

# NDOT Five Year Capital Plan

*Developing Transparent Project Priorities*



# Agenda

- Introductions
- Capital Plan Vision
- Overview
  - NDOT Partnership with Decision Lens
  - Team Approach to the 5 Year Capital Plan
- Demonstration

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# Capital Plan Vision

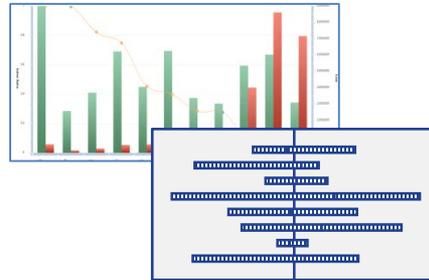
*Building on the NDOT's current 5-Year Plan, Decision Lens will enable NDOT to create an integrated and defensible Plan forming a transparent and efficient cross functional decision support framework.*

## Program Prioritization



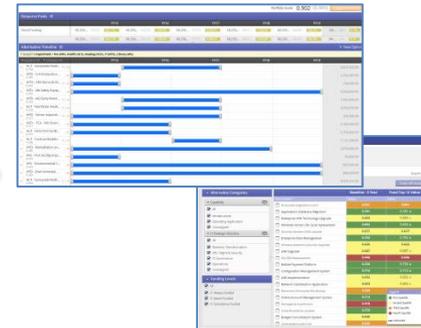
*Division Level*

## Layering in Costs & Risks



*Portfolio Level*

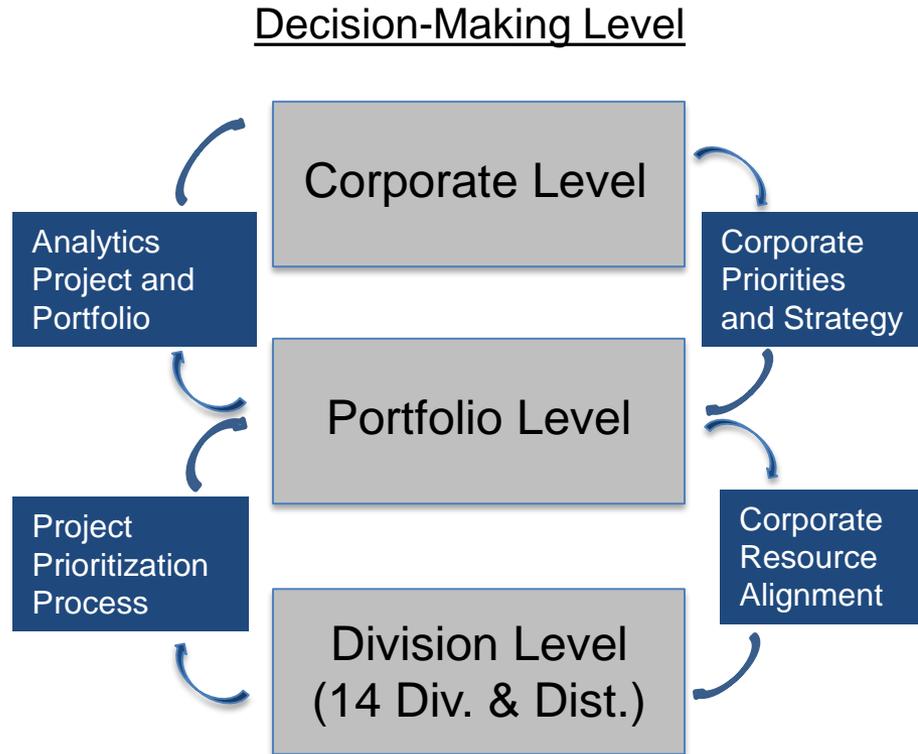
## Funding Strategy and Project Sequencing



*Corporate Level*

*Risk Consultant  
Quantification*

# How it will work within the organization



## Key Questions for Analysis

- Of the portfolio, which projects further the Board's priorities?
- How do we best allocate funding across programs?
- What is the best sequencing of projects?
- How do you address equity concerns (eg. urban vs rural)
- Which feasible projects across various programs will meet NDOT's performance measures while managing risks?
- Which projects provide the greatest Value Return on Investment (more than just benefit/cost)?
- What resource needs are required for each project?

