

Local Entity Flood Protection

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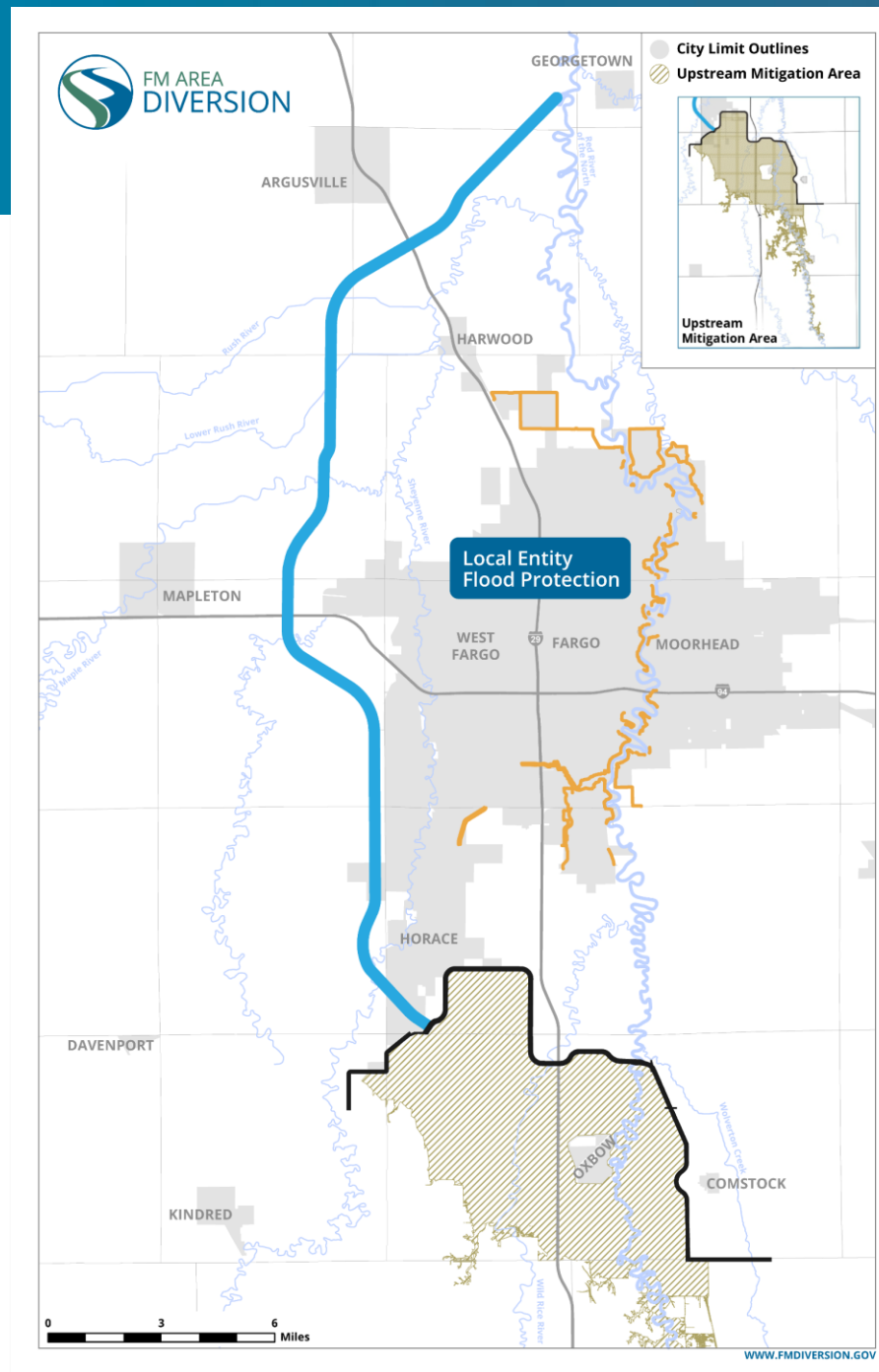
Components

