The Fargo-Moorhead Area Diversion Project

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Agenda

• Flood History and Project Need
• Federal Project
• Diversion Project Operations
• Diversion Project Design and Features
• Navigation Through Federal Authorization and Funding
• Public Private Partnership
• Construction and Schedule
Flood History and Project Need
Red River Basin

Total Drainage Area: 45,000 square miles

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

North Dakota

South Dakota

Minnesota

Q_{100} year = 34,700 cfs
Q_{500} year = 61,700 cfs
Q_{max} 2009 = 29,500 cfs
Flood flow frequency and magnitude since 1900 shows transitions from dry to wet cycles.

- 16 floods have exceeded the "Major Flood Stage" since 1900.
- 8 of the 16 "major" floods have occurred between 2000 through 2015.

The 2009 flood is the largest flood on record and equates to a 50-Year Flood Event.

Source: USGS river flow data from USGS Station
Winter Weather adds dangerous element to the flood fight
Volunteers Fill the Fargo Dome (2009)
7 Million Sandbags – 150,000 Volunteer Hours
Transportation Challenges

Interstate 29
Closed April 10 - Reopened April 15, 2011
Detour added = 22.8 miles
By the numbers: Flood Insurance

- 11,000 homes impacted by future FEMA floodplain
- $3,000-$5,000 per family
- Average annual flood insurance premium per home
- In total, annual flood insurance premiums ~$30 to $50 million
<table>
<thead>
<tr>
<th>Year</th>
<th>Events</th>
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</thead>
<tbody>
<tr>
<td>1997</td>
<td>Cass County initiates Flood Mitigation Study</td>
</tr>
<tr>
<td>2001</td>
<td>Study recommends Southside Flood Protection Project</td>
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<tr>
<td></td>
<td>Receives $9.5 Million FEMA Grant</td>
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<tr>
<td>2002</td>
<td>Project/Funds transferred to City of Fargo</td>
</tr>
<tr>
<td>2006</td>
<td>4 alternatives presented to public</td>
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<tr>
<td>2008</td>
<td>5 alternatives presented to public</td>
</tr>
<tr>
<td></td>
<td>60+ small group meetings</td>
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<tr>
<td>2009</td>
<td>Flood of Record</td>
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The Federal Project
Numerous Alternatives Studied

- Distributed Storage
- ND West Diversion 45K
- ND West Diversion 35K
- MN Short Diversion 25K
- Southside Protection Plan
- No Action
- ND East Diversion 35K
- MN Short Diversion 35K
- MN Long Diversion 25K
- Levee 2% chance
- Levee 1% chance
- MN Short Diversion 45K
- MN Long Diversion 35K
- MN Long Diversion 45K
Criteria for Evaluating Alternatives

Impact
- Structures and Homes
- Economic Impact
- Farm Land Impacted
- Cleanup after flood event
- Infrastructure

Level of Protection
- $ Damages Prevented
- Lives and Livelihoods
- City Infrastructure
- Flood Insurance

Cost
- Build
- Maintain
- Operate
- Structures and Homes
Federal Project

► Diversion Channel
  ► 30-mile long, 1,600 ft wide

► In-Town Levees
  ► Over $300M to date

► Southern Embankment & Upstream Staging Area
  ► 150,000 acre-feet
  ► Impacts ~100 residential properties
  ► Mostly farmland

► Provides 100-year Flood Risk Reduction

► Extreme Events are Flood-Fightable
Flood threat without Project

FM Area
100-year flood event without the FM Area Diversion Project
FM Area
100-year flood event with the FM Area Diversion Project
Timeline of Federal Actions

2008 - City of Fargo, North Dakota and Moorhead, Minnesota sponsor USACE Feasibility Study

► 2007 – Congress passes Water Authorization Bill

2009 – Flood of Record accelerates federal process

► Feasibility Study Completed July 2011
► Chief’s Report Signed Dec 2011
► Record of Decision Signed Apr 2012

* Active Project Sponsor helped accelerate Project (Technically and Politically)
Project Authorization in 2014 WRRDA

- First Water Authorization bill since 2007
  - 1 of only 26 water projects included
  - Authorized for $846M
  - Prior work enabled us to be well positioned for Authorization
- Seized the “Window of Opportunity”
Obstacles to Federal Funding

- Large projects are penalized by the system
- B:C – Met Requirements, but OMB wanted higher
- Avoidance of long-term funding commitments – makes short-term projects easier
- North Dakota faced “clout drought” having lost two U.S. Senators in ranking positions on Appropriations and Budget Committees
  - Elimination of earmarks
- USACE faced $60 Billion in project backlog, directed to clear the queue
- Congress had directed USACE to develop innovative implementation methods
Split Delivery Plan

