



**FLOOD DIVERSION BOARD OF AUTHORITY  
MARCH 10, 2016—3:30 PM**

**1. MEETING TO ORDER**

A meeting of the Flood Diversion Board of Authority was held Thursday, March 10, 2016, at 3:30 PM in the Fargo City Commission Room with the following members present: Cass County Commission representative Darrell Vanyo; Cass County Commissioner Mary Scherling; West Fargo City Commissioner Mike Thorstad; Fargo City Mayor Tim Mahoney; Fargo City Commissioner Melissa Sobolik; Cass County Joint Water Resource District Manager Rodger Olson; Clay County Commissioner Kevin Campbell; and Moorhead City Council Member Nancy Otto. Also present was ex-officio member Gerald VanAmburg, Buffalo-Red River Watershed District. Fargo City Commissioner Mike Williams was absent.

Staff members and others present: Cass County Administrator Keith Berndt; Fargo City Administrator Bruce Grubb; Clay County Administrator Brian Berg; Cass County Engineer Jason Benson; Fargo City Director of Engineering Mark Bittner; Fargo City Engineer April Walker; Moorhead City Engineer Bob Zimmerman; Mark Nisbet, Chamber of Commerce Business Leaders Taskforce; and Martin Nicholson, CH2M Hill.

**2. MINUTES APPROVED**

*MOTION, passed*

**Mr. Mahoney moved and Mrs. Scherling seconded to approve the minutes from the February 25, 2016, meeting as presented. Motion carried.**

**3. AGENDA ORDER**

*MOTION, passed*

**Mr. Campbell moved and Mrs. Scherling seconded to approve the order of the agenda. Motion carried.**

**4. MANAGEMENT UPDATE**

*Program management consultant (PMC) report*

Martin Nicholson provided an update on activities over the last month including work on in-town levees; completion of demolition work on the Park East Apartments and beginning demolition work on the Howard Johnson Hotel; assistance with responses to public comments for the Minnesota Draft EIS (MN DEIS); submittal of North Dakota and Minnesota dam safety and construction permits; and support to the Corps of Engineers with the 404 permit application.

Mr. Nicholson reviewed the 2016 key activities schedule. He said an updated cost estimate and financial plan will be presented to the board in next month. He also discussed the JPA approval process, and preparation of the Request for Qualifications (RFQ) and Request for Proposals (RFP) as part of the procurement strategy for the Public Private Partnership (P3).

Keith Berndt, April Walker and Nathan Boerboom attended a P3 conference in Dallas, Texas this week. Mr. Berndt said one of the topics discussed was the importance of upfront work with P3 projects. Ms. Walker said there appears to be significant interest from developers about the diversion project.

**5. ADMINISTRATIVE/LEGAL UPDATE**

Attorney John Shockley said the financial plan should be released to the board in April, and work continues on the draft amendment to the Limited Joint Powers Agreement with a few more substantive comments to be incorporated into the document.

**6. TECHNICAL UPDATE**Recommended Contracting Actions Summary

Mr. Nicholson reviewed the following contracted actions with the board:

Task Orders

- Beaver Creek Archaeology, Inc. Task Order No. 1 Amendment 1 (Phase 1 Cultural Resources Investigations)—add requirements for monthly invoicing and status reporting, and extend period of performance to December 31, 2016, at no cost;
- URS Corporation Task Order No. 1 Amendment 4 (Phase 1 Cultural Resources Investigations)—add scope and budget for ongoing project management, additional fieldwork and on-call services, and add requirements for monthly invoicing and status reporting in the amount of \$147,000;
- HMG Task Order No. 1 Amendment 7 (Project Management)—add funding for project management and public involvement assistance, add requirements for monthly schedule updates, add requirements for monthly invoicing and status reporting, and extend period of performance to December 31, 2016, in the amount of \$398,000;
- HMG Task Order No. 6 Amendment 8 (Land Management)—add requirements for monthly invoicing and status reporting, and extend period of performance to December 31, 2016, at no cost;
- HMG Task Order No. 7 Amendment 5 (Recreation and Use Master Plan and Design)—add requirements for monthly invoicing and status reporting, and extend period of performance to December 31, 2016, at no cost;
- HMG Task Order No. 10 Amendment 7 (Utilities Design and Identification of Outlet to I-94 North, I-94 to Staging Area South; and Red River Levees Project Area)—add requirements for monthly invoicing and status reporting, and extend period of performance to December 31, 2016, at no cost;
- HMG Task Order No. 11 Amendment 4 (Design for Reach 6 and CR-20 Bridge)—reallocate existing funding, add requirements for monthly invoicing and status reporting, and extend period of performance to June 30, 2016, at no cost;
- HMG Task Order No. 14 Amendment 4 (Transportation and Local Drainage Master Plans South)—reallocate existing funding, add requirements for monthly invoicing and status reporting, and extend period of performance to December 31, 2016, at no cost;
- HMG Task Order No. 15 Amendment 3 (Draft Operations Plan)—add requirements for monthly invoicing and status reporting, and extend period of performance to December 31, 2016, at no cost;
- HMG Task Order No. 16 Amendment 3 (Permit Submittal Preparation)—add scope and budget to develop and prepare FEMA Conditional Letter of Map Revision (CLOMR), North Dakota and Minnesota Dam permit applications, add requirements for monthly invoicing and status reporting, and extend period of performance to December 31, 2016, in the amount of \$100,000;
- HMG Task Order No. 18 Amendment 1 (Design of CR-16/CR-17 Bridge)—add scope and budget for design modification of Drain 47 outlet structure, add road and channel design updates, add requirements for monthly invoicing and status reporting, and extend period of performance to December 31, 2016, in the amount of \$253,485;
- HMG Task Order No. 19 Amendment 1 (P3 Document Preparation Support)—add requirements for monthly invoicing and status reporting, and extend period of performance to December 31, 2016, at no cost.