Levees & floodwalls

Stormwater lift stations

County & township road improvements and grade raises

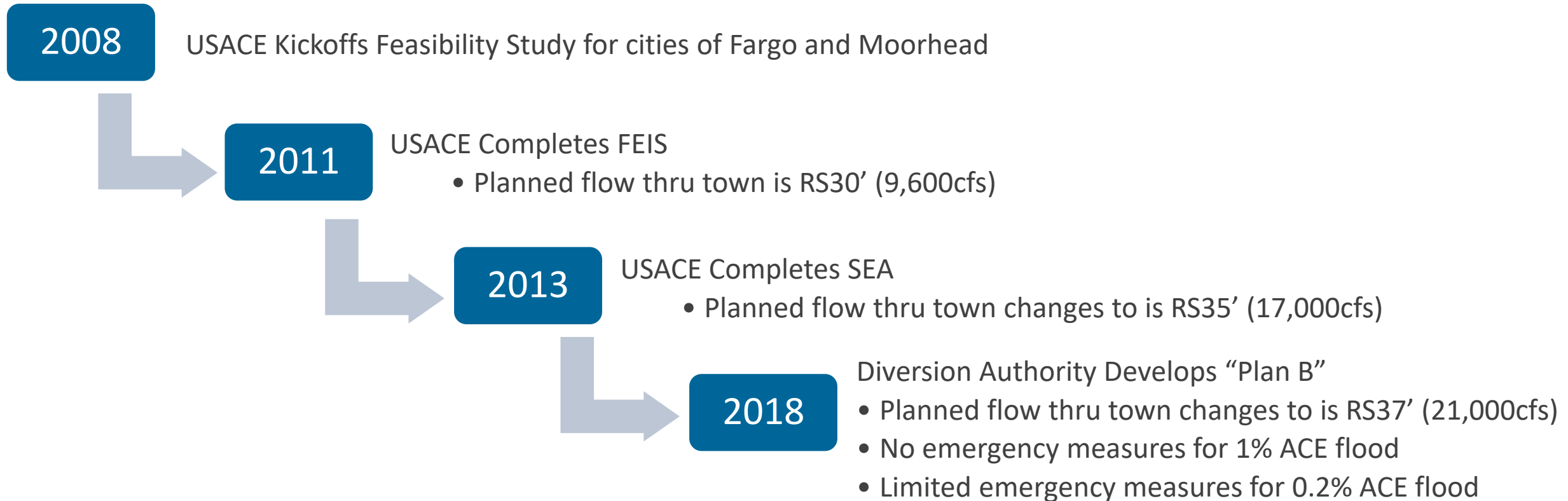
Goal: safely pass a river level of 37 feet through town during a 100-year flood without the need for emergency measures



In-Town Flood Protection



Why build flood mitigation measures where we are?



Additional Considerations

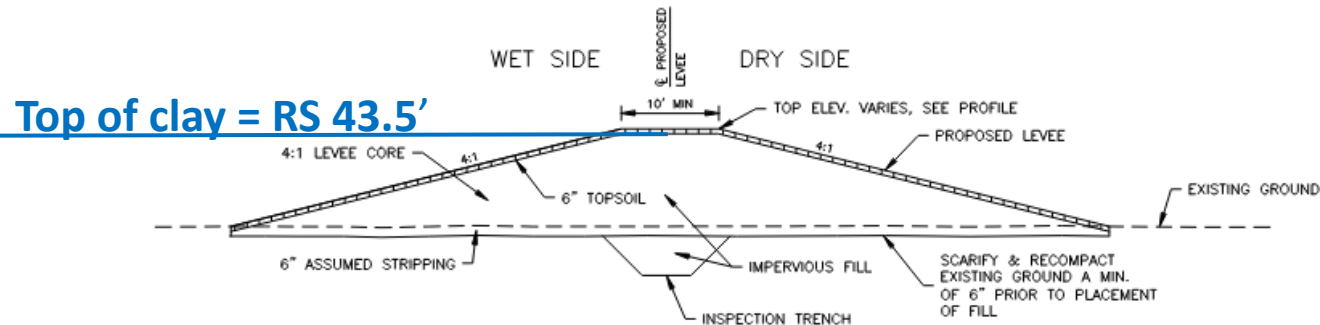
- 2009, 2010, 2011, 2013 & 2019 Floods
- Initial uncertainty of when the Diversion would be constructed

In-Town Flood Protection

How were the protection levels of levees and floodwalls determined?

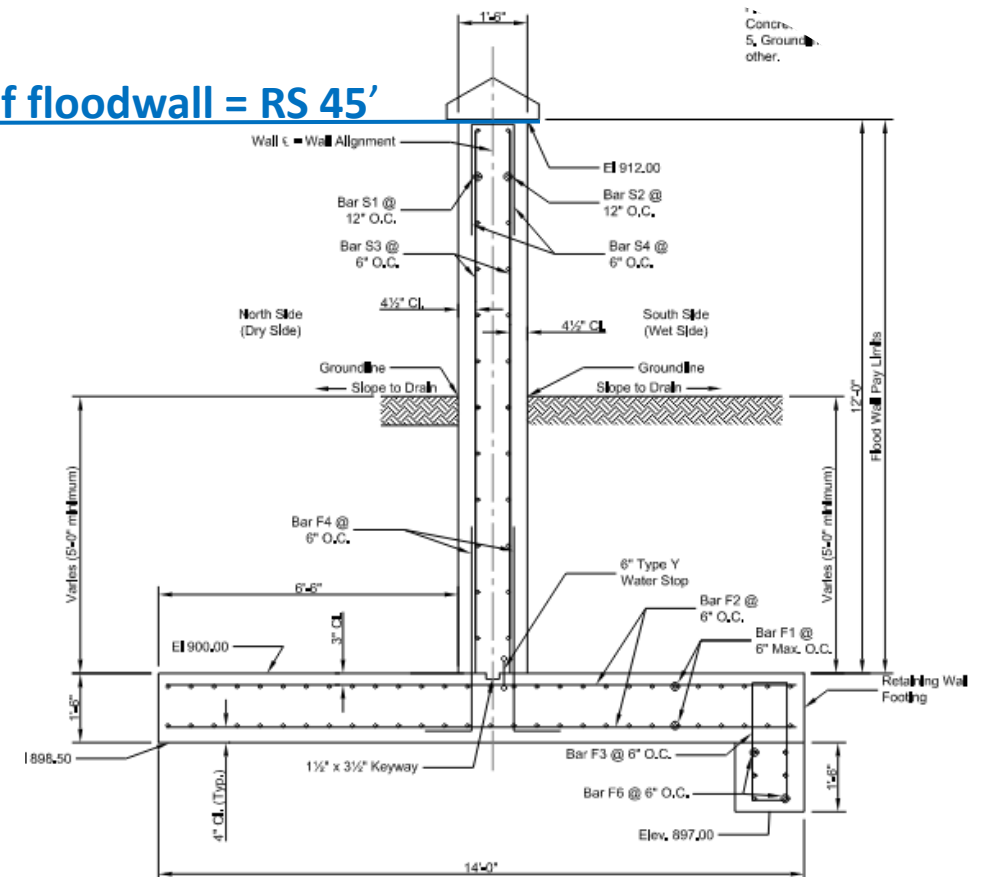
Decision factors were:

