

Risk-Based Asset Management Programs can catalyze ERM



RISK

REWARD

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Experience**



MnDOT's Risk-Based Asset Management Plan Lessons

How Risk-Based Asset Management Programs can Catalyze ERM

1:00 P.M. - Tuesday, August 25, 2015

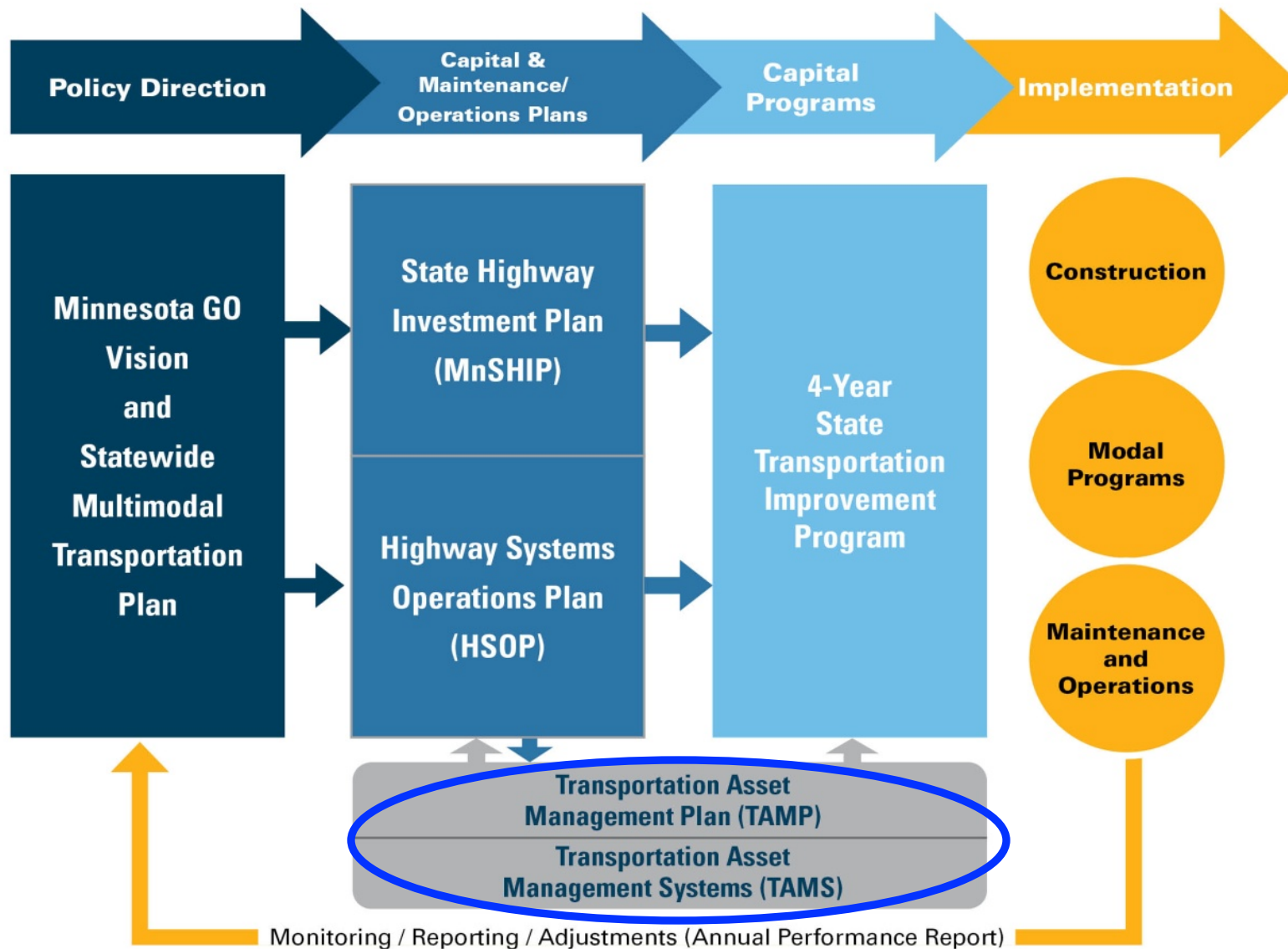


Presentation Format

- Asset Management Planning Framework
- MnDOT Risk Framework (including TAMP)
- MnDOT Asset Performance
- TAMP Lessons