- Diversion Channel and Associated Infrastructure
  - Non-Federal Sponsors (Diversion Authority)

- Southern Embankment and Associated Infrastructure, and Mitigation
  - USACE
Split Delivery Plan

► Decision to split project made prior to P3
► Worked financially with Federal share capped
► Work in Kind allows locals to spend their share (local $)
► Allows an accelerated project delivery which provides flood protection benefits sooner
► Allows implementation of the most cost-effective option to flood risk management for FM Metro
► Safeguards a population of 225,000 persons and $14 Billion in property value
► Allows USACE to design/construct High Hazard Dam and mitigation features.
Public-Private Partnership (P3)
Innovative delivery of the nation’s infrastructure
PPP is Growing in Popularity

37 States Enable P3s
As of January 2017

- Enabling vertical and horizontal P3s to some degree (24 states and DC)
- Enabling only vertical P3s to some degree (2 states)
- Enabling only horizontal P3s to some degree (11 states and PR)

Note: 36 states and DC authorize P3s by statute/regulations or limited partnerships. In these states, P3s may be authorized on a specific project(s) or project type.
Traditional Delivery Method (DBB)

- Public Agency
  - Design Contract
    - Engineering Firm
  - Construction Contract
    - Contractor
  - O&M Contract
    - O&M Provider

- Credit & Security
- Lenders (Debt)
Typical PPP Model (DBFOM)

Public Agency

Lenders (Debt)

Direct Lender Agreement

Shareholders Agreement

Special Purpose Vehicle (SPV)

Loan Agreements

Lenders (Debt)

Equity Providers

Design Build

Subcontractors

Subcontract

Operation & Maintenance

Subcontractors

Subcontract

Public Agency

Lenders (Debt)

Direct Lender Agreement

Shareholders Agreement

Special Purpose Vehicle (SPV)

Loan Agreements

Lenders (Debt)

Equity Providers

Design Build

Subcontractors

Subcontract

Operation & Maintenance

Subcontractors

Subcontract
Long-Term Funding and Financing Plan

Sales tax revenues assume a 3% growth rate. (Historical Growth Rate = 4%)

Future Sales Tax Revenue Could be used for early debt retirement

Post-Construction Payments Begin in 2025
Why P3 was chosen

► Allows multi-generational payback for large projects
► Utilizes multiple, long-term alternative financing
► Promotes delivery innovation
► Schedule and cost certainty
► Assigns risk to the party most able to manage the risk
► Provides performance guarantees and long-term warranties
► Shortens schedule – achieves flood risk reduction sooner
► Surest route to Federal dollars
P3 Secured Route to “New Start”

Increased Federal Return on Investment

- Reduced federal funding from the authorized amount of $846M to $450M on a $2.2B project

- Fargo Mayor Dr. Tim Mahoney – “Any Community that is looking to deliver a major public infrastructure project such as the FM Diversion, needs to forego the idea of entitlement to traditional federal cost shares. Mr. Mulvaney, the Director of OMB, expressed when we met that the willingness of our community to tax themselves and reduce the Federal investment, coupled with the use of private equity is exactly the type of innovation that will be necessary to allow the Federal government to use their various strengths and authorities to move projects forward.”

USACE Demonstration Project

- Designated as “demonstration project” to demonstrate ability of innovative delivery methods

Local Funding Matched P3 Financial Plan

- Three voter-approved long-term sales taxes to allow for a multi-generational P3 payment structure
Project Receives Final Federal Approvals

Federal Appropriations for Construction received in 2016 USACE Work Plan

• ‘New Start’ Secured as 1 of 6 New Projects in the Country

Project Partnership Agreement Signed in July 2016
Construction and Schedule
Construction Begins - USACE

Diversion Inlet Control Structure

-$50M Contract Award by USACE to Ames Construction

Gated control structure that will control the amount of water that enters the diversion channel from the upstream staging area.

Features three 50-foot wide tainter gates

Located South of Horace, ND

Construction start in Spring 2017

Complete in 2020
Project Timeline

Study & Design
2008-2016

Construction
2017-2024

Operate
2024

RFQ
RFP
P3 construction

WRRDA
Federal Construction

Federal Feasibility Study
Federal Approval for Construction

Upcoming Construction

Remainder of Construction will be delivered through traditional DBB (SEAI – USACE) and P3 (DSAI – FMDA)
FIND US ONLINE

- FMDiversion.com
- @FMDiversion
- Newsletter
- Youtube Channel
Project Design Features
Diversion Channel Cross Section

Total Width = 1,600
Typical County Bridge Aesthetics
I-29 Bridge Rendering
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
Diversion Inlet Control Structure
Aqueduct Structures
Conceptual Maple River Aqueduct Structure Illustration
Maple River Aqueduct Physical Model