- Both cities utilize same protection levels
- CFR 65.10 freeboard requirements for current FEMA mapped floodplain elevations
- Flood of record river levels (2009 – RS40.84')
- 0.2% ACE Flood Levels Post FM Diversion



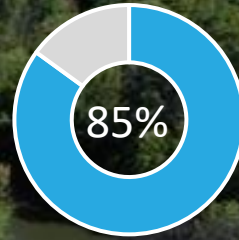
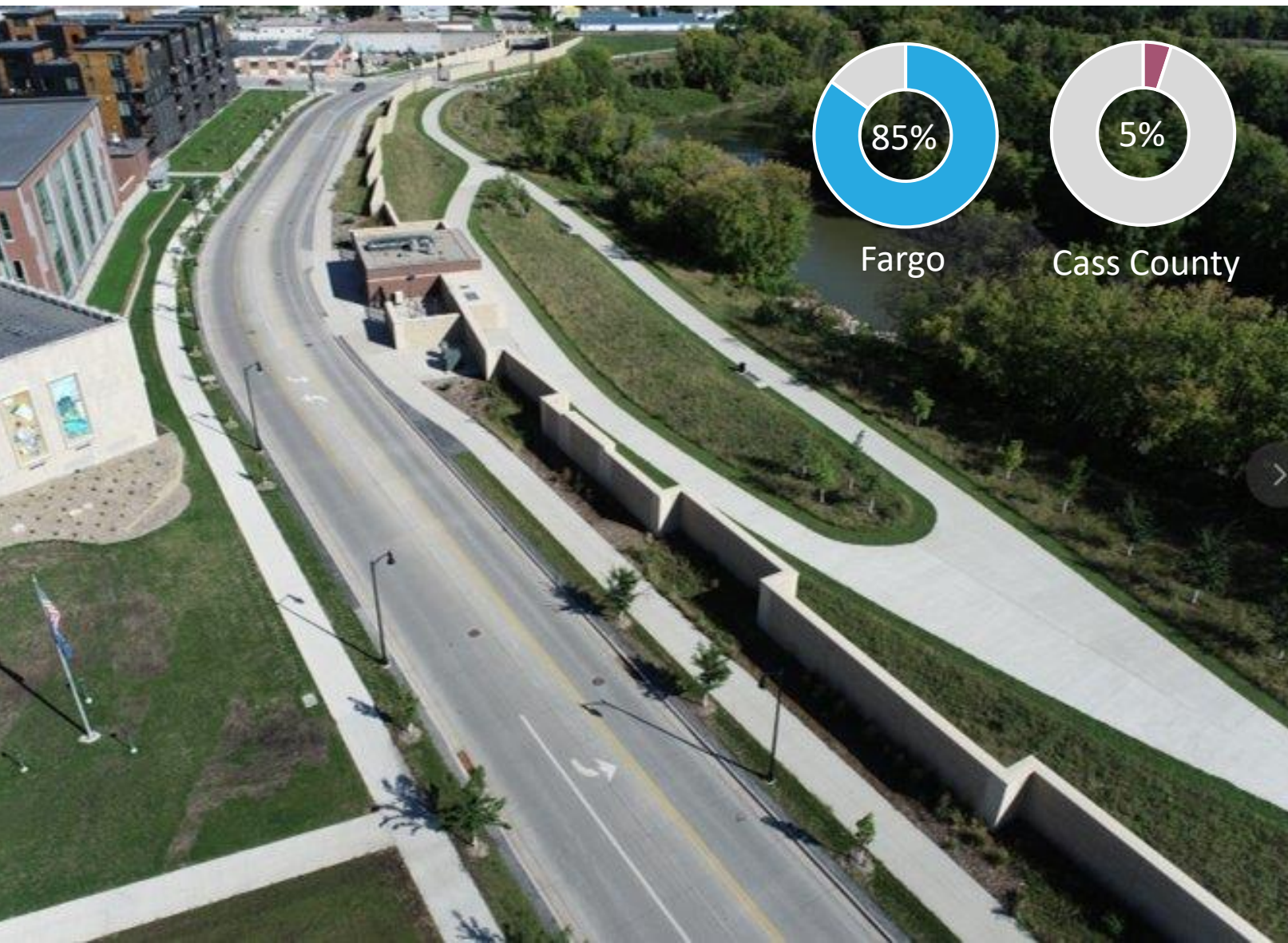
TYPICAL LEVEE SECTION
NOT TO SCALE