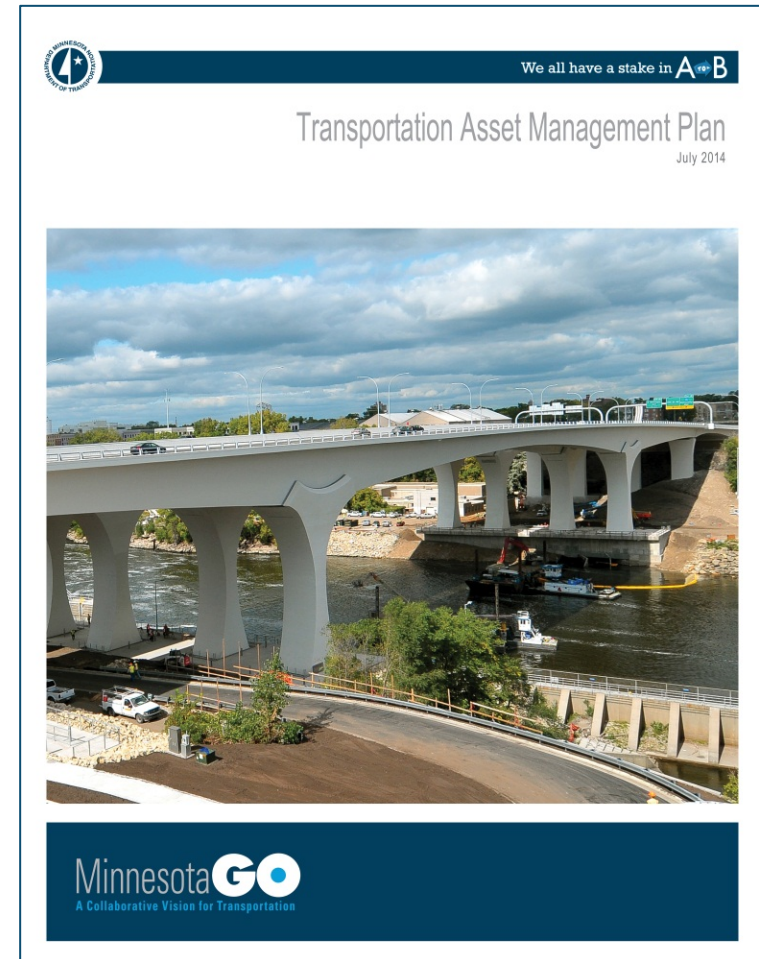


Planning Framework



TAMP Components

- Asset Inventory & Conditions
- Risk Analysis
- Life Cycle Cost Analysis
- Performance Measures & Targets
- Performance Gap Assessment
- Financial Plan & Investment Strategies
- Implementation & Next Steps



