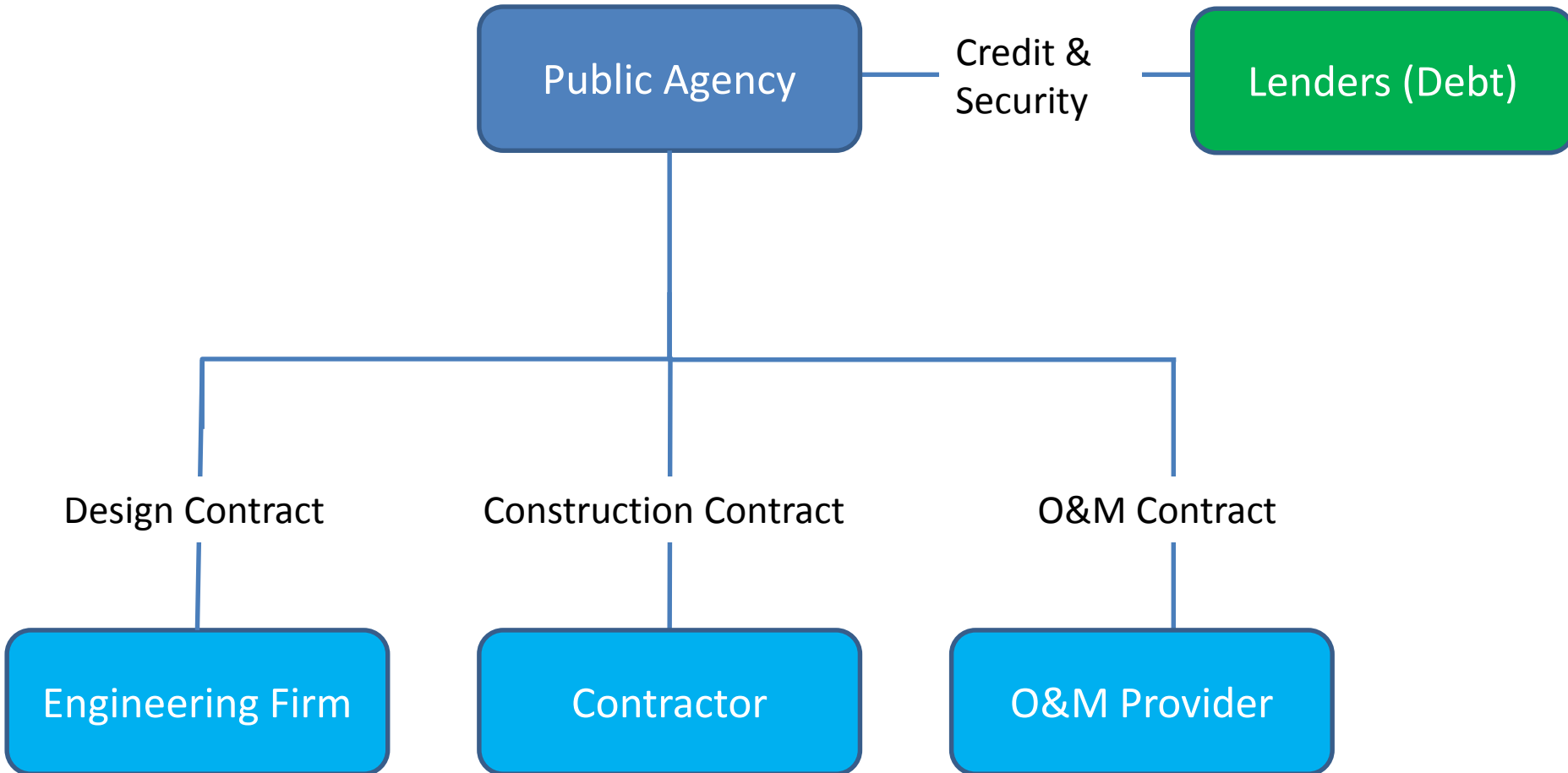
PPP is Growing in Popularity

States with Transportation PPP Enabling Legislation