*This bottom-up and top-down approach will provide NDOT with the greatest Return on Investment with respect to agency, State, and stakeholder priorities*

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# Decision Lens – Transportation Partners



# Team Approach Builds on NDOT Priorities

*Funding Strategy  
Project Sequencing*

*Feasibility Analysis  
Benefit-Cost Ratios  
Allocation Spread*

*Project Rollup  
Cost Estimates*

Corporate Level  
Analysis

Portfolio Level  
Analysis

**Division Level Prioritization**

**Sample C-Level Criteria:**  
Director/Community/Board's Priorities, Geography, Economic Growth, Political Risk, Funding distribution

**Sample PDC-Level Criteria:** Org Performance Measures, Feasibility, Schedule, Cost, known Funding, MAP-21

**Sample Division-Level Criteria:** Technical Data, Division-specific Requirements, resource constraints, MAP-21



# Key Benefits of Team Approach

- Expands on the existing NDOT 5-year plan with collaboration from all levels of NDOT
- Develops a dynamic and flexible prioritized cross functional project list that allows for quick assessment of investment tradeoffs
- Provides real-time budget allocation “what if’s” that can be conducted at the corporate and cross functional levels
- Integrates state priorities into planning process using data-driven analysis coupled with expert judgment
- Facilitates the effective, efficient, and transparent discussions as to how spend the “last dollar” as budgets increases and/or decreases

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# Building Scenarios to reflect reality

What if...

- “Fiscal Cliff” causes Congress to reduce amount of fed transportation funds that NDOT must obligate
- Congress increases the amount of federal transportation funds

# Live Demonstration

DEMO

# Back Up Slides

# Flexible Prioritization

Sample Transportation (AASHTO) 2 - Jonathan Allen (Facilitator)

**Criteria Tree**

- ▶ Criteria Weights Inputs
- ▶ Alternative Ratings Inputs
- ▼ Alternative Categories
  - ▶ District 13/13
  - ▼ Project Type 11/11
    - All
    - Bridge
    - Bridge & Mobility
    - Bridge & Pavement
    - Bridge & Safety
    - Mobility
    - Pavement
    - Pavement & Mobility
    - Pavement & Safety
    - Safety
    - Transit
    - Unassigned
  - ▼ Functional Class 4/4
    - All
    - NHS Interstate
    - NHS Non-Interstate
    - Non-NHS
    - Unassigned

Criteria	Name	Value
	Safety	15.6 %
	Bridge Condition	19.8 %
	Pavement Condition	18.2 %
	Congestion Reduction	8.7 %
	System Reliability	7.8 %
	Freight Movement & ...	14.1 %
	Environmental Sustai...	2.5 %
	Reduced Project Deliv...	6.5 %
	Transit Performance	6.9 %

**Alternatives** Hold 'Control' key while hovering over segments to toggle isolation mode.

Name	Value
Interstate 76 Add Lane Capacity	0.449
New Transit Service	0.442
Interstate 10 Bridge Replacement and Widening	0.394
Red Transit Line Service Expansion	0.381
Interstate 80 Bridge & Roadway Reconstruction	0.346
Interstate 76 Roadway and Bridge Reconstruction Eastbound	0.316
Interstate 70 Roadway and Bridge Reconstruction Westbound	0.283
Interstate 70 Pavement Rehabilitation and Shoulder Widening	0.242
Interstate 280 Bridge Seismic Retrofit	0.223
State Road 43B Bridge Replacement	0.217
Interstate 80 ITS Deployment	0.210
Interstate 225 River Bridge Repair	0.210
Transit Stock Replacement	0.206
Interstate 5 Rehabilitation and Rumble Strip Installation	0.192
State Road 101 River Bridge Reconstruction	0.187
Interstate 270 Bridge and Roadway Repair	0.182
State Road 395 Bridge and Roadway Repair	0.181
Interstate 5 Major Rehabilitation	0.180
State Road 50 Bridge over Interstate 80 Repair	0.168
Interstate 5 River Interchange Bridge and Roadway Repair	0.165
State Road 101 Bridge Replacement B	0.154
State Road 40 Pavement Resurfacing	0.150
State Road 99 Bridge Structural Repair	0.149
Interstate 305 Resurfacing	0.144

# What-if Analysis

Sample Transportation (AASHTO) 2 - Jonathan Allen (Facilitator)

**Criteria Tree**

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  - ▼ Project Type 11/11
    - All
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    - Bridge & Mobility
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    - Mobility
    - Pavement
    - Pavement & Mobility
    - Pavement & Safety
    - Safety
    - Transit
    - Unassigned
  - ▼ Functional Class 4/4
    - All
    - NHS Interstate
    - NHS Non-Interstate
    - Non-NHS
    - Unassigned