Top of floodwall = RS 45'

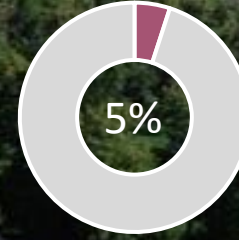


FLOODWALL TYPICAL SECTION

In-Town Flood Protection



Fargo



Cass County



Construction Overview

Projects began in 2009 to allow for up to 37 feet of floodwater to flow safely through town

Project Details

Over 27.5 miles of levee/floodwalls
4.4 miles county road improvements/
grade raises

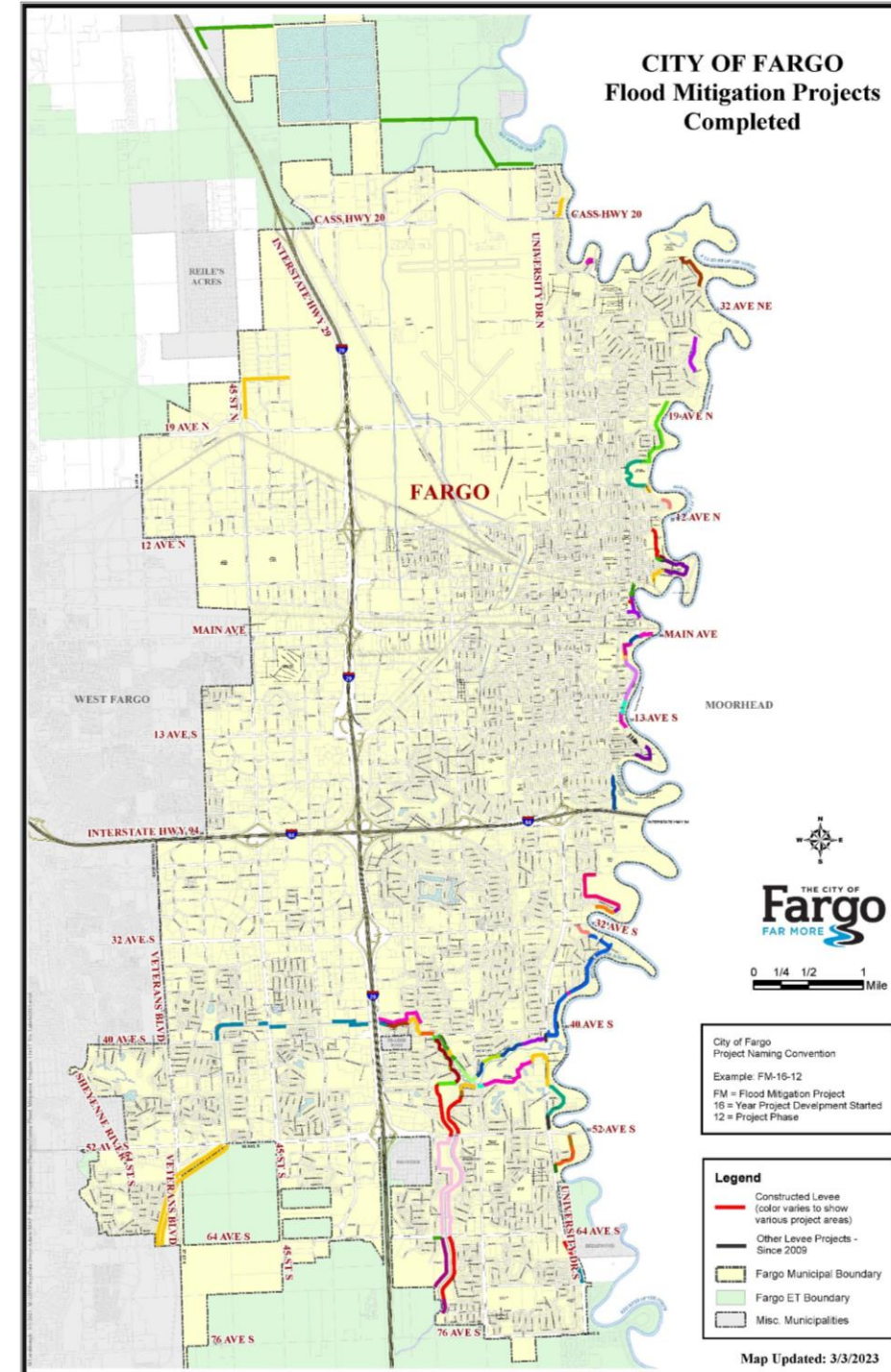
In-Town Flood Protection

Since 2009

- Constructed approximately 27.5 miles
 - 47 miles of emergency levees constructed by the City in 2009
- Acquired 259 Properties
 - Over 400 since 1990
- Over 120 private property easements purchased
- Reconstructed 18 storm sewer lift stations
- Project Cost \approx \$350 million