as of Jan. 24, 2013

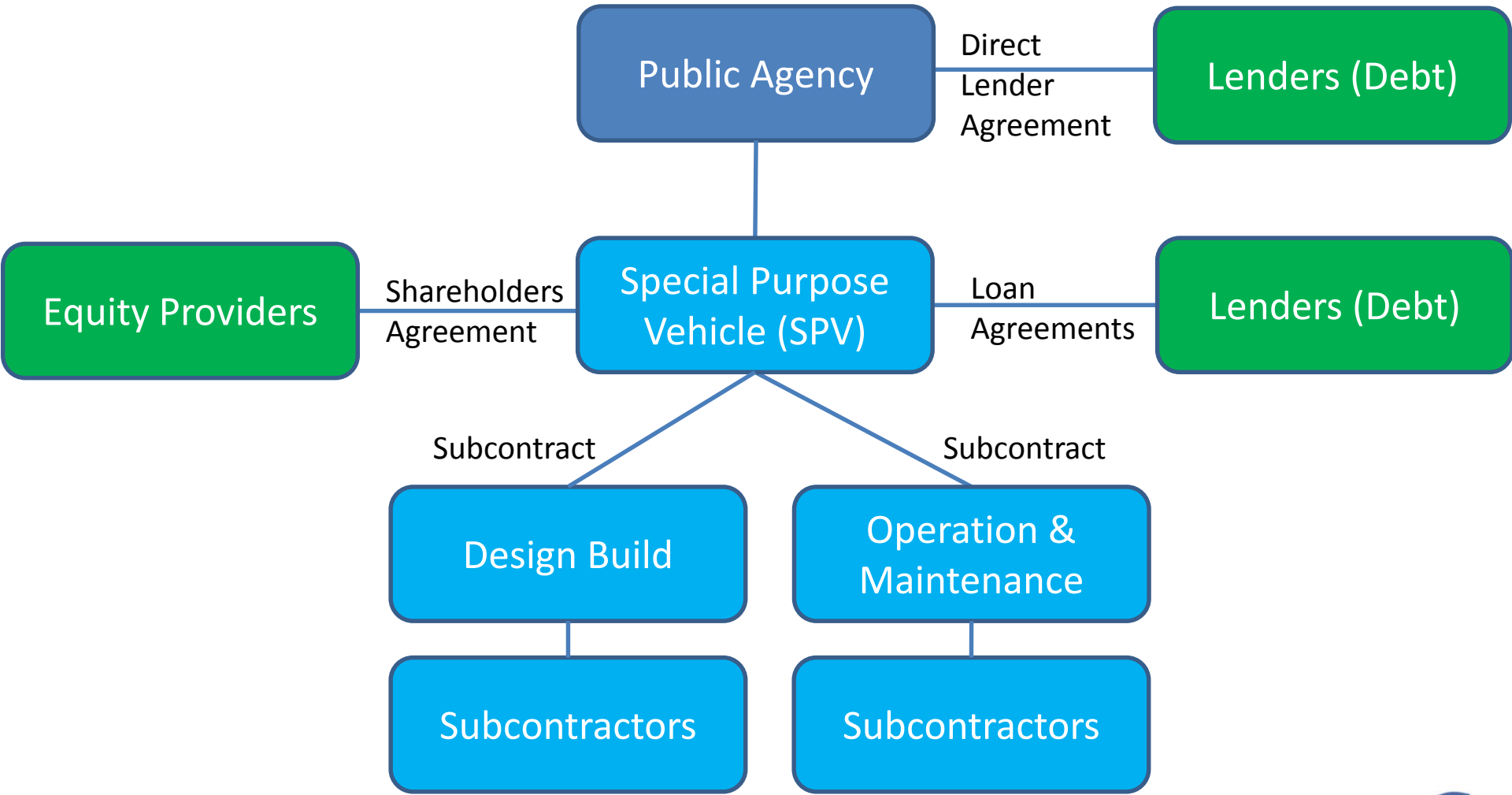
(Updated from page 15 of the 2010 NCSL PPP Toolkit)



