

MAP-21: New Opportunity for Managing Pavements



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Nov. 12 , 2013



MAP-21: New Promise for Pavement Management

- MAP-21 opens an era in which long-term performance and sustainability of the highway system may be considered
- Long over due
- What service affects more people than pavements?





MAP 21: A New Era

- MAP-21 initiates a new era for U.S. transportation agencies focusing on:
 - Performance management
 - Asset management
 - Risk management
- States must develop risk-based, performance-based asset management plans for at least the NHS



MAP-21 Performance Declaration

- Performance management will transform the Federal-aid highway program
- Provide a means to the most efficient investment of Federal transportation funds
- Focus on national transportation goals
- Increase accountability and transparency of the Federal-aid highway program
- Improve decision making through performance based planning and programming.



Asset Management Definition

- Asset management is a strategic and systematic process of operating, maintaining, and improving physical assets
- To identify a structured sequence of maintenance, preservation, repair, rehabilitation, and replacement actions
- That will achieve and sustain a desired state of good repair over the lifecycle of the assets at minimum practicable cost.

Risk Defined

- Risk is the positive or negative effects of uncertainty or variability upon agency objectives.
- Risk management is the cultures, processes and structures that are directed towards the effective management of potential opportunities and threats.



The Complementary Role of Risk

- Risk management complements performance and asset management
- AM and Performance Management seek to ensure reliable, predictable performance
- Risk addresses the unpredictable variables that could impede your asset management or performance management plans
- ‘The best laid plans of mice and men.....’
- Or, stuff happens



A Complementary Process

- Performance and Asset Management seek to ensure reliable, dependable processes and outcomes
- The opposite of reliability is variability
- Risk management seeks to reduce the variability of desired outcomes



Risk Affects Many Areas

- Risk can be anything that may impede an objective or create a new opportunity
 - Economic risks caused by prices
 - Decision risks caused by bad data, information
 - External risks such as climate
 - New opportunities such as new technology, materials or processes



Not All Risks Are Negative

- Risk are more than just threats. They include:
 - Threats
 - Variability
 - Change
 - Uncertainty
 - Opportunity
- This includes risks to achieving objectives, to customer satisfaction to sustaining infrastructure condition and performance



A Focus on Targets, Outcomes

- The focus of the Federal-Aid program expands to include setting and achieving condition and performance goals and targets
- The role of risk management is to inform decision makers why those goals targets may be uncertain in the years ahead



Risk Management Reports

- Reports examine how risk management complements Transportation Asset Management
- They define and illustrate how risk can be applied

Risk-Based Transportation Asset Management:

Evaluating Threats, Capitalizing on Opportunities

REPORT 1: OVERVIEW OF



U.S. Department of Transportation
Federal Highway Administration

Risk-Based Asset Management:

Examining Risk-based Approaches to Transportation Asset Management

REPORT 2: MANAGING RISK LEVELS IN A TRANSPORTATION ASSET



U.S. Department of Transportation
Federal Highway Administration

Risk-Based Transportation Asset Management:

Achieving Policy Objectives by Managing Risks

REPORT 3: RISKS TO ASSET MANAGEMENT POLICIES



U.S. Department of Transportation
Federal Highway Administration

SEPTEMBER 2012

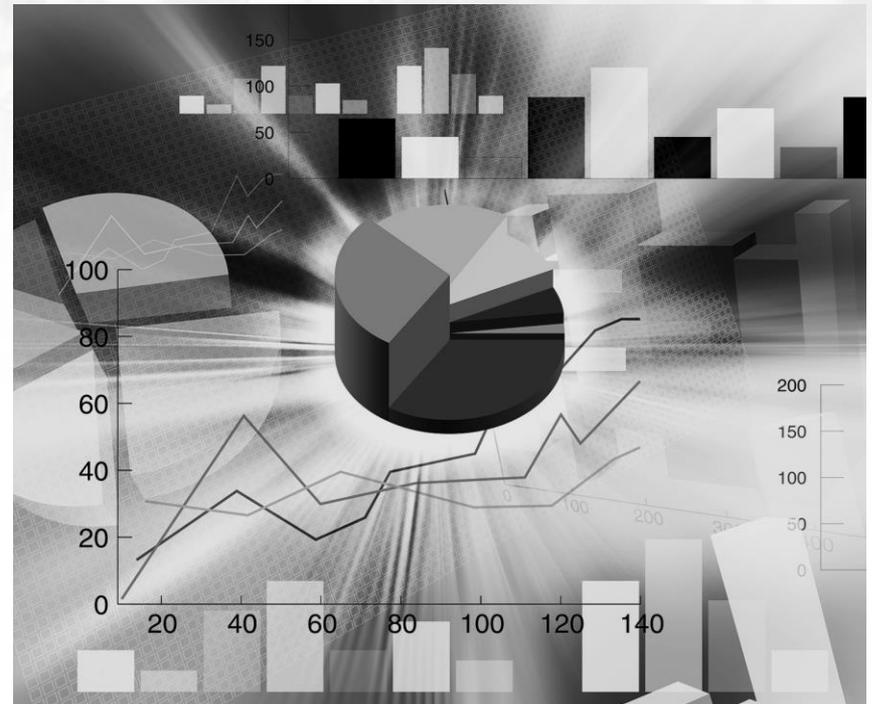


What Are the Scope and Content of a Risk-based Asset Management Plan?

- Includes strategies that lead to a program of projects that would make progress toward achievement of the State targets for asset condition and performance of the NHS
- States must address pavements and bridges but are encouraged to include all infrastructure assets within the highway right-of-way in their risk-based asset management plan. (Also can include roads other than on the NHS.)

The Need to Measure Carefully

- The old say is, ‘what gets measured, gets managed’
- My new saying, ‘Performance measures are like prescription drugs. They can cure or kill you.’
- It all depends on how you chose and use





Potential Problems with Measures

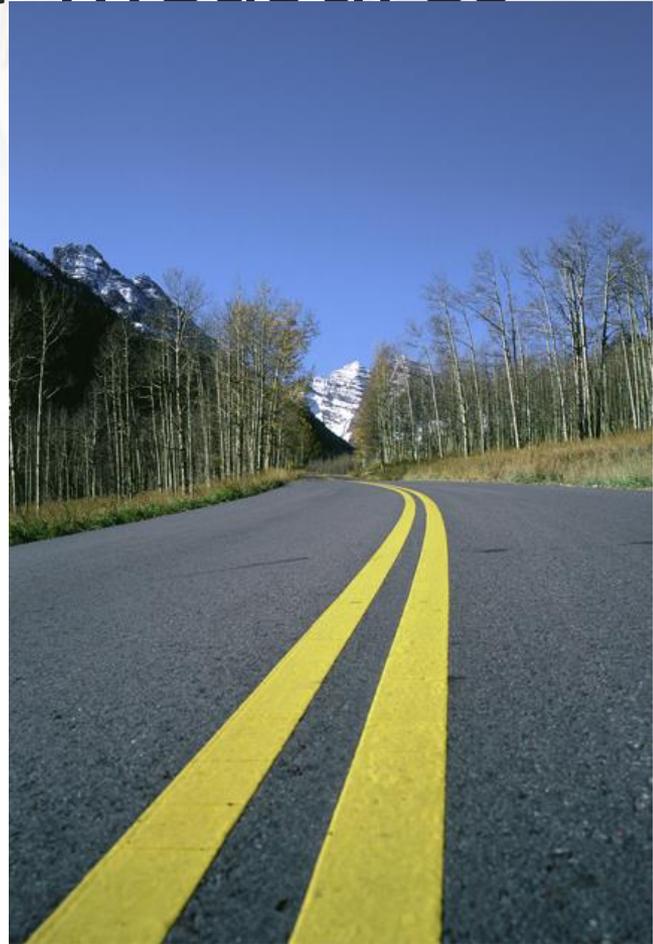
- A focus only on meeting short-term condition targets can encourage a 'worst first' approach
- Does not predict future trends
- We won't know where we're heading