**Criteria**

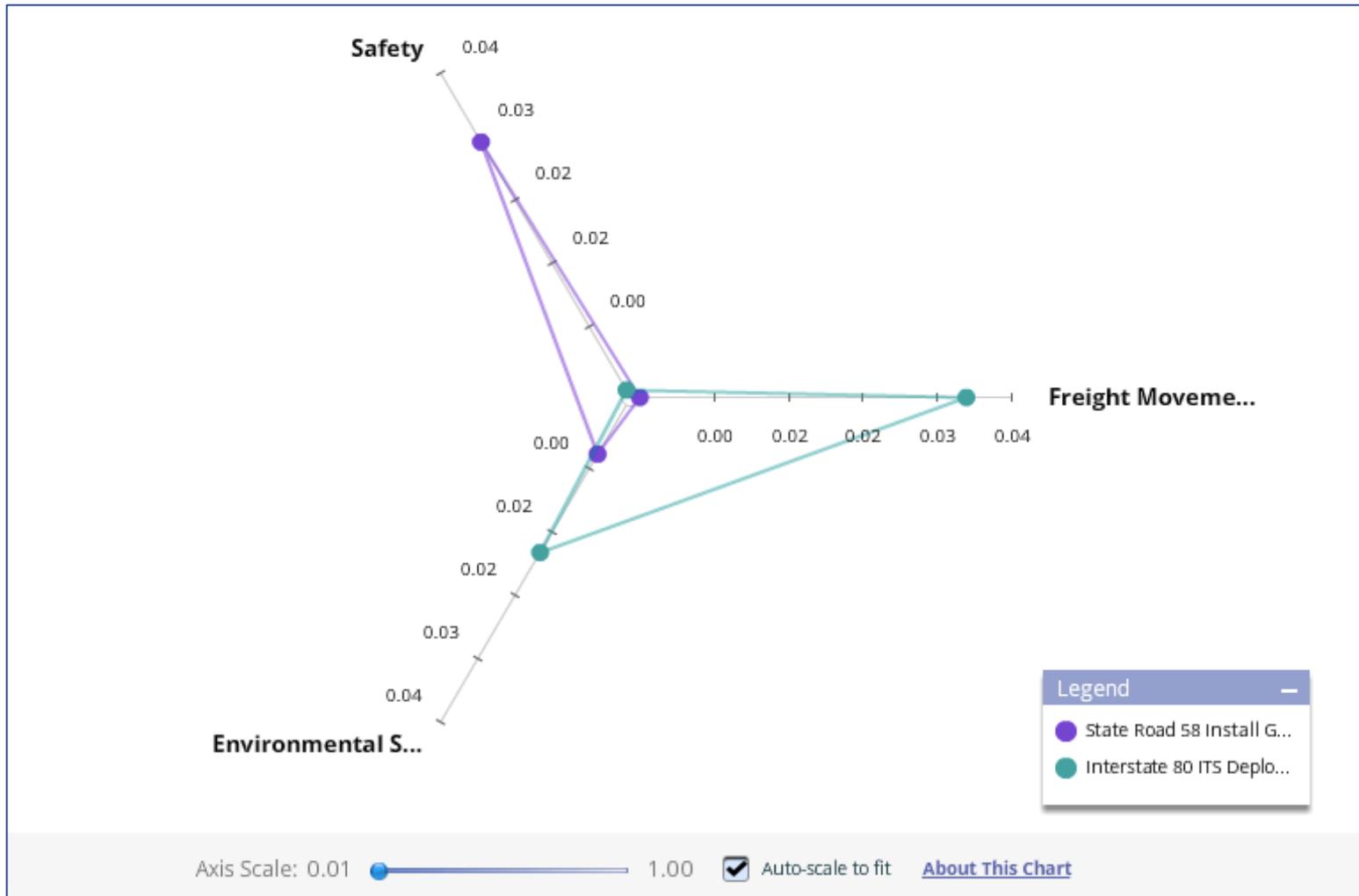
Name	Value	
Safety	18.5 %	
Bridge Condition	5 %	
Pavement Condition	21.5 %	
Congestion Reduction	10.3 %	
System Reliability	9.2 %	
Freight Movement & ...	16.7 %	
Environmental Sustai...	2.9 %	
Reduced Project Deliv...	7.7 %	
Transit Performance	8.2 %	

**Alternatives**

Hold 'Control' key while hovering over segments to toggle isolation mode.