Traditional Delivery Method (DBB)

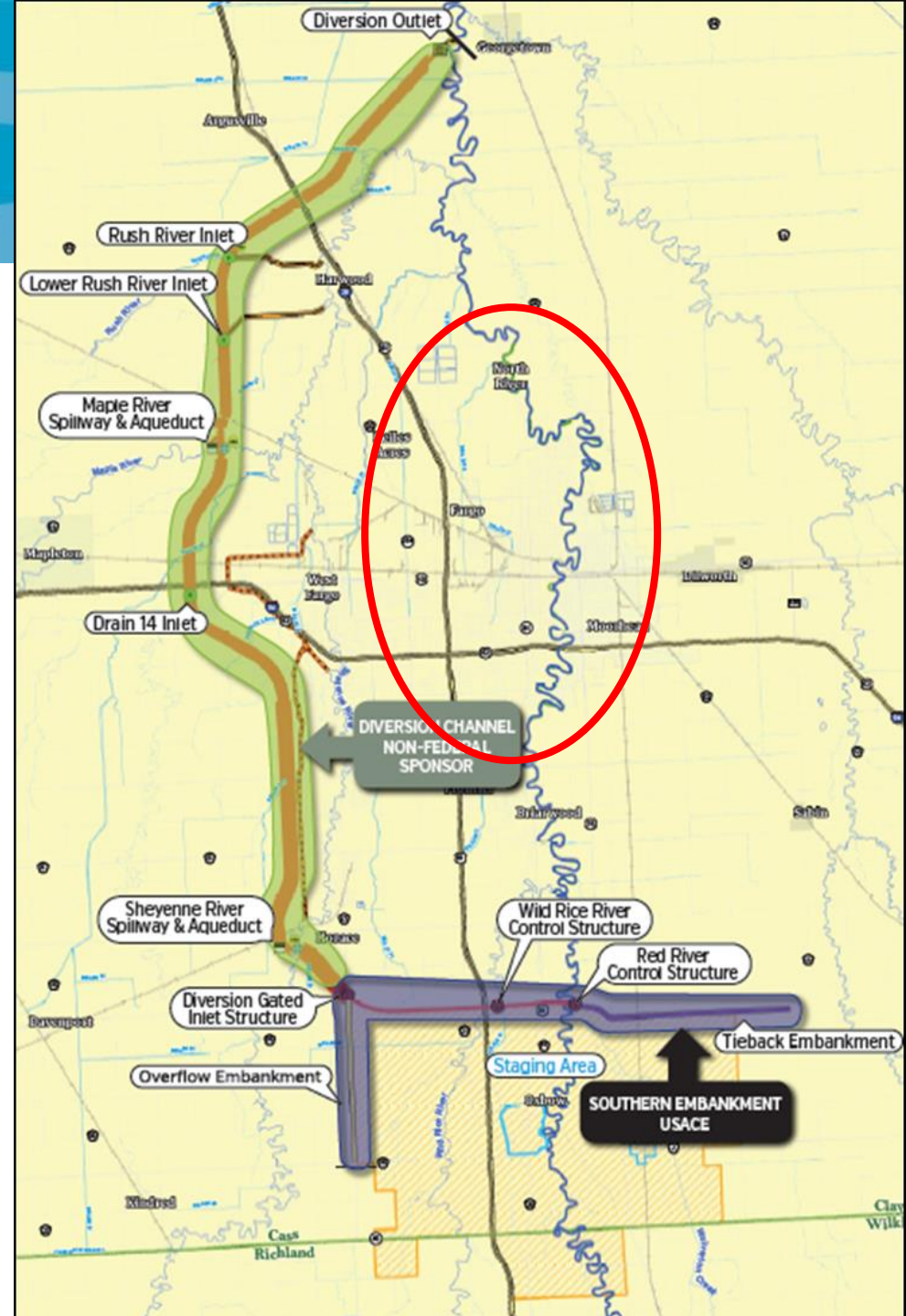


Typical PPP Model (DBFOM)