Reduces required sandbags by approximately 5.5 million

- Needed over 6 million in 2009

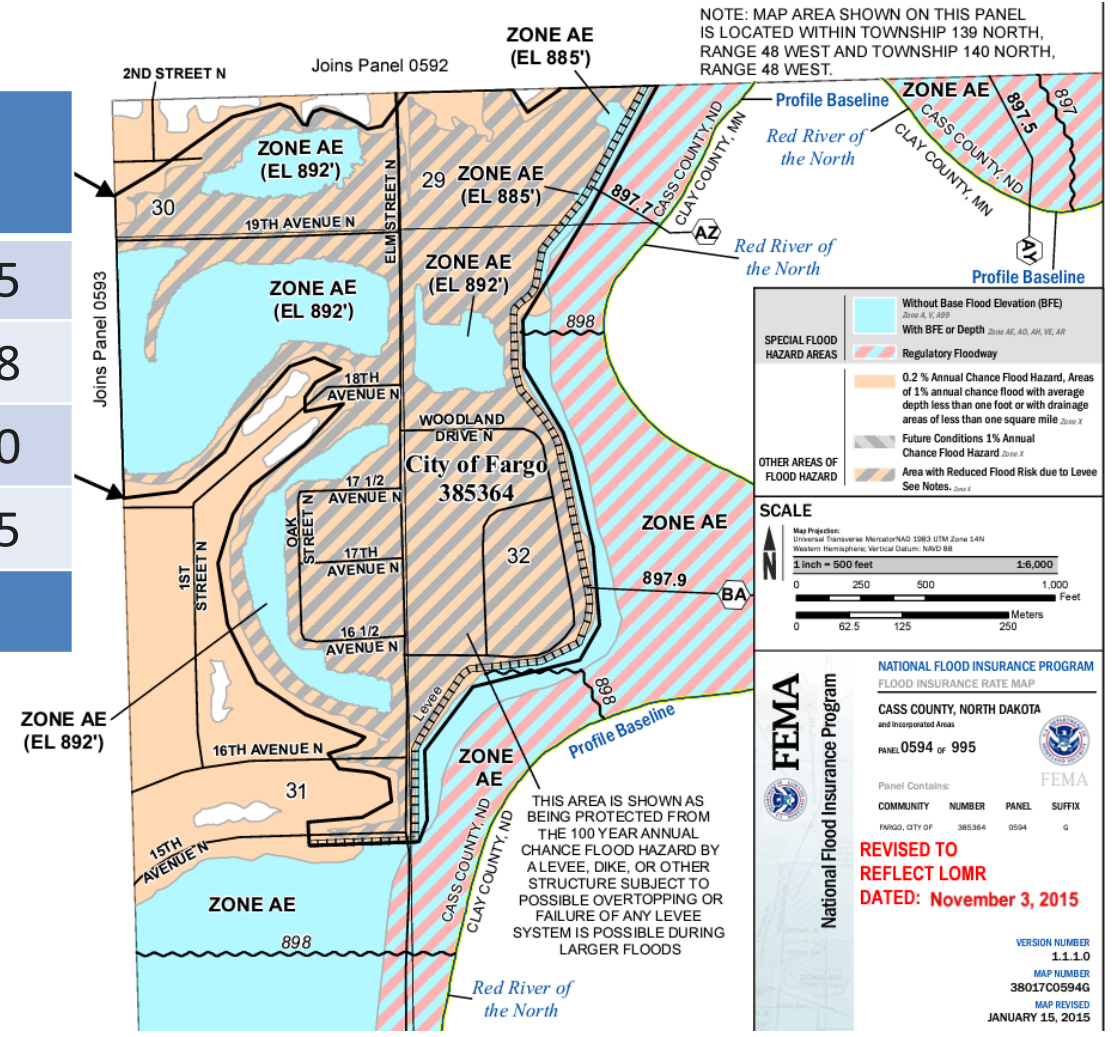


In-Town Flood Protection



FEMA Accreditation (2015 FEMA FIRM)

Area	# of Parcels	# of Structures	Date
VA Hospital/Ridgewood	146	105	11-03-15
El Zagal Area	31	10	09-18-18
Mickelson Field Area	64	51	06-09-20
4 th Street S	312	285	01-15-15
Total	553	451	



In-Town Flood Protection



In-Town Flood Protection



In-Town Flood Protection

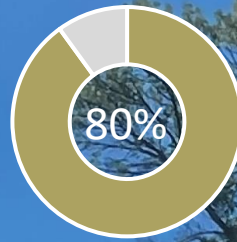


In-Town Flood Protection

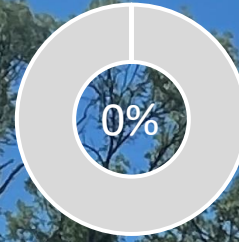




In-Town Flood Protection



Moorhead



Clay County



Construction Overview

Projects began in 2009 to allow for up to 37 feet of floodwater to flow safely through town