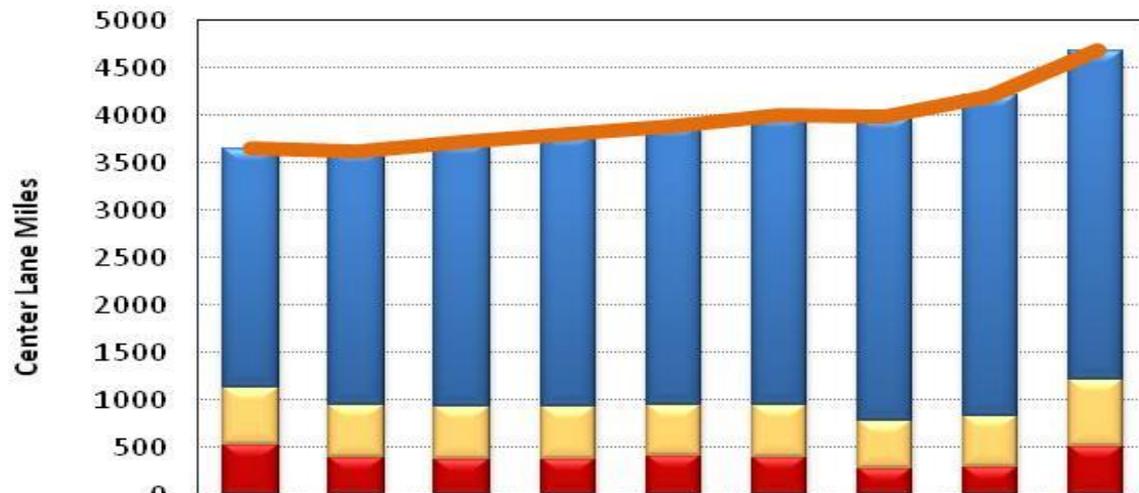
What are better measures

- Measures that encourage a long-term, lowest lifecycle approach
- Leading indicators of where the system is going
- They can encourage sound preservation, preventive maintenance and asset management principles
- Here are some examples