FM Metro Flood Protection Projects

- Projects Complementary to Diversion Authority Projects
 - City of Fargo
 - Mitigation Projects
 - County-wide Projects
- Included in the Financial Plan
- Not part of today's presentation



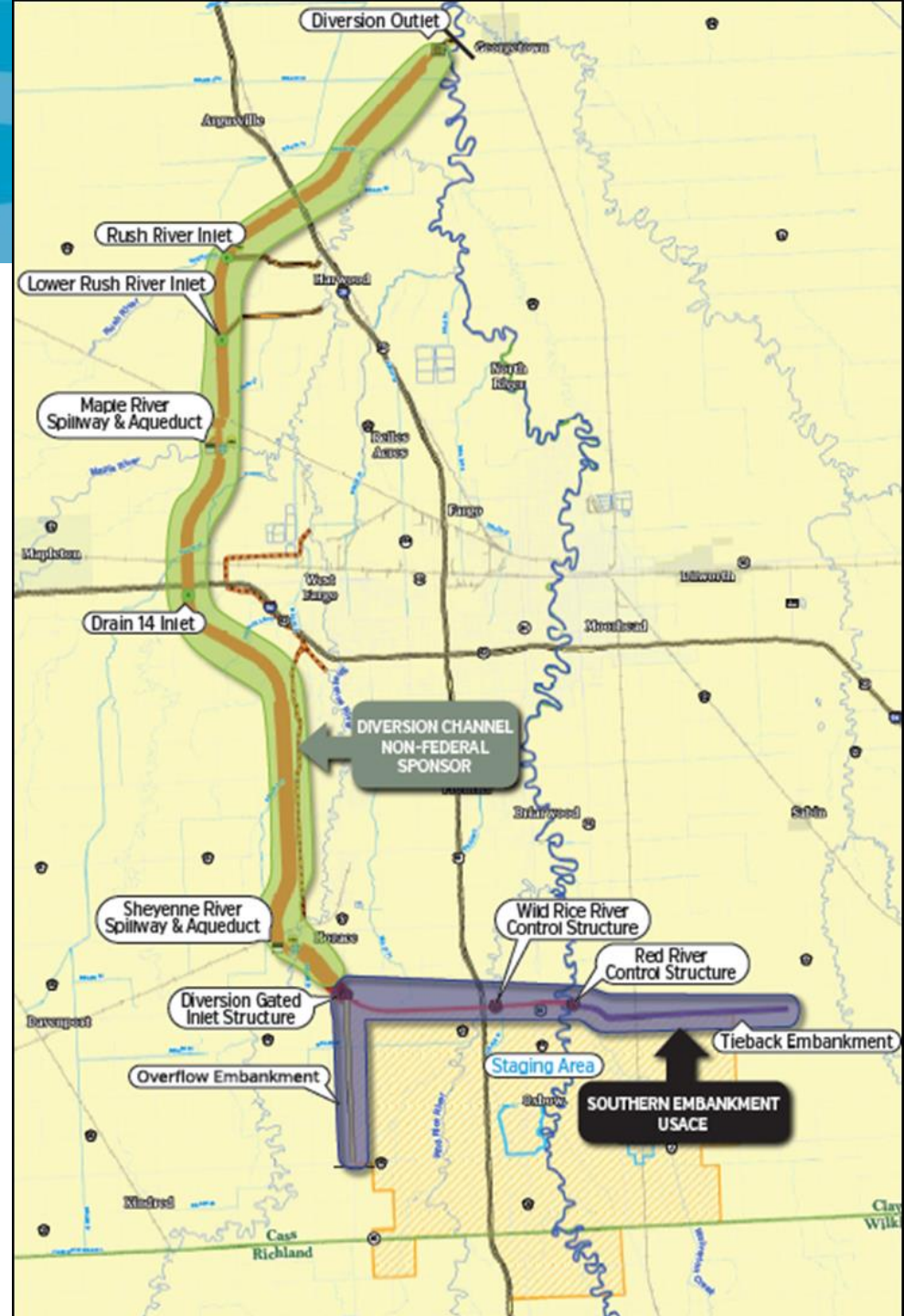
FM Metro Area Diversion Split Delivery

Non-Federal Sponsors

Diversion Channel
and Associated Infrastructure

USACE

Southern Embankment and
Associated Infrastructure, and
Mitigation



Why use PPP?

- 💧 Surest route to **Federal dollars**
- 💧 Authority gets schedule and **cost certainty**
- 💧 Delivers **best value** for the public's money
- 💧 Assigns risk to the party most able to manage the risk
- 💧 Provides **performance guarantees** and long-term warranties
- 💧 Promotes delivery **innovation**
- 💧 **Shortens schedule** – achieves flood risk reduction sooner
- 💧 Improves constructed **quality**

Benefits to Fargo and the Diversion Authority

- 💧 Provides cost and schedule certainty
- 💧 Fosters efficiency and innovation
- 💧 Stringent performance-based contract
- 💧 Known or “built-in” O&M costs
- 💧 Asset handed over to Owner in an agreed upon condition at end of concession term