Project Details

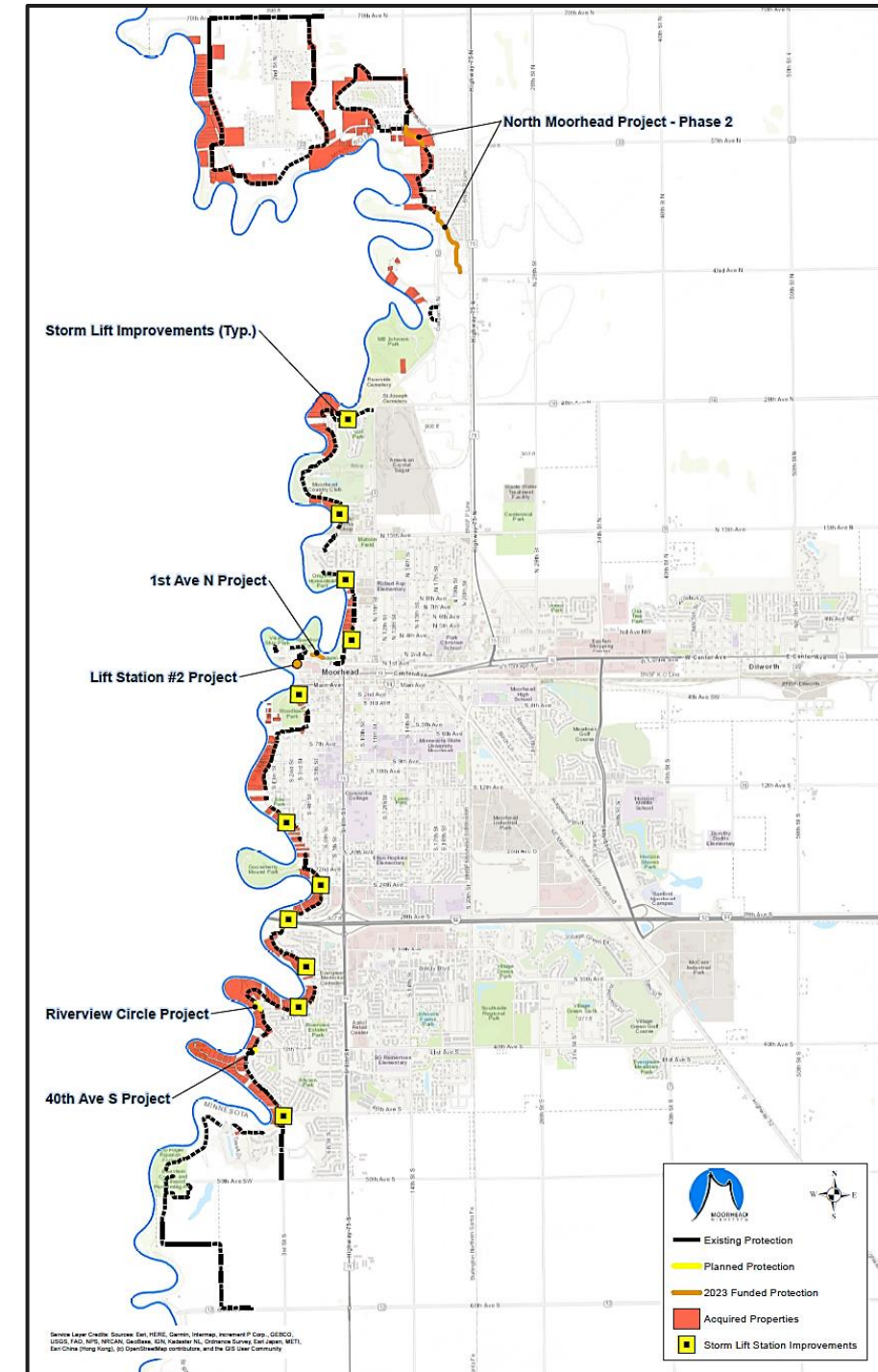
18.8 miles of levee/floodwalls

4 miles county road improvements/grade raises

In-Town Flood Protection

Since 2009

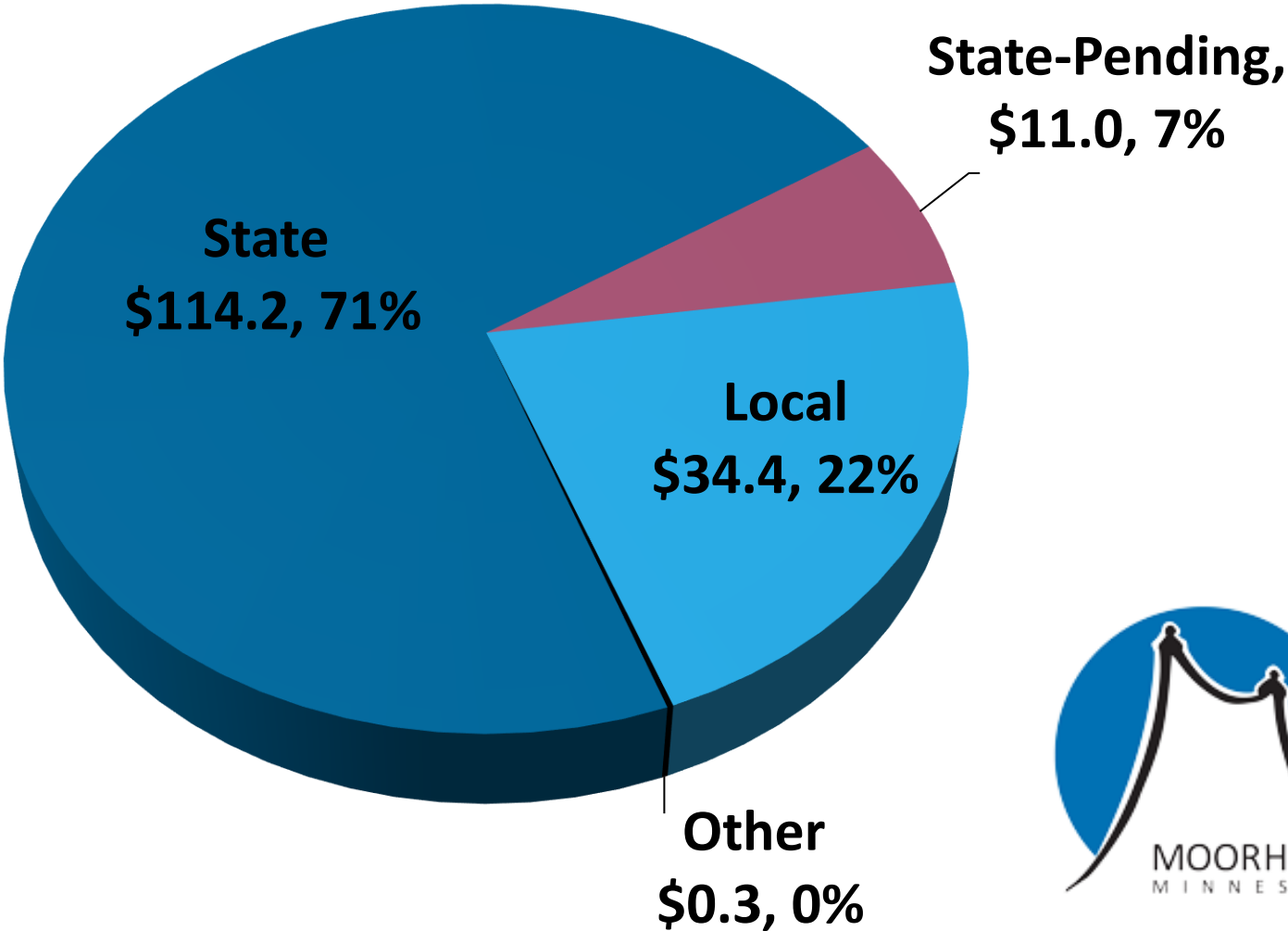
- Constructed approximately 18.8 miles
 - 18 miles of emergency levees constructed in 2009
- Acquired 337 Properties
 - 387 since 1990
- Acquired 99 private property easements
- Constructed/reconstructed 24 stormwater lift stations
- Project Cost \approx \$149 million (completed work)
 - Reduces required sandbags by approximately 2.8 million
 - Used over 2.5 million in 2009