***MOTION, passed***

**Mr. Mahoney moved and Ms. Otto seconded to approve the appropriation of funds for the task orders as outlined, and recommend approval of the appropriation of funds by the Dakota Metro Flood Board for the Diversion Authority. On roll call vote, the motion carried unanimously.**

**7. PUBLIC OUTREACH UPDATE**Committee report

Mr. Olson said the Public Outreach Committee met on March 9<sup>th</sup>. He and other officials were in Bismarck the past few days attending the North Dakota Water Topics Overview Committee and State Water Commission meeting. Mr. Vanyo said earlier today he provided an update on the diversion project to an Emergency Management class at NDSU.

Business Leaders Task Force

Mark Nisbet said chamber members appreciated the attendance at a presentation by the MN DNR during the monthly “Eggs and Issues” meeting held earlier this week. He said business leaders will continue to stay involved in public outreach activities associated with the diversion project.

**8. LAND MANAGEMENT UPDATE**Committee report

Mr. Mahoney said the Land Management Committee met on March 9<sup>th</sup> and approved one property acquisition with the BNSF Railroad for an undeveloped riverside parcel.

CCJWRD update

Mark Brodshaug referred to the handout regarding land acquisitions completed through March 10, 2016, which includes completed acquisitions, budget figures, and completed negotiations. He said critical in-town property negotiations are underway with Mid-America Steel and Case Plaza, and the Corps of Engineers has approved updated appraisals for these acquisitions; demolition activities are substantially complete at Park East Apartments and are just beginning at the Howard Johnson Hotel and former Shakey’s Pizza property; 15 homes are currently under construction in Oxbow; and pre-property acquisition efforts have begun for diversion inlet area lands.

**9. FINANCE UPDATE**Committee report

Mike Montplaisir, Cass County Auditor, said the Finance Committee met on March 9<sup>th</sup>. The committee reviewed the monthly financial report, vouchers, one property acquisition and task orders.

Task Orders

For consideration today are three task orders totaling approximately \$9.5 million with CH2M Hill, Ernst & Young Infrastructure Advisors, LLC, and Ashurst LLP. John Shockley said CH2M Hill will continue to provide program management services as well as support with P3 procurement; Ernst & Young will work on the financial analysis for the P3, and assist with RFQ and RFP development; and Ashurst LLP will assist the legal aspects of the P3 procurement process. Mr. Vanyo said the task orders will help expedite the work needed to prepare the Project Partnership Agreement (PPA) and assist with P3 process.

***MOTION, passed***

**Mr. Mahoney moved and Mrs. Scherling seconded to approve the appropriation of funds for the following task orders and recommend approval of the appropriation of funds by the Dakota Metro Flood Board for the Diversion Authority: On roll call vote, the motion carried unanimously.**

- **CH2M Hill Task Order No. 6 for \$6,300,000**
- **Ernst & Young Infrastructure Advisors, LLC Statement of Work No. 2 for \$1,177,000**
- **Ashurst LLP Work Order No. 3 for \$1,979,133.70**

Voucher approval

The bills for the month are with CCJWRD for costs associated with in-town levees, access issues, Diversion Project Assessment Committee (DPAC) work, OHB levee, and Oxbow Country Club golf course construction; Fredrikson & Byron, P.A. for government relations services; Dorsey & Whitney LLP for legal services; Warner & Company for liability insurance policy; Army Corps of Engineers for

cost share funding; North Dakota Water Users Association for membership dues; BNSF Railroad for water main crossing permit, temporary occupancy permit, and storm sewer crossing permit processing fees; and Ohnstad Twichell for P3 bond counsel.

***MOTION, passed***

**Mr. Mahoney moved and Ms. Sobolik seconded to approve the vouchers in the amount of \$2,293,525.40 for February, 2016. On roll call vote, the motion carried unanimously.**

**10. NEXT MEETING DATE**

The next meeting will be held on *Thursday, March 31, 2016 at 3:30 PM.*

**11. ADJOURNMENT**

***MOTION, passed***

**On motion by Ms. Sobolik, seconded by Mrs. Scherling, and all voting in favor, the meeting was adjourned at 4:24 PM.**

Minutes prepared by Heather Worden, Cass County Administrative Assistant

# 2016 Cost Estimate Update

Presented by

CH2M

March 31, 2016

# Presentation Outline

- 💧 Background Information about Costs and Funding
- 💧 Inform the DA Entities about the current Project  
Cost Estimate
- 💧 Assumptions for Financial Plan
- 💧 Q&A