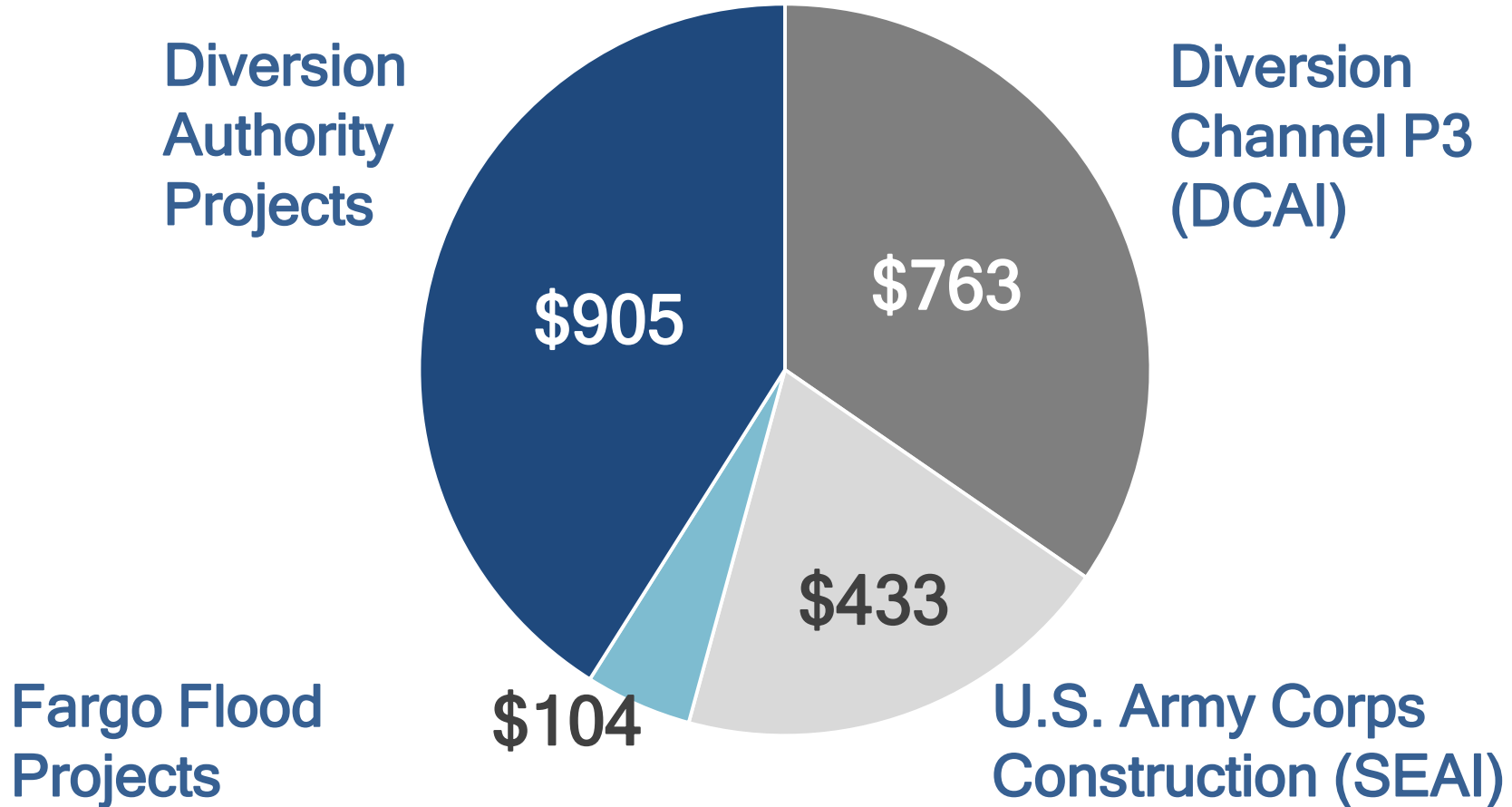
Diversion Financial Plan

Financial Plan Overview

Key features:

- *Multiple financing tools, including a mix of public and private financing to achieve a robust and cost-effective financial profile and risk transfer*
- *Long-term extension of existing sales taxes at current rates (subject to voter approval in November 2016)*
 - Sales Tax Revenues will be used towards long-term public debt, PAYGO during construction, and Availability Payments to the P3 Developer
- *Availability of special assessment mechanism through an Improvement District is a key credit enhancement*
 - No special assessments are anticipated to be required under the current plan of finance

Financial Plan Includes Diversion Authority and Fargo Flood Projects Totaling \$2.2B



(2015 \$ Million)

Sources of Funding and Financing

💧 Federal Funding

- *\$450 million (2015\$) to fund USACE portion of the Project, escalating to year-of-expenditure per PPA (committed)*