Change	Name	Value	
	Interstate 76 Add Lane Capacity	0.531	
	New Transit Service	0.523	
+1	Red Transit Line Service Expansion	0.451	
-1	Interstate 10 Bridge Replacement and Widening	0.376	
	Interstate 80 Bridge & Roadway Reconstruction	0.319	
+2	Interstate 70 Pavement Rehabilitation and Shoulder Widening	0.287	
-1	Interstate 76 Roadway and Bridge Reconstruction Eastbound	0.283	
+3	Interstate 80 ITS Deployment	0.249	
-3	Interstate 70 Roadway and Bridge Reconstruction Westbound	0.244	
+4	Transit Stock Replacement	0.244	
+3	Interstate 5 Rehabilitation and Rumble Strip Installation	0.227	
+6	Interstate 5 Major Rehabilitation	0.213	
+9	State Road 40 Pavement Resurfacing	0.177	
	Interstate 305 Resurfacing	0.171	
+1	Interstate 270 Bridge and Roadway Repair	0.170	
+1	State Road 395 Bridge and Roadway Repair	0.169	
-5	Interstate 225 River Bridge Repair	0.157	
+10	State Road 350 Resurfacing Eastbound	0.150	
+1	Interstate 5 River Interchange Bridge and Roadway Repair	0.150	
+9	State Road 58 Install Guardrail & Slope Stabilization	0.149	
-11	State Road 43B Bridge Replacement	0.135	
+1	State Road 99 Bridge Structural Repair	0.130	
-4	State Road 50 Bridge over Interstate 80 Repair	0.123	

# Tradeoff Analysis



# Force Fund I-76

Sensitivity Analysis ▶ Trade Off Analysis ▶ Allocate ▶ Visualize Scenario: **Current Funding - Force Fund I-76**

Input Pools & Costs

**Resource Pools** Add Pool ⓘ

+ Add Time Period 2016 2017 2018 2019

**Alternative Costs** Dependencies ⓘ Interstate 76 ✕ View Options

Expand All		2016	2017	2018	2019	
+ Interstate 76 Roadway...		20,000,000.00	0.00	0.00	0.00	20,000,000.00
- Interstate 76 Add Lane...		5,500,000.00	5,500,000.00	5,500,000.00	0.00	16,500,000.00
NHPP		1,000,000.00	1,000,000.00	1,000,000.00		3,000,000.00
HSIP		0.00	0.00	0.00		0.00
CMAQ		2,000,000.00	2,000,000.00	2,000,000.00		6,000,000.00
State Discretionary		2,500,000.00	2,500,000.00	2,500,000.00		7,500,000.00
<b>Total Requested</b>		<b>90,750,000.00</b>	<b>60,250,000.00</b>	<b>50,250,000.00</b>	<b>52,250,000.00</b>	<b>253,500,000.00</b>

# Value per dollar for projects in Dist 4



# Spend the last dollar via add'l funding

**Additional Funding**  
Optimized portfolio assuming another \$10M per year added to NHPP

**Current Funding**  
Optimized allocation of state and federal funds

Scenario Overview    **What's In/What's Out**    Export:

List View    Quartiles List    Quartiles Grid    Trade Off Analysis

**Alternative Categories**

▼ District 1/13

- All
- District 1
- District 10
- District 11
- District 12
- District 2
- District 3
- District 4
- District 5
- District 6
- District 7

		Additional Funding		Current Funding	
Based On District > District 4					
Alternatives	Value (Rank)	Cost	Value (Rank)	Cost	
<input type="checkbox"/> New Transit Service	0.442 (2)	3,500,000.00	0.442 (2)	3,500,000.00	
<input type="checkbox"/> State Road 101 Bridge Replacement B	0.154 (21)	6,000,000.00	0.154 (21)	6,000,000.00	
<input type="checkbox"/> Interstate 280 Bridge Seismic Retrofit	0.223 (9)	7,250,000.00	0.223 (9)	7,250,000.00	
<input type="checkbox"/> Interstate 76 Roadway and Bridge Reconstruction Eastbound	0.316 (6)	20,000,000.00	0.316 (6)	20,000,000.00	
<input type="checkbox"/> Interstate 76 Add Lane Capacity	0.449 (1)	25,500,000.00	0.449 (1)	25,500,000.00	
<input type="checkbox"/> Interstate 80 Bridge & Roadway Reconstruction	0.346 (5)	27,000,000.00	0.346 (5)	27,000,000.00	