# 2011 Final Feasibility Study cost estimate set initial funding requirements

## Final Feasibility Report and Environmental Impact Statement

Fargo-Moorhead Metropolitan Area  
Flood Risk Management

July 2011



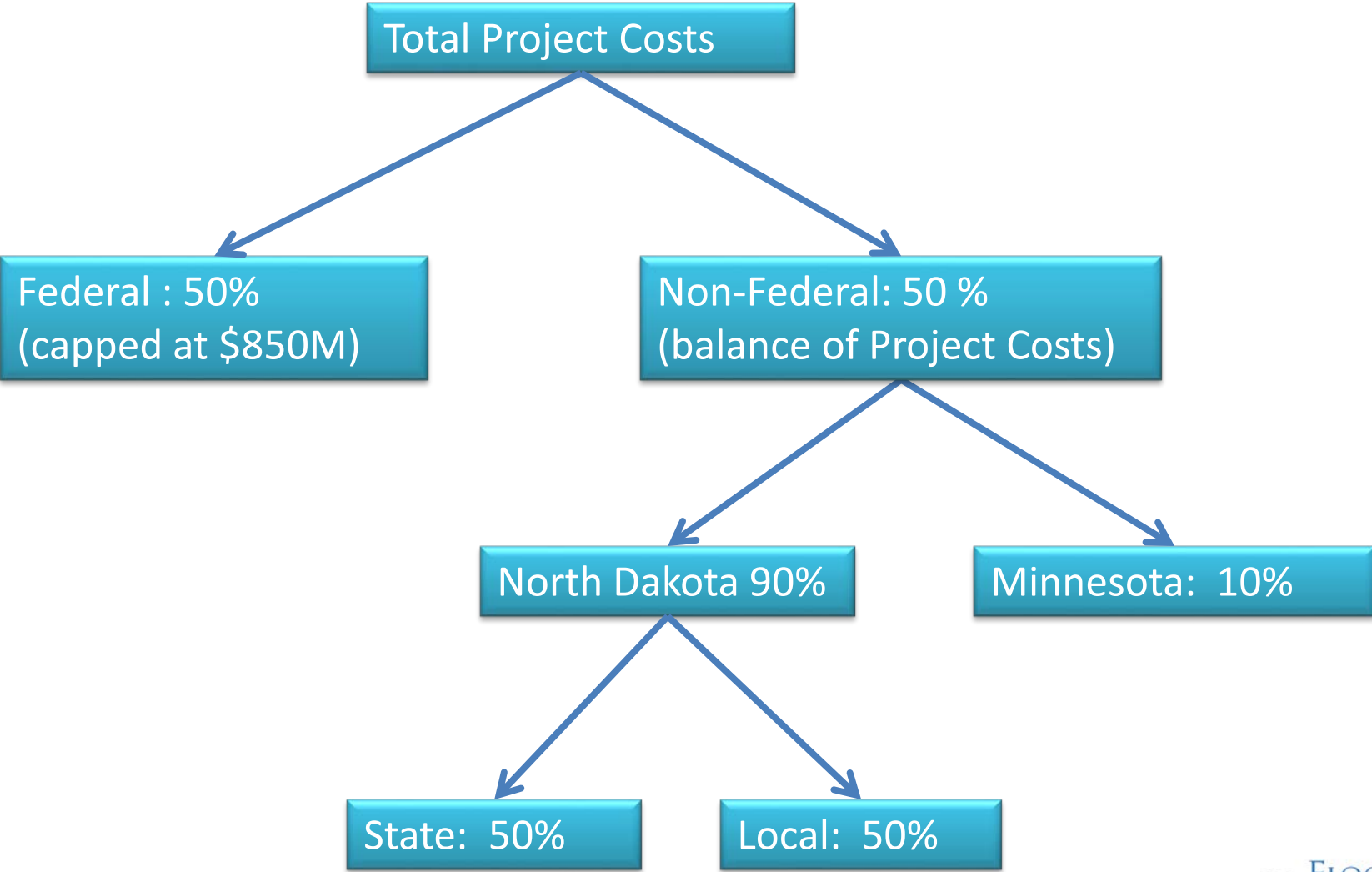
**US Army Corps  
of Engineers**®

*Prepared by:*  
U.S. Army Corps of Engineers  
St. Paul District  
180 Fifth Street East, Suite 700  
St. Paul, Minnesota 55101-1678

Base Cost:	\$1.4B
Contingency	<u>\$0.4B</u>
Total Cost	\$1.8B



# 2011 Stakeholders and Funding Assumptions



# Presentation Outline

- Background Information about Costs and Funding
- Inform the DA Entities about the current Project Cost Estimate**
- Assumptions for Financial Plan
- Q&A

# 2016 Cost Estimate Update

- 💧 2012 Independent CH2M Estimate Update
- 💧 2016 Independent CH2M Estimate Update
- 💧 2012 to 2016 Changes
- 💧 Risk, Opportunity, and Contingency

# 2012 to 2016 Estimate Comparison

	<b>2012 Estimate (million \$)</b>	<b>2016 Estimate Update (million \$)</b>	<b>Difference (million \$)</b>
<b>Construction</b>	\$1,089	\$1,201	\$112
<b>Land</b>	\$236	\$401	\$165
<b>Soft Costs</b>	\$230	\$328	\$98
<b>Contingency Risk/P3 Opportunity</b>	\$220	\$196	(\$24)
<b>Total</b>	\$1,775	\$2,126	\$351

# Summary of 2012 to 2016 Changes

- 💧 Escalation
- 💧 Construction Scope
- 💧 Land Costs
- 💧 Soft Costs

# Estimate is Presented in December 2015 Dollars

- 💧 Cost Estimate developed using material take-offs and unit-price bottom-up estimate expressed in December 2015 dollars
- 💧 Future escalation to year of expenditure will be included in the Ernst & Young Infrastructure Advisors Financial Model

# Cost Estimate - Basis

## 💧 *CCI-CH2M HILL Constructors, Inc.*

### 💧 Bottom-up estimate in 2012

- 💧 Accounted for Post-Feasibility Changes

- 💧 Independent estimate from the Corps

- 💧 Used combination of proprietary tools and Timberline<sup>®</sup> estimating software

- 💧 Used some estimates from HMG and others

- 💧 Estimated “soft costs” as percents of construction

### 💧 Updated the estimate in late 2015/early 2016

# Cost Estimate – Production Rates - Scrapers

## Scraper Production Analysis

Project Name	Fargo Channel / Clay Excavation
Date	10/24/2012

Distance (ft) <b>ONE WAY</b>	Road type (use dropdown menu)	Grade Resistance (%)	Rolling Resistance (%)	Total resistance out.	Total resistance in.
200	Earth, moderate mud	7.00%	9%	16%	2%
500	Earth, well maintained	7.00%	4%	11%	-3%
500	Earth, well maintained	7.00%	4%	11%	-3%
200	Earth, moderate mud	7.00%	9%	16%	2%
1400					

Step 3- Enter Cycle Time Parameters (use dropdown menus)