💧 State Funding

- *\$450 million from North Dakota for DA projects (committed)*
- *\$120 million from North Dakota for In-Town Projects (committed)*
- *\$43 million from Minnesota (to be requested)*

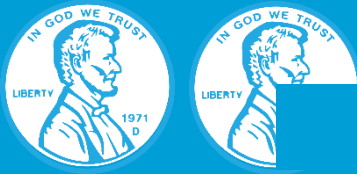
💧 Sales Tax Revenues

- *1¾ cent sales taxes allocated to FM Metro Flood Protection*
- *Covers all PAYGO and debt service requirements*

💧 Improvement District

- *Authorization of up to \$725 million in Improvement District assessments in the event of revenue shortfall*
- *Secures Improvement Bonds and Availability Payments*

Financial Plan Uses Existing City of Fargo and Cass County Sales Taxes

	City of Fargo						Cass Co.*
	1 ¢			½ ¢	½ ¢		½ ¢
Expiration Date	2028			2032	2028		2031
Funding Intent	¼ ¢ Water	¼ ¢ Waste Water	¼ ¢ Streets	¼ ¢ Flood Control	Infrastructure Flood Control	FM Diversion Project	FM Diversion Project
Sales Tax Funding for FM Metro Flood Protection						1 ¾ ¢	