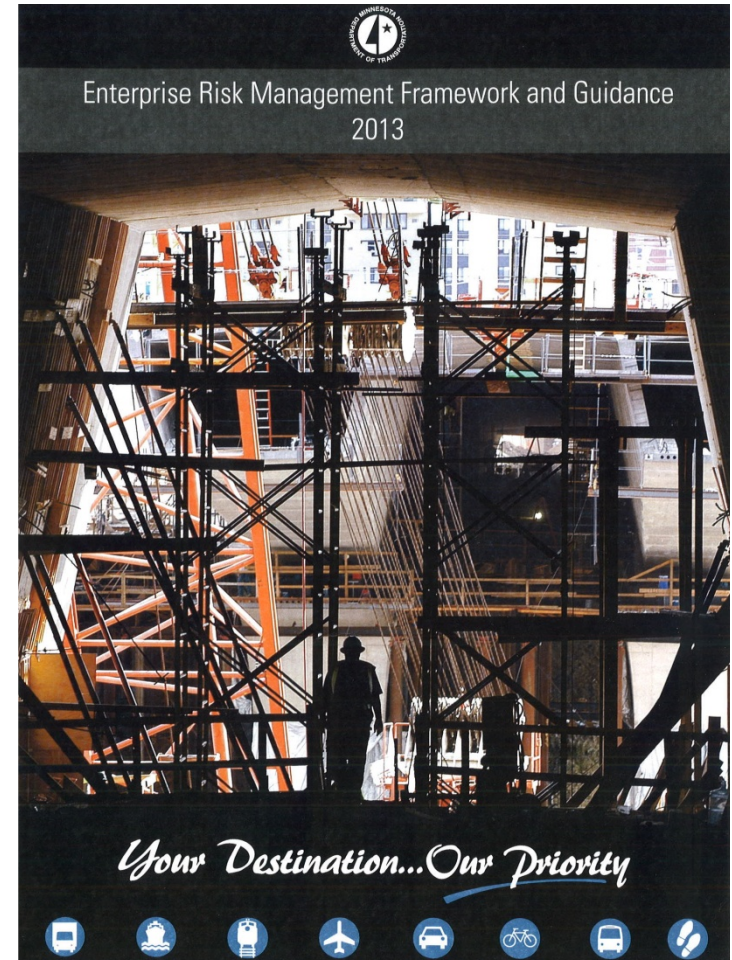
Risk Management Analysis

- Risk Management at MnDOT
 - Enterprise Risk Management
 - 20-year State Highway Investment Plan (MnSHIP)
 - 4-year Highway Systems Operations Plan (HSOP)
 - Bridge Management (BRIM)
 - Pavement Management (HPMA)
- MnDOT's TAMP Risk Assessment process
 - "Global Risks"
 - "Undermanaged Risks"
 - Prioritization of mitigation strategies



Risk Management Analysis

- Enterprise Risk Management

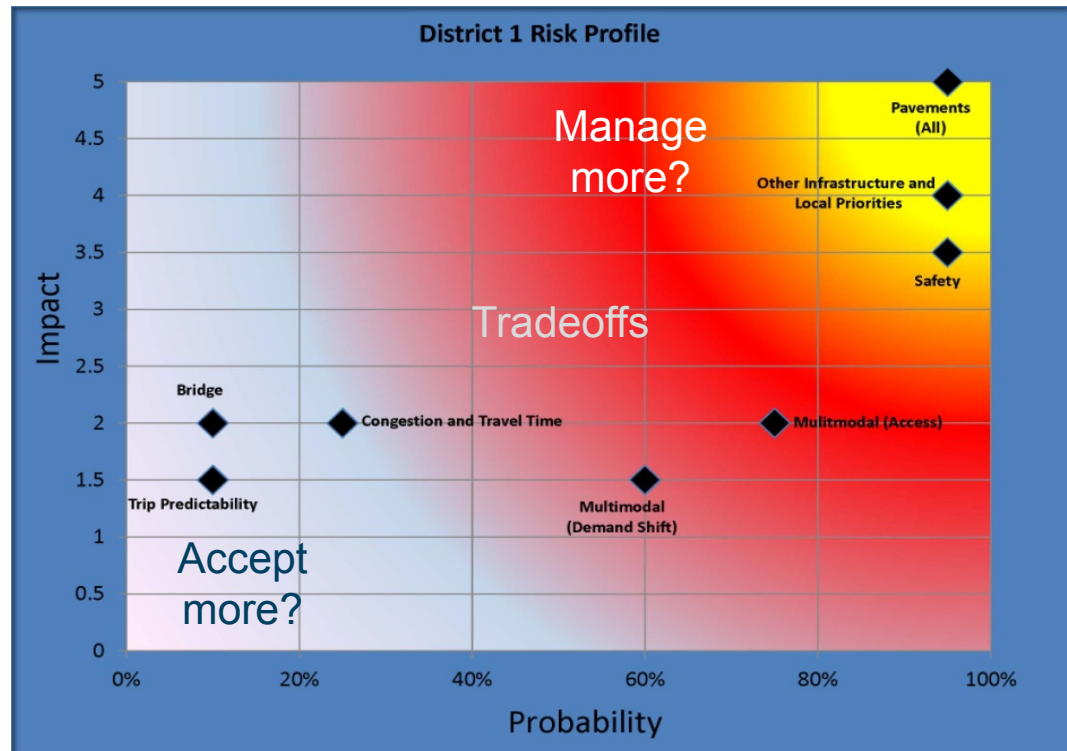
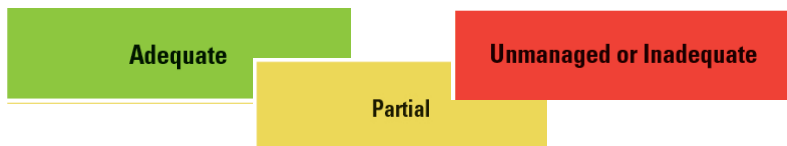