Utah DOT Investment Backlog

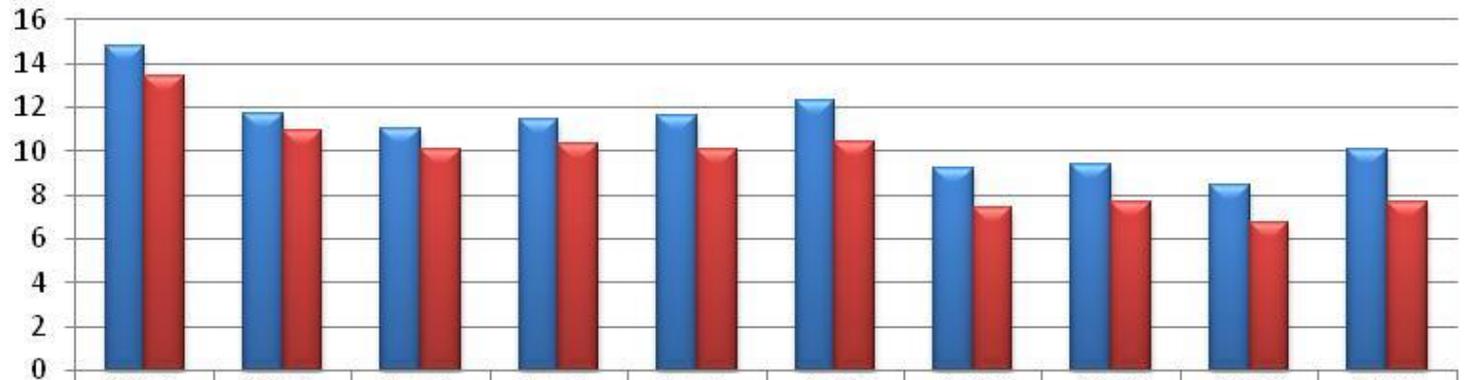
BackLog -Interstate, NHS and Non-NHS



	2010	2011	2012	2013	2014	2015	2020	2025	2030
Non-NHS CLM (No Work Done)	2530	2684	2791	2868	2948	3055	3213	3380	3465
NHS CLM (No Work Done)	602	555	560	549	529	545	493	542	701
Interstate CLM (No Work Done)	523	392	371	386	416	401	281	293	519
Total CLM In Backlog	3655	3632	3722	3802	3892	4000	3987	4214	4685

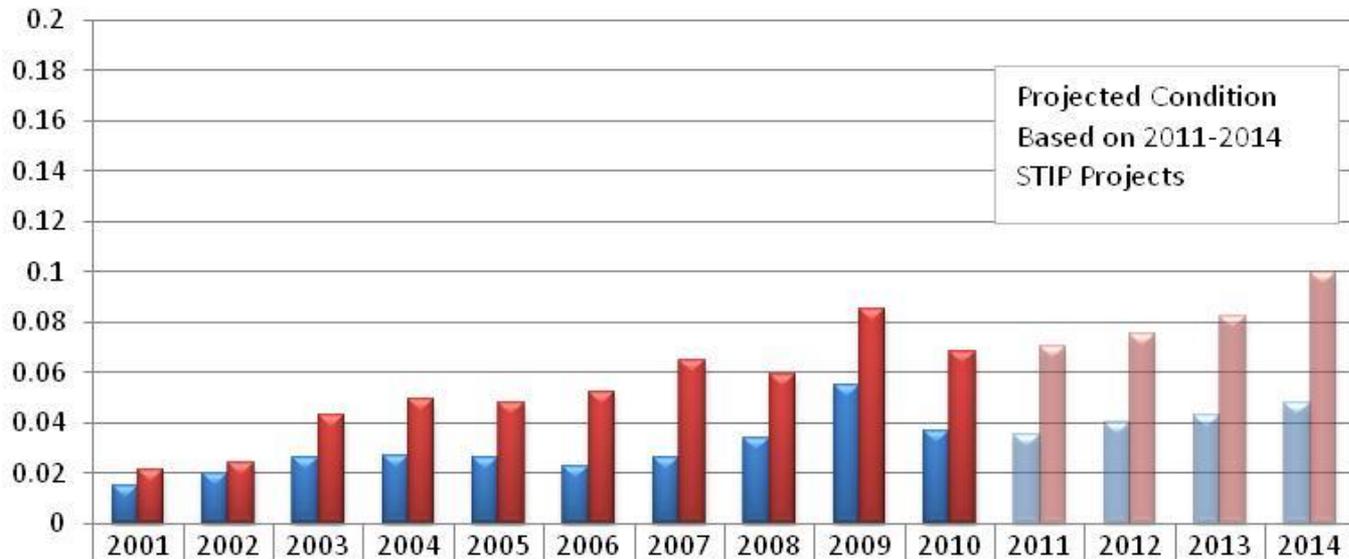
Declining Value of Pavements

Minnesota Statewide Pavement Average Remaining Service Life



MnDOT's Pavement Forecast

Statewide "Poor" Ride Quality Index



Principal Arterial	0.015	0.02	0.026	0.027	0.026	0.023	0.026	0.034	0.055	0.037	0.035	0.04	0.043	0.048
Non-Principal Arterial	0.021	0.024	0.043	0.049	0.048	0.052	0.065	0.059	0.085	0.068	0.07	0.075	0.082	0.1



Ohio Preservation Measures

- Overall rate of network average pavement section decline
- Reducing miles experiencing above-average condition decline
- Percentage of preventive maintenance target met
- Programming to achieve short-term, mid-term and long-term pavement-condition targets



Infrastructure Sustainability Measures

- Hopefully we'll see a growing focus on metrics that encourage sustainability, preservation
- Australians use
 - Asset Sustainability Index
 - Asset Consumption Ratio
 - Asset Renewal Funding Ratio