*Accounts for other County-wide flood projects

P3 Payment Structure

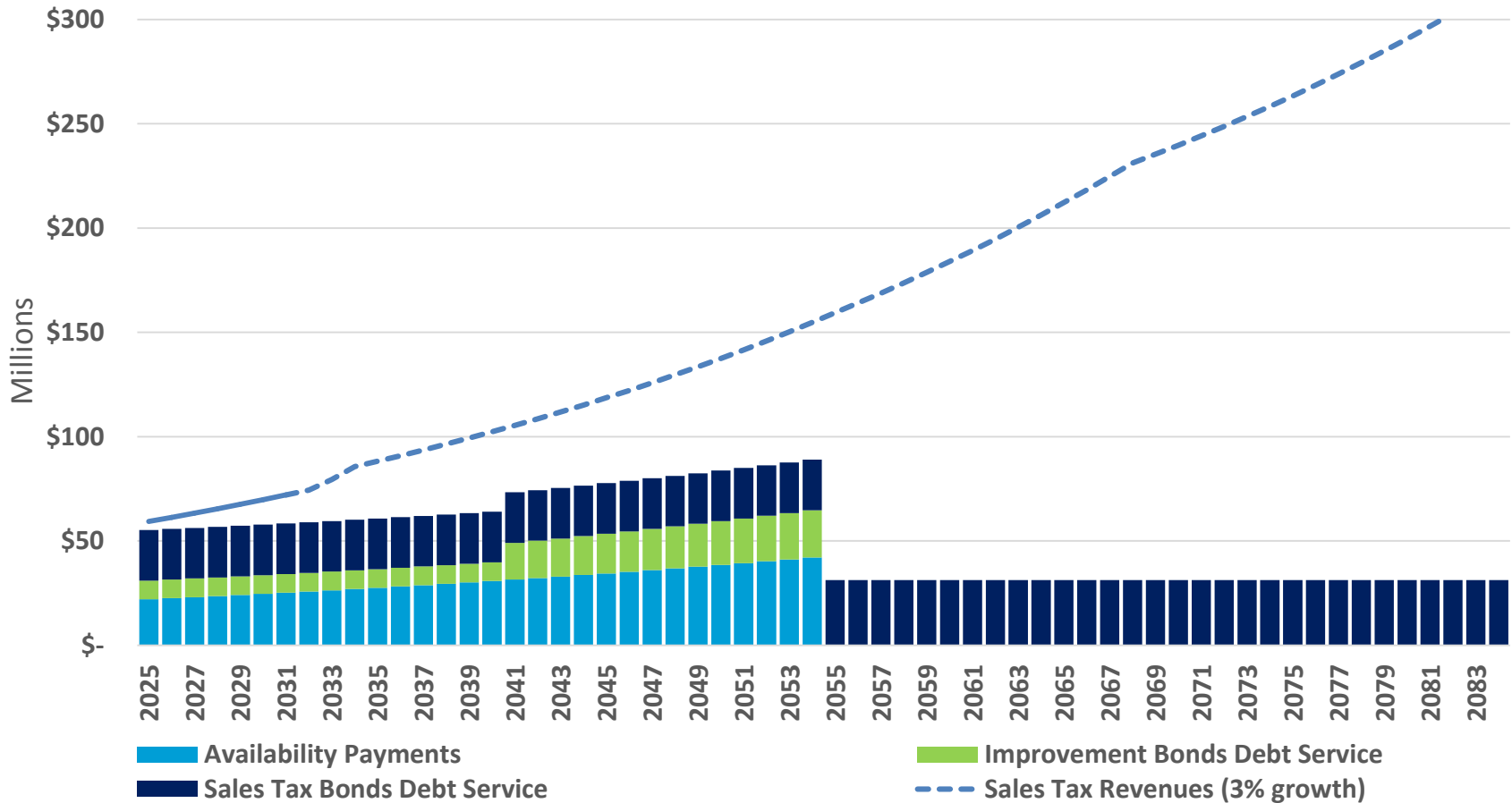
💧 Construction Milestone Payments

- *Milestone Payments expected to be funded from state appropriations, Sales Tax Bonds and Improvement Bonds*