In-Town Flood Protection



Total Investment (\$M): \$159.9



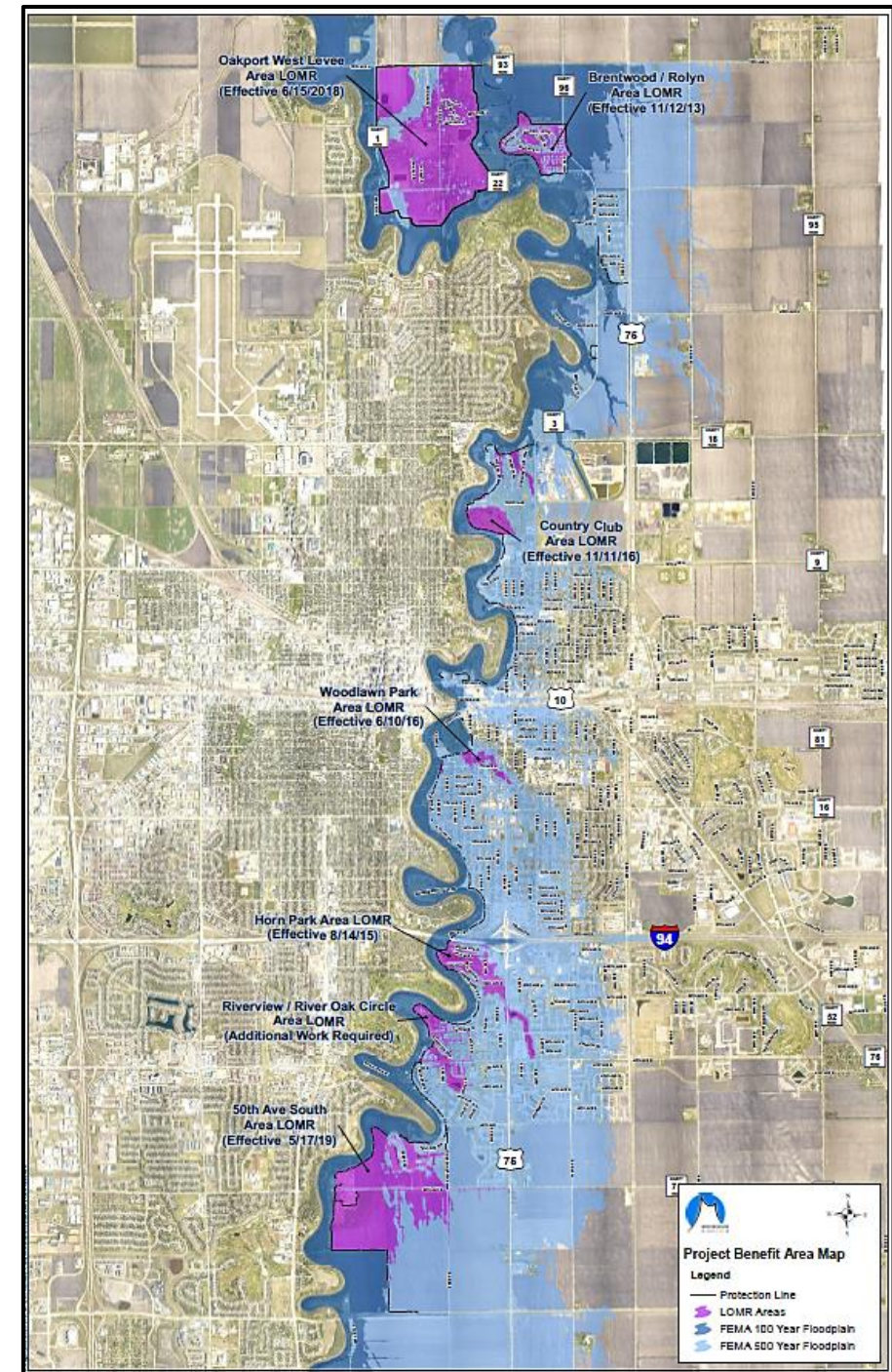
Buffalo-Red River Watershed District: Oakport (annexed in 2015)		
State		\$31M
Local		\$5M
Total		\$36M



In-Town Flood Protection

FEMA Accreditation (2012 FEMA FIRM)

Area	# of Parcels	# of Structures	Date
Horn Park	117	87	08-14-15
Woodlawn Park	37	35	06-10-16
Country Club	45	7	11-11-16
50 th Ave S	55	0	05-17-19
Brentwood	102	36	11-12-13
Oakport West Levee Area	177	165	06-15-18
Total	533	330	



In-Town Flood Protection



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In-Town Flood Protection



Flood Buyout Lots - Opportunities

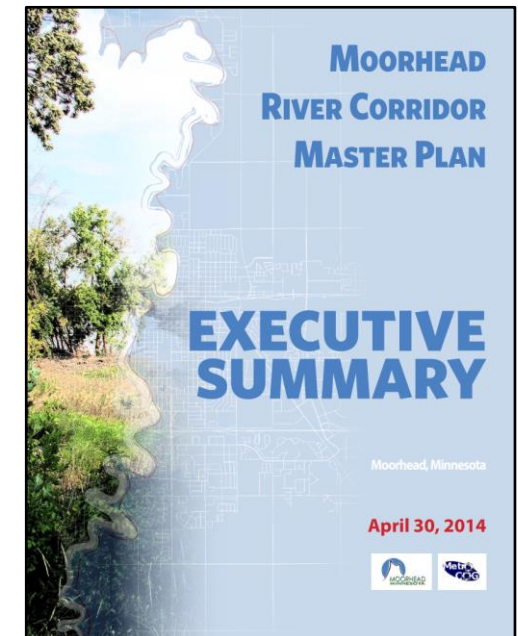


More than **500** acres
to public use from flood buyouts
within both cities



Principles

- Flood Mitigation
- Attractive River Corridor
- Connectivity
- Recreation
- Habitat Enhancement & Water Quality
- Interpretation



Flood Buyout Lots - Opportunities

River Corridor Plan Accomplishments

Trails

- Additional paved trails within buyout lots
- Increased connectivity between existing trail systems
- Pedestrian bridge across Red River (additional one planned)
- Off-road trails in partnership with FM Trailbuilders

Multiple natural prairie planting sites in partnership with Audubon Great Plains

Multiple events & amenities in partnership with Fargo Park District, Moorhead Parks & Recreation, and River Keepers

Multiple new amenities in parks along the river

- Examples include: Disc Golf, Cross Country Skiing Trails, Sledding Hills, etc.



Post-Diversion Floodplain Management



- Overall Project LOMR Timing/Implementation
- Interested Parties
 - Property owners
 - Development community
 - Elected officials
 - Minnesota and North Dakota state officials
- Unknowns
 - Future building elevation requirements
 - New subdivision requirements (i.e. levees, pump stations, street elevations, etc.)



Questions?