Summary	
Total Scrapers	20.00
Operator Efficiency	Average
Site Conditions	Wide Open
Weather Conditions	Average
Productive Minutes per hour	53.00
Production per scraper per hour	138.86
Total Production per hour	2,777.14
Hours per day	10.00
Daily Production	27,771.43
Rounds per hour	4.57
Minutes Per Round	13.14
Total Days	2,808.64





# Cost Estimate – Production Rates – Channels

W.P. 01 Outlet and Reach 1	
Total Labor hours	5,454 crew-hrs
Crew size	1 crews
Hours per day	10 hrs/day
Crew days	545.4 crew days
Crews needed	<b>3 crews</b>
Crew days	182 days all crews
Ancillary Crew days %	20%
Total Work days	218 days all crews
Working days per month	22 days/mo
Months of work	9.92 mo
Lineal feet of trench	19550 lf
Production per day	90 lf/day

# Summary of Construction Scope Changes

💧 In-Town

💧 OHB

💧 Channel

# Changes since 2012 Estimate – In Town Levees

💧 2012 Estimate - \$38M      2016 Estimate - \$152M

💧 Primary Reason: USACE Risk and Reliability “Freeboard” Requirements

*Land Increased \$26M*

💧 Residential increased from \$1M to \$7M

💧 Number of homes increased from 3 to 15 due to adding ElZagal and Mickelson to project

💧 Commercial lands increased from \$14M to \$34M

💧 Geotechnical requirements for the 2nd St flood wall resulted in additional property needs

💧 Appraisals and relocation requirements resulted in additional property needs

# Changes since 2012 Estimate – In Town Levees

💧 2012 Estimate - \$38M      2016 Estimate - \$152M

Construction Increased by \$78M

- Flood wall and pump stations increased from \$14M to \$79M
  - 💧 Geotechnical requirements required moving the floodwall west which resulted in extensive changes
  - 💧 Corps freeboard analysis required additional levees and pump stations
  - 💧 Recertification requirements for 4<sup>th</sup> St Pump Station required it to be included in the Diversion Project
  - 💧 Updated NOAA rainfall data required larger pump stations
- Utility relocations cost \$7M
  - Extent of utilities was unknown at time of 2012 estimate
- El Zagal and Mickelson were added to the projects as a result of the Corps freeboard analysis

# Changes since 2012 Estimate – 0HB Levee

2012 Estimate - \$64M                      2016 Estimate - \$126M

Primary Reasons: Keep Oxbow viable and protect the Kindred School District tax base

## *Land Increased \$50M*

Residential increased from \$21M to \$42M

- Home reconstruction costs higher than initially estimated – 2012 estimate based on 130% of assessed value plus \$11,000 for relocation
- Higher home construction costs due to regional market conditions
- High percentage (over 80%) of homes rebuilt
- Housing of last resort requirements

Agricultural lands increased from \$2M to \$10M

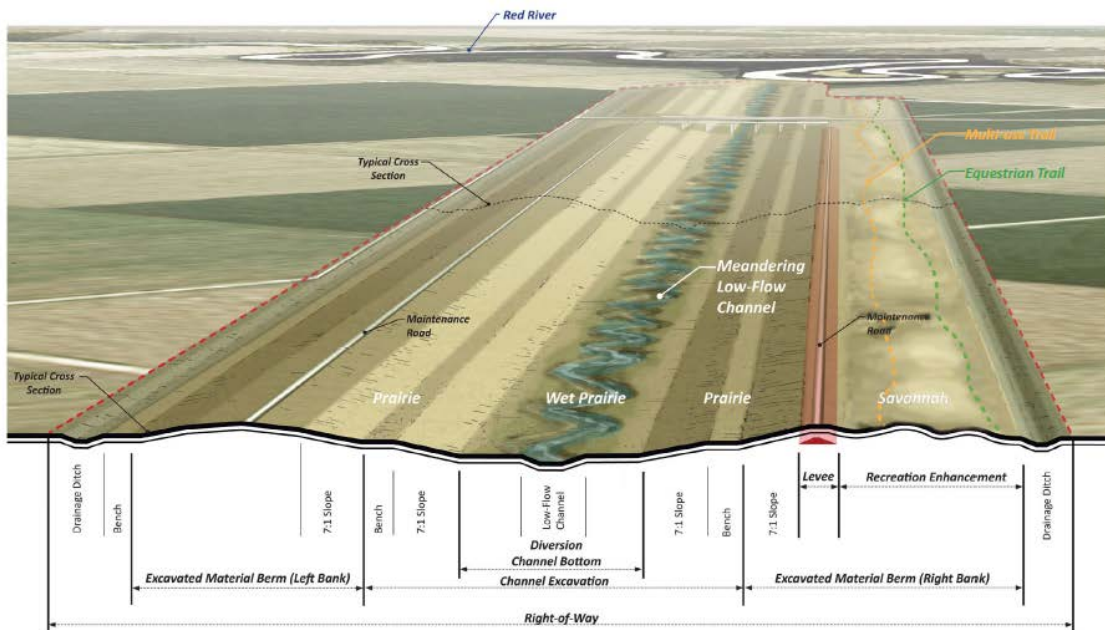
Business relocation increased from \$10M to \$28M

## *Construction Increased by \$10M*

- Storm water ponds and pump station increased from \$6M to \$10M
- Levee increased from \$6M to \$8M
- Utility relocations increased to \$4M

# Changes since 2012 Estimate - Channel

- 2016 Estimate Reduced by \$52M due to:
  - Earthwork decreased by \$17M
    - Channel width decreased south of I-94 from 300 ft bottom width to 220 ft
    - Earth work reduced from 51M cy to 46M cy
  - Diesel fuel (28,000,000 gal) costs reduced by \$35M



# Cost Estimate – Lands and Easements

- 💧 Average cost/acre increased
- 💧 Increased requirements for NDSWC permit
- 💧 Additional In town freeboard requirements
- 💧 Preserve OHB
- 💧 Relocation costs for business and residential