Definitions

Asset Sustainability Ratio

$$\frac{\text{Expenditures on Asset Renewal}}{\text{Depreciation of Assets}}$$

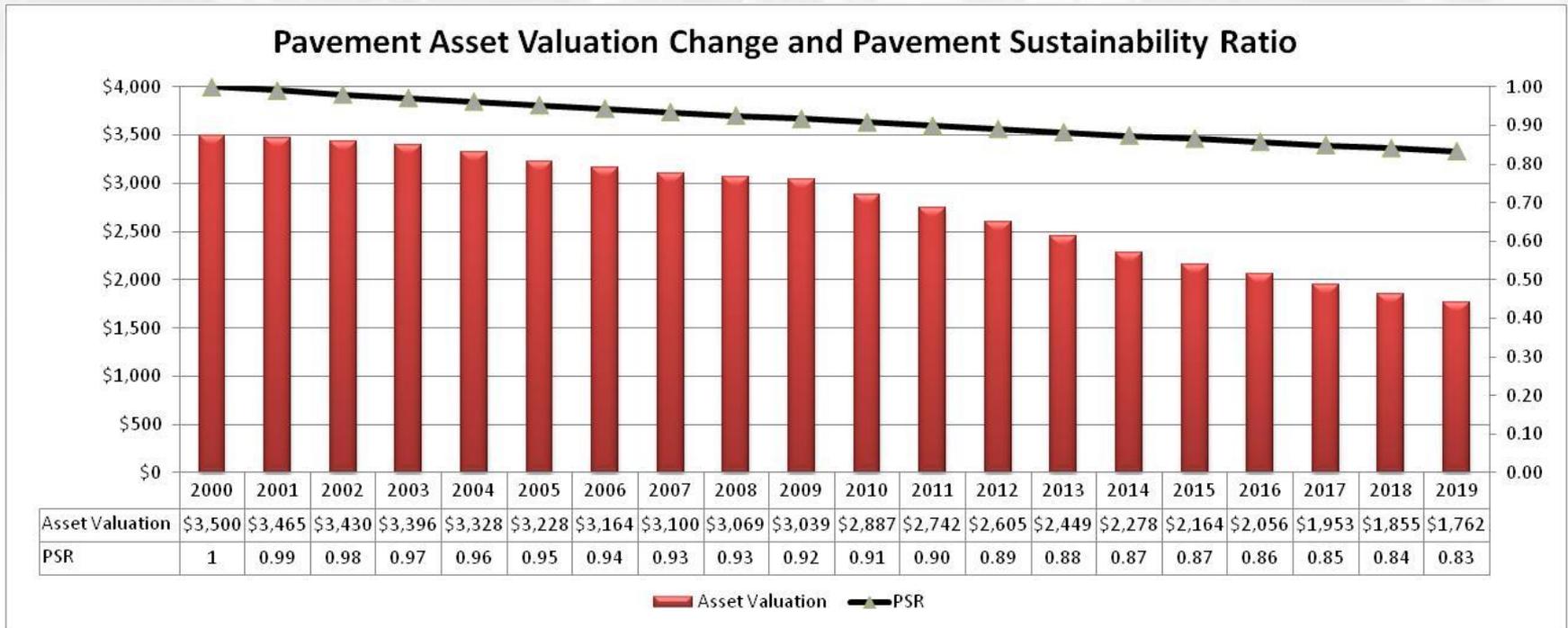
Asset Consumption Ratio

$$\frac{\text{Current Value of Assets}}{\text{Replacement Cost of Assets}}$$

Asset Renewal Ratio

$$\frac{\text{NPV Invested Over 10 Years}}{\text{Needed Investment to Sustain Assets}}$$

Declining Asset Values





My Hope for MAP-21

- It leads to a focus on leading measures
- Improves focus on long-term asset performance
- Incentivizes sound asset management, preservation principles
- Lead to improved management systems to provide sound, leading indicators of future condition trend lines