

# Setting Appropriate Goals and Measures

To Encourage Sound  
Infrastructure Preservation

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# An Age of Performance Measurement

- We are entering an age of performance management for transportation programs
- AASHTO, the GAO, the U.S. Congress all have declared their support for performance-based transportation programs
- MAP-21 mentions 'performance' more than 150 times
- It creates a requirement for federal, state MPO performance measures and targets



# An Age of Performance Management

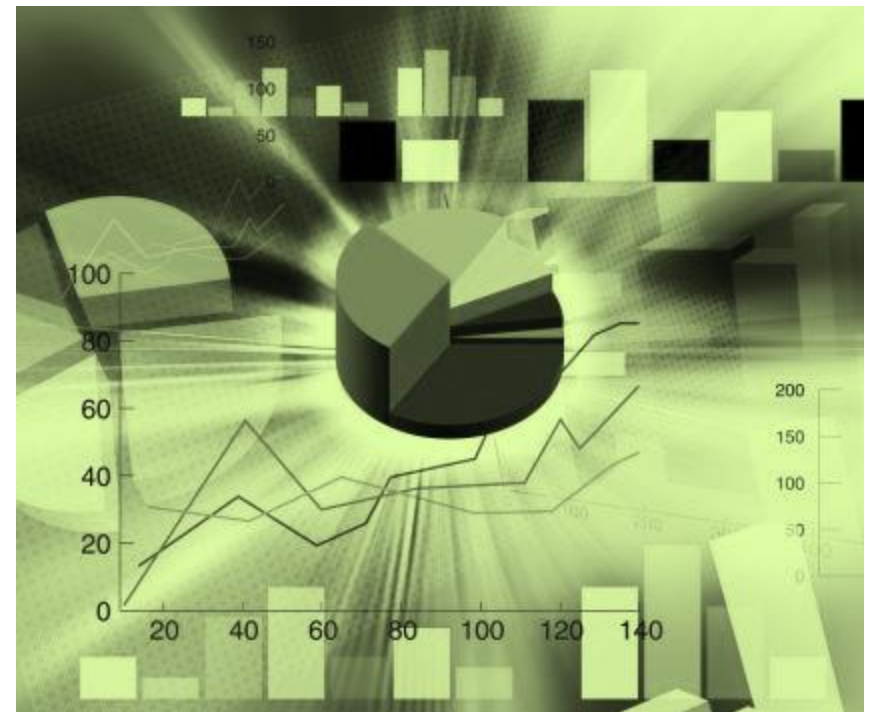
DECLARATION OF POLICY—Performance management will transform the Federal-aid highway program and provide a means to the most efficient investment of Federal transportation funds by refocusing on national transportation goals, increasing the accountability and transparency of the Federal-aid highway program, and improving project decision making through performance based planning and programming.



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# 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



# Current Shortage of Measures

- Because performance management is new, we don't have many good measures
- Presently we have national IRI, or International Roughness Index and Bridge Structural Deficiency data nationally
- These are important but incomplete
  - They only look backward and don't tell us about future trends
  - They also don't encourage sound asset management principals



# 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

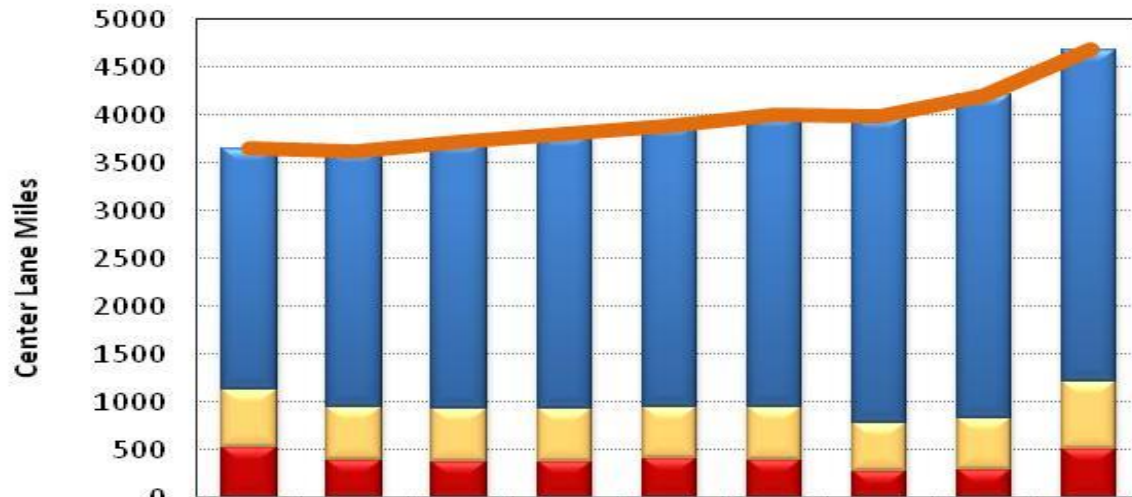


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# Utah DOT Investment Backlog