	Total
Land & Structures	\$278M
Construction Easements - Temporary	\$2M
Flowage Easement	\$47M
Relocation	\$31M
Administration / Legal	\$43M
<b>Total</b>	<b>\$401M</b>



# Changes since 2012 Estimate – Soft Costs

2012 Estimate - \$230M

2016 Estimate - \$328M

## Primary Reasons:

USACE Management Costs \$28M

Legal and Financial \$18M

Retention Funding Commitment \$25M

Permitting \$23M

# Cost Estimate – P3 Considerations

- 💧 Reduced separate procurements and contracts in the Diversion Channel and bridges from more than 25 contracts to a single contract
  - 💧 Reduces contractor overhead costs
  - 💧 Reduces mobilization and de-mobilization costs
  - 💧 Shortens schedule by 2 years or more
- 💧 Estimate considers anticipated cost reductions from market-driven innovative approaches and optimization of capital and O&M costs

# Total project costs developed through a probabilistic approach

- 💧 Start with Base Costs
- 💧 Develop Contingency
  - 💧 Risk
  - 💧 Opportunity
- 💧 Factor in P3 Innovation
- 💧 Use Monte Carlo analysis to develop a range of probable project costs

# Contingency developed from anticipated project risk

## 💧 Main Channel

- 💧 Soil swell factor assumption. Currently using 30% swell factor, could range from 20% to 40%
- 💧 Storm event causes site shutdowns
- 💧 Unforeseen site conditions, sand lenses may exist
- 💧 Availability of aggregate base
- 💧 28,000,000 gallons of diesel fuel required – prices may return to 2012 rates or higher

# Contingency developed from anticipated project risk

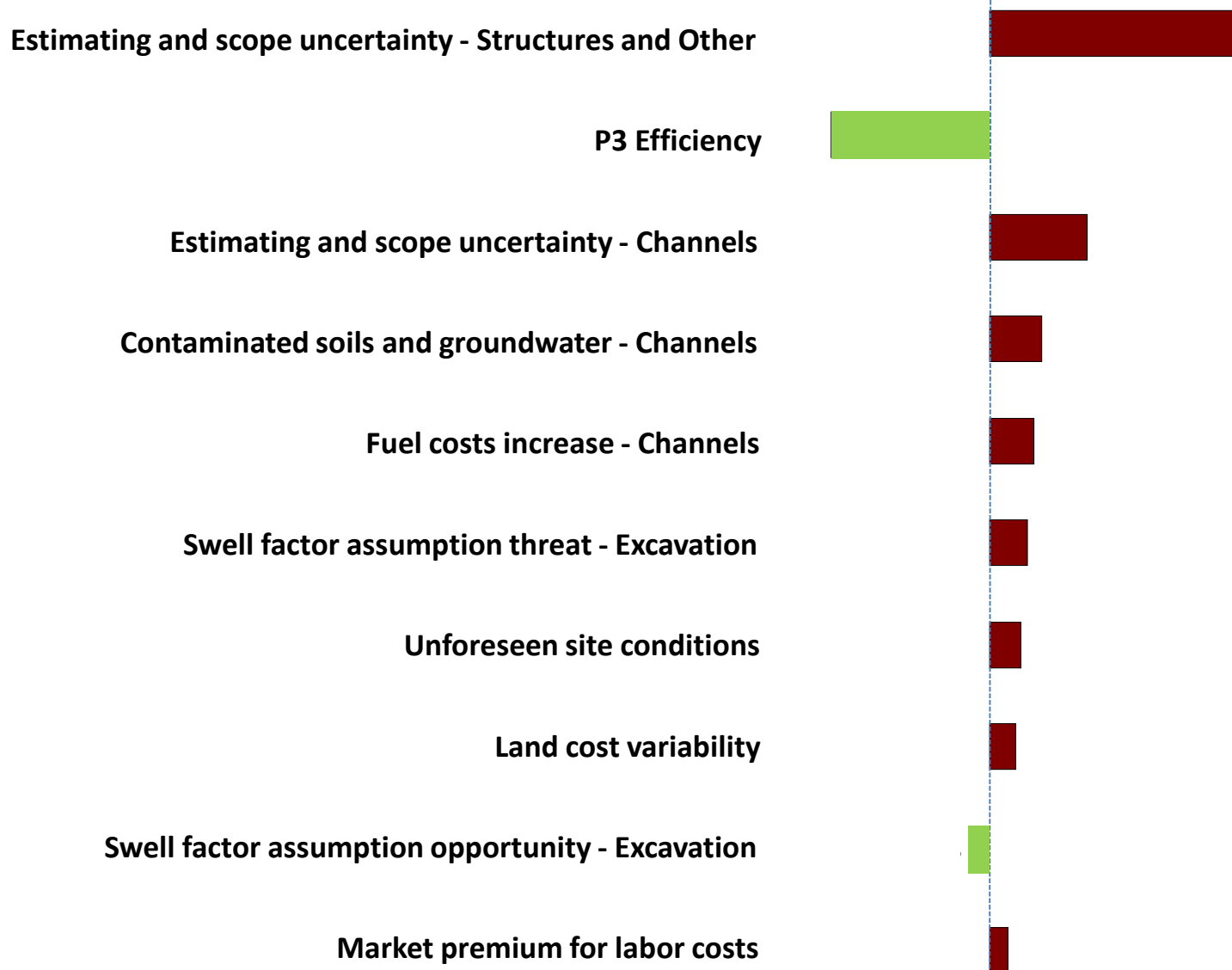
## 💧 Main Channel plus:

- 💧 Ready mix availability, on-site batching, market adjustments
- 💧 Rebar availability, market adjustments
- 💧 Traffic control mitigation measures are more challenging than anticipated
- 💧 Gate pricing is of concern, due to size of gates
- 💧 Availability of rip-rap