Risk Management Analysis

MnSHIP

- Used risk as a lens, building on the 2010 Risk Profiles and focusing on 10 investment categories and risk to assess Plan investment direction

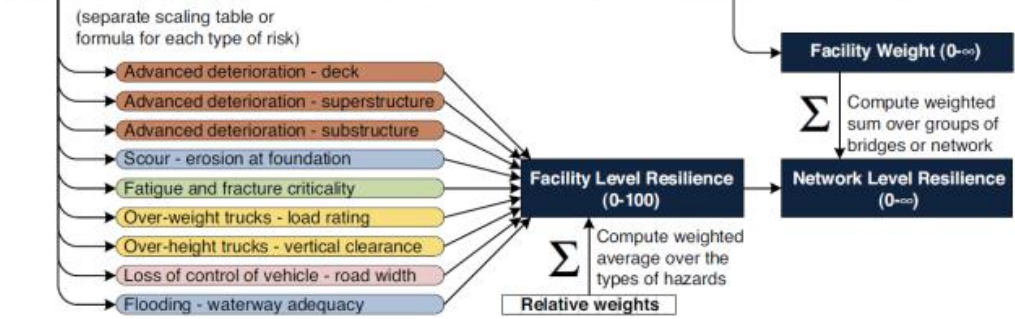
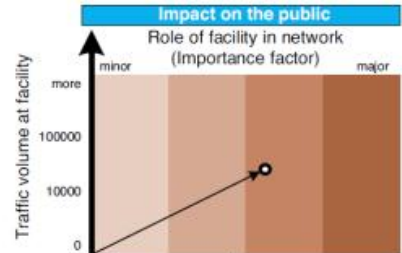
Key Capital Investment Risks	Mitigated Risk Through Year 10	Mitigated Risk Through Year 20
GASB 34: pavement and bridge conditions deteriorate, jeopardizing state bond rating		
Federal policy: failure to achieve MAP-21 performance targets on NHS reduces funding flexibility		
MnDOT policy: misalignment with Vision and Statewide Multimodal Transportation Plan results in loss of public trust		
Bridges: deferring bridge investments viewed as an unwise/unsafe strategy		
Responsiveness: rigid investment priorities limits ability to support local economic development and quality of life opportunities		
Operations budget: untimely or reduced capital investment leads to unsustainable maintenance costs		
Public outreach: investment inconsistent with MnSHIP public outreach results in loss of public trust		



Risk Management Analysis

- Bridge and Pavement Management (BRIM/HPMA)
 - HPMA helps meet GASB 34 min. condition thresholds and risks associated with HPMA are identified in MnDOT's ERM risk register
 - BRIM used to identify, evaluate, and plan for a variety of quantifiable risks that apply to bridges

Likelihood of hazard	Consequence to structure					
	None	Tiny	Low	Medium	High	Extreme
0%	100	100	100	100	100	100
10%	100	100	95	95	85	85
20%	95	95	90	90	80	80
30%	90	90	85	85	75	75
40%	75	75	70	70	55	55
50%	55	55	50	50	35	35
60%	35	35	30	30	20	20
70%	20	20	15	15	10	10
80%	10	10	5	5	0	0
90%	5	5	5	5	0	0
100%	0	0	0	0	0	0




Risk Management Analysis

- TAMP Process included Identifying, Assessing, and Managing Asset Specific Risks