💧 Availability Payments

- *Financial Plan anticipates long-term P3 financing (debt and equity) of approximately \$400 million*
- *Availability Payments commence upon substantial completion for term of Project Agreement (assumed to be 30 years in the Financial Plan), subject to deductions based upon performance*
- *Availability Payments secured by special assessments and expected to be funded from sales and use taxes*

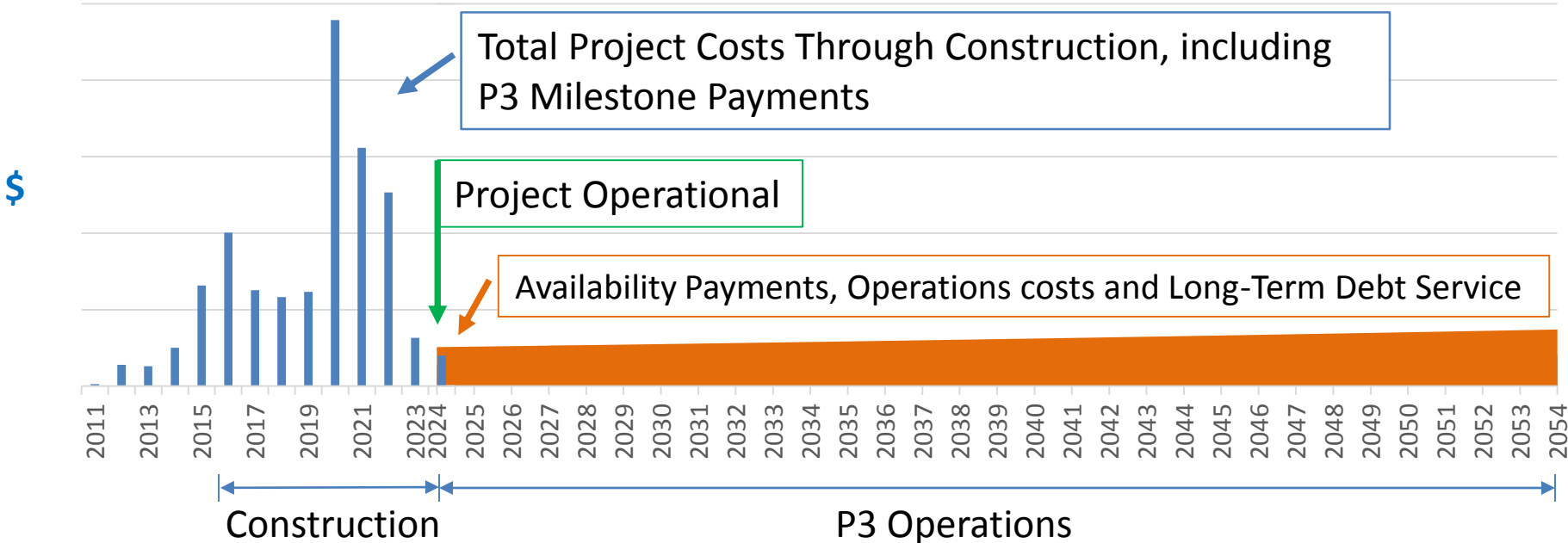
Long Term Financing – Illustrative Cashflows After Construction



Financial Plan will determine revenue to cover costs through construction, operations, and long term debt repayments

Funding Sources Through Construction:

- 💧 Grant Funds: Federal, State of ND, State of MN
- 💧 Sales Tax Revenues
- 💧 Public Financing (Short and Long-Term)
- 💧 P3 Financing (Debt & Equity)



More information at www.FMDiversion.com

F-M Area Diversion

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Corps Impressed with Diversion Project's Momentum



Congressional Delegation Works with Diversion Authority on Next Steps

Members and staff of the North Dakota and Minnesota Congressional delegations are working with the...



Diversion Authority Approves 2016 Budget



Bill Provides Authorization and Funding for Flood Protection Construction

About the FM Diversion



Questions?