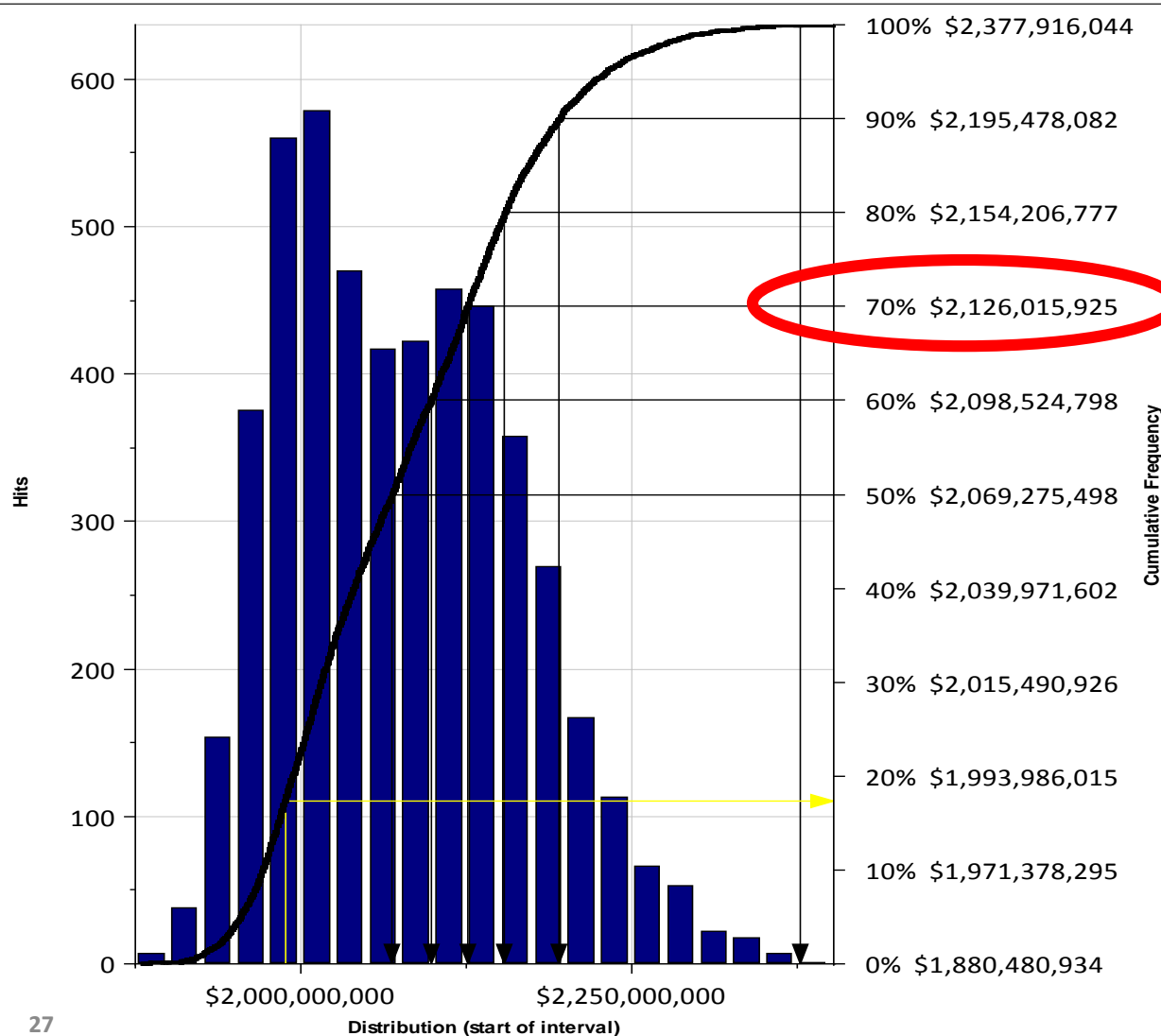
# Risk Register Example

ID	Type	Risk Description	Probability of Occurrence	Most Likely Cost Impact (\$)	Cost Basis
1	Threat	Swell factor assumption currently using 30% swell factor. Ranges stated from 20% to 40%.	L	30,000,000	Base estimate uses 30% swell. For risk item, use difference from 30% to 40% in swell factor = \$30M.
2	Threat	Storm event causes site shutdowns.	VH	8,400,000	Assume 5 crews working full time all delayed by \$12,000/day. 5 crews x \$12,000/day x 20 days/year x 7 years = \$8.4M.
3	Threat	Unforeseen site conditions, sand lenses may exist.	M	15,000,000	1.5% of 60M yards = 1M yards. 1M yards x \$15/yd = \$15M.

# Relative Importance of Risks and Opportunities Affecting Costs



# Range of Probable Project Costs Developed through Monte Carlo Analysis



Data	
Cost of:	Entire Plan
Analysis	
Iterations:	5000
Statistics	
Minimum:	\$1,880,480,934
Maximum:	\$2,377,916,044
Mean:	\$2,077,035,049
Bar Width:	\$25,000,000
Highlighters	
Deterministic (\$1,988,094,040)	17%
50%	\$2,069,275,498
60%	\$2,098,524,798
70%	\$2,126,015,925
80%	\$2,154,206,777
90%	\$2,195,478,082
100%	\$2,377,916,044