- Impacts to assets, public, agency

- Risk Evaluation Process

- Likelihood/consequence of occurrence

		Likelihood Ratings and Risk Levels				
		Rare	Unlikely	Possible	Likely	Almost Certain
Consequence Ratings	Catastrophic	Medium	Medium	High	Extreme	Extreme
	Major	Low	Medium	Medium	High	High
	Moderate	Low	Medium	Medium	Medium	High
	Minor	Low	Low	Low	Medium	Medium
	Insignificant	Low	Low	Low	Low	Medium



Risk Management Analysis

- Process began with focus on “global” risks
 - Natural events or operational hazards
- Transitioned to an emphasis on “undermanaged” risks
 - Areas with clear opportunities for improvement – to better manage assets – as to avoid global risks
- Identification/Prioritization of mitigation strategies



Asset Condition & Performance

- Redefining Targets from MnSHIP to TAMP
- Terminology Moving Forward to Determine Performance Gap
 - **Targets** reflect desired outcomes
 - **Plan outcomes** describe future performance outcomes with MnDOT's fiscally constrained spending priorities
- Connecting Risk and to Asset and Performance Management



Asset Condition & Performance

Pavement Existing & Recommended Condition Targets

System	2012 Condition (% Poor)	MNSHIP		TAMP	
		Target Recommendation (% Poor)	Plan Outcome (% Poor)	Target Recommendation (% Poor)	Plan Outcome (% Poor)
Interstate	2.4 %	≤ 2%	2 %	≤ 2 %	2 %
Non-Interstate NHS	4.3 %	≤ 4%	4 %	≤ 4 %	4 %
Non-NHS	7.5 %	NA	12 %	≤ 10 %	12 %

Bridge Existing & Recommended Condition Targets

System	2012 Condition (% Poor)	MNSHIP		TAMP	
		Target Recommendation (% Poor)	Plan Outcome (% Poor)	Target Recommendation (% Poor)	Plan Outcome (% Poor)
NHS	4.7 %	≤ 2%	2 %	≤ 2 %	2 %
Non-NHS	2.1 %	≤ 8 %	6 %	≤ 8 %	6 %



Asset Conditions & Performance

Highway Culvert & Deep Stormwater Tunnel Existing & Recommended Condition Targets

Asset	2012 Condition	MNSHIP	TAMP	
		Target Recommendation/ Plan Outcome	Target Recommendation	Plan Outcome
Highway Culverts	10 % Poor; 6 % Very Poor	NA	≤ 8 % Poor; ≤ 3 % Very Poor	TBD
Deep Stormwater Tunnels	39 % Poor; 14 % Very Poor	NA	≤ 8 % Poor; ≤ 3 % Very Poor	TBD

Overhead Sign Structures & High-Mast Light Tower Structures Existing & Recommended Condition Targets

Asset	2012 Condition	MNSHIP	TAMP	
		Target Recommendation/ Plan Outcome	Target Recommendation	Plan Outcome
Overhead Sign Structures	6 % Poor; 8 % Very Poor	NA	≤ 4 % Poor; ≤ 2 % Very Poor	TBD
High-Mast Light Tower Structures	6 % Poor; 15 % Very Poor	NA	TBD	TBD



TAMP Lessons

- Development of the TAMP helped justify improvements already being discussed
 - Complete bridge management tools to improve predictions of future conditions
 - Formalize the inspection of overhead sign structures and high-mast light tower structures to help reduce the risk of failure



TAMP Lessons

- TAMP framework served as a proof-of-concept for expanding the scope of future TAMPs for assets without formal management processes in place



TAMP Lessons

- Process of using existing data to develop the TAMP provided insight into the completeness and reliability of the data and a better understanding of the risks associated with undermanaging the assets
 - Potential risk of failure associated with the I-35W South deep stormwater tunnel contributed to MnDOT programming \$12 million to address needed repairs
 - Plan led to the observation that there are many miles of access roads, ramps, frontage roads, and auxiliary lanes that are not currently being monitored and tracked (research underway)



TAMP Lessons

- MnDOT was able to uncover risks associated with undermanaging assets by focusing on risks associated with achieving the performance outcomes that had not previously been at the forefront
 - Need for prediction models to better manage bridges
 - Need for a formal inspection process for overhead sign structures and high-mast light tower structures.





Thank You!

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Or visit

<http://www.dot.state.mn.us/assetmanagement>