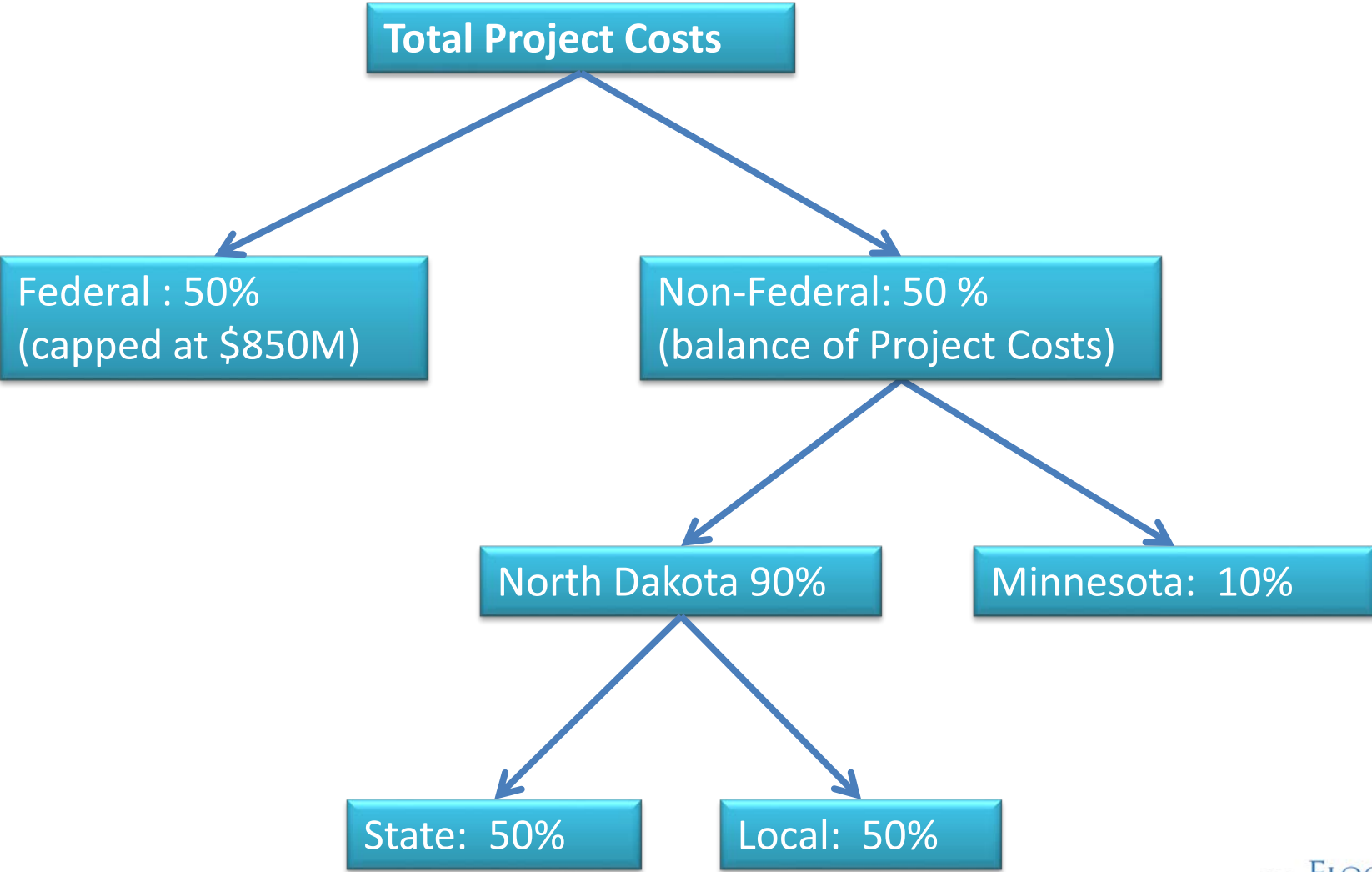
# 2016 Estimate Update

	<b>2016 Estimate Update (million \$)</b>
<b>Construction</b>	<b>\$1,201</b>
<b>Channel</b>	\$349
<b>Bridges &amp; Structures</b>	\$699
<b>Mitigation (OHB &amp; In-Town Levees)</b>	\$153
<b>Land</b>	<b>\$401</b>
<b>Soft Costs</b>	<b>\$328</b>
<b>Program Management and Technical Assistance</b>	\$99
<b>Design, Permitting, and SDCs</b>	\$128
<b>Financial and Legal</b>	\$20
<b>Other (Retention, USACE, Outreach, etc.)</b>	\$81
<b>Contingency Risk/P3 Opportunity</b>	<b><u>\$196</u></b>
<b>Total</b>	<b>\$2,126</b>

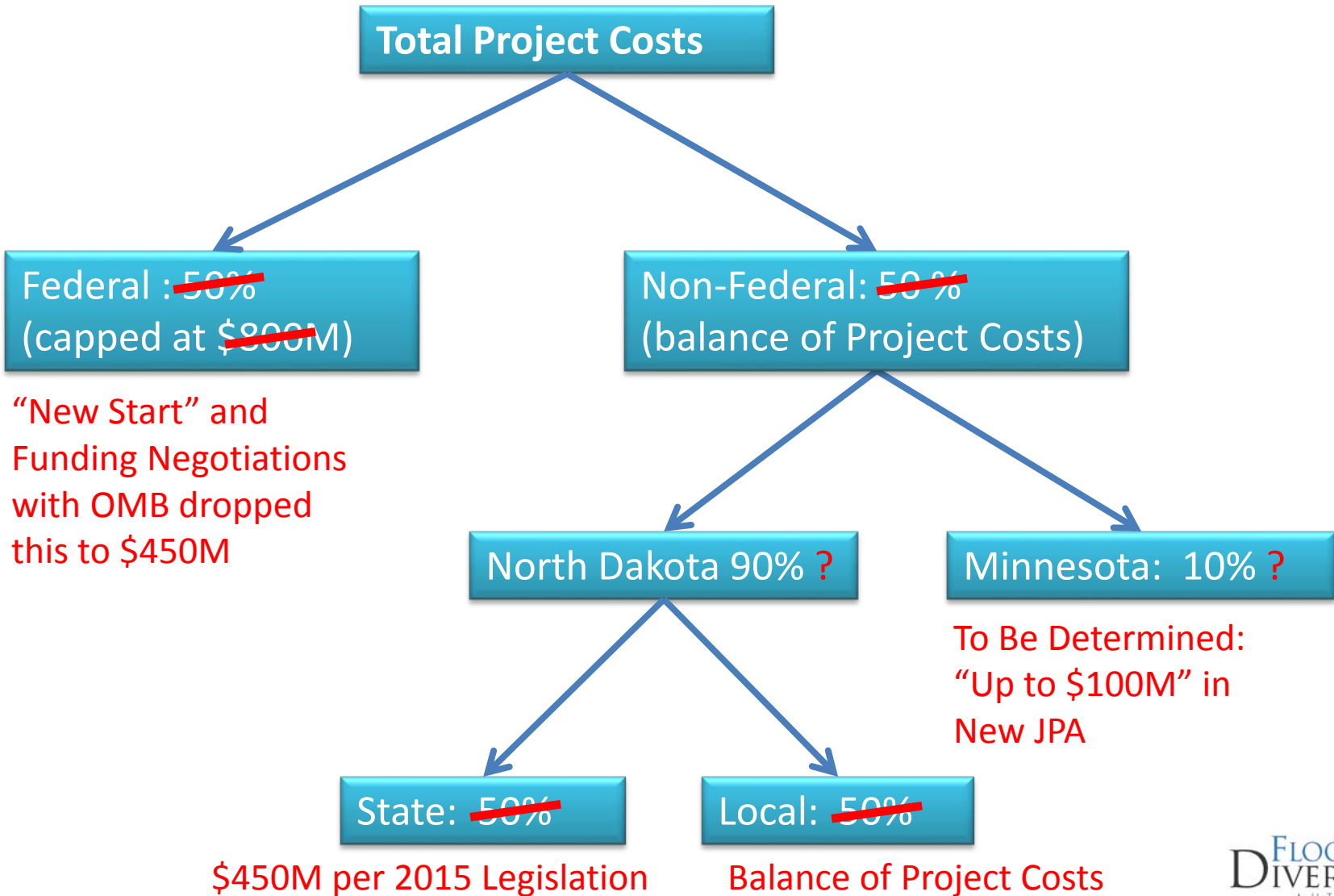
# Presentation Outline

- 💧 Background Information about Costs and Funding
- 💧 Inform the DA Entities about the current Project Cost Estimate
- 💧 **Assumptions for Financial Plan**
- 💧 Q&A

# 2011 Stakeholders and Funding Assumptions



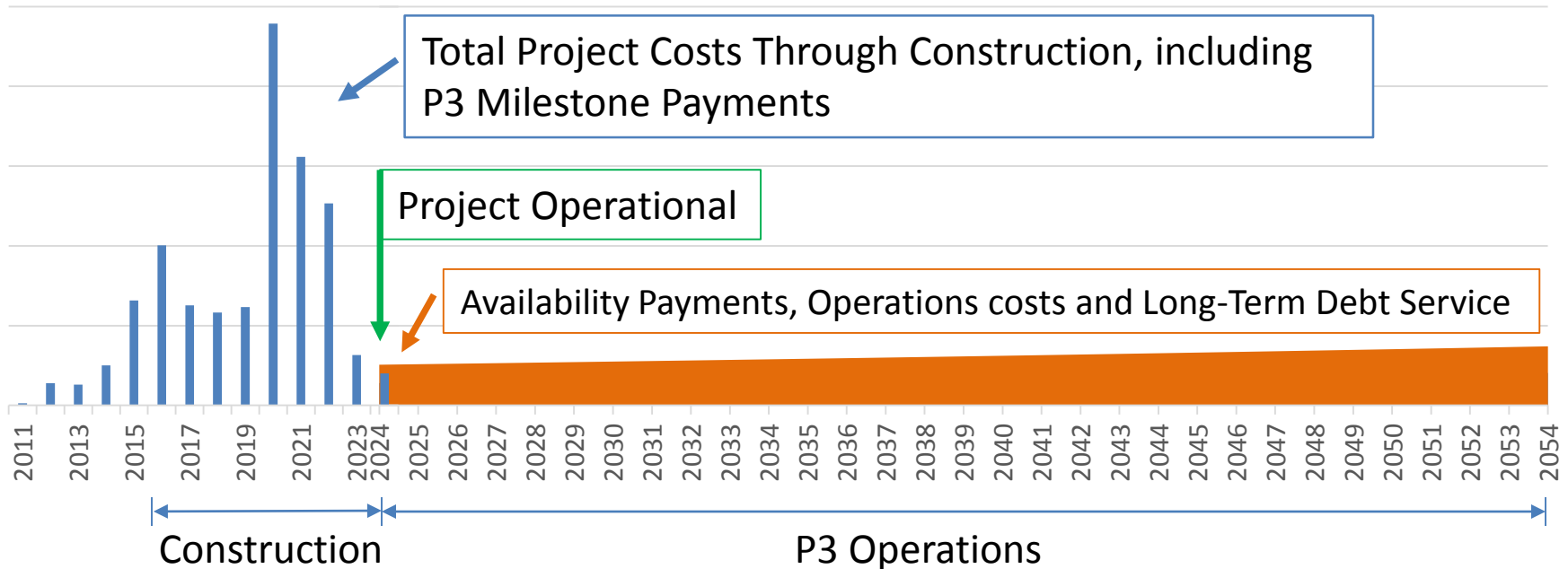
# 2016 funding allocations



# 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
- Public Financing (Short and Long-Term)
- Sales Tax Revenues
- P3 Financing (Debt & Equity)



# What is next?

- 💧 Value Engineering Workshop

- 💧 Financial Plan Development and Rollout

# Presentation Outline

- 💧 Background Information about Costs and Funding (Nicholson)
- 💧 Inform the DA Entities about the current Project Cost Estimate (Spiller)
- 💧 Assumptions for Financial Plan (Nicholson)
- 💧 **Q&A**