BackLog -Interstate, NHS and Non-NHS

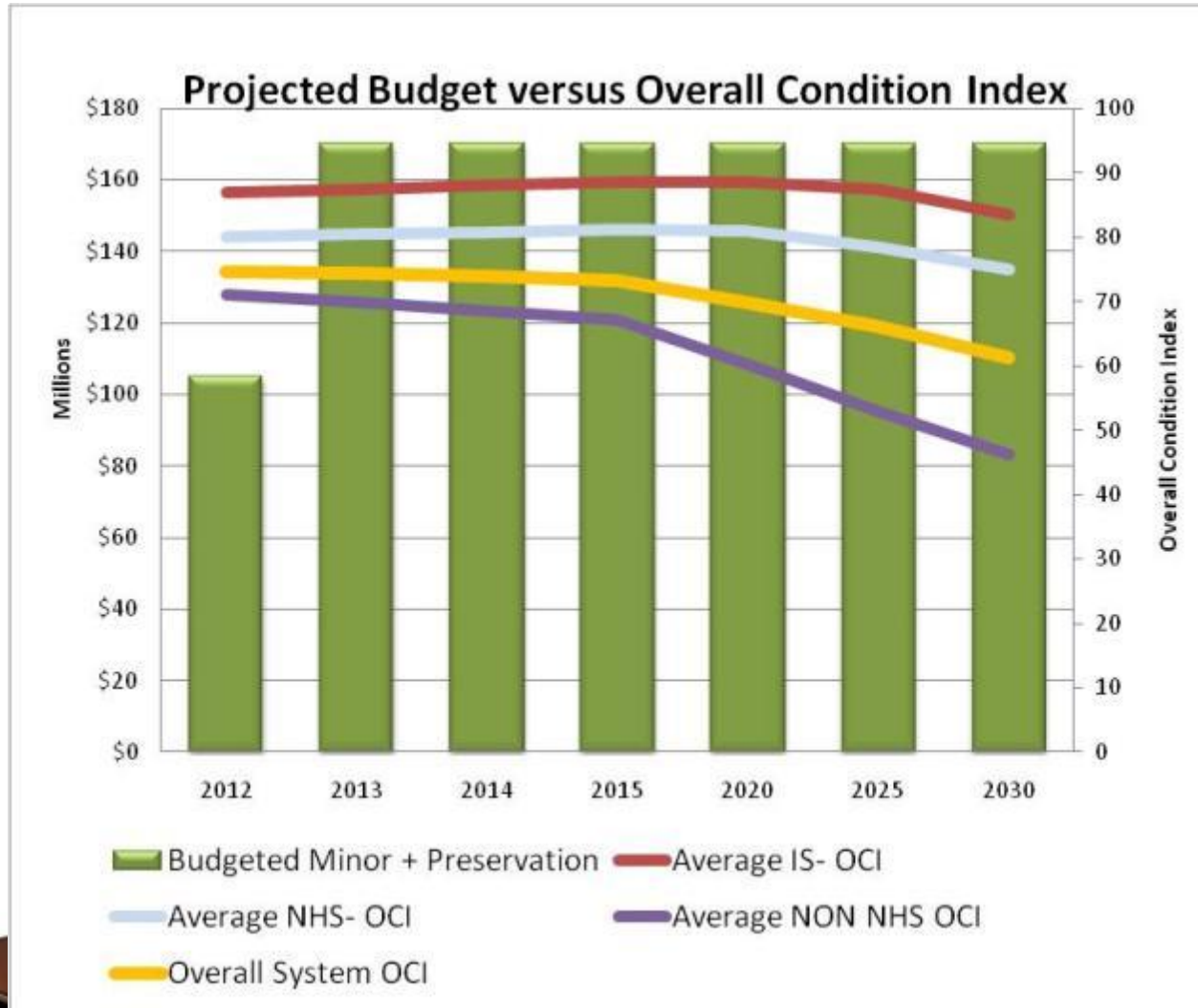


	2010	2011	2012	2013	2014	2015	2020	2025	2030
Non-NHS CLM (No Work Done)	2530	2684	2791	2868	2948	3055	3213	3380	3465
NHS CLM (No Work Done)	602	555	560	549	529	545	493	542	701
Interstate CLM (No Work Done)	523	392	371	386	416	401	281	293	519
Total CLM In Backlog	3655	3632	3722	3802	3892	4000	3987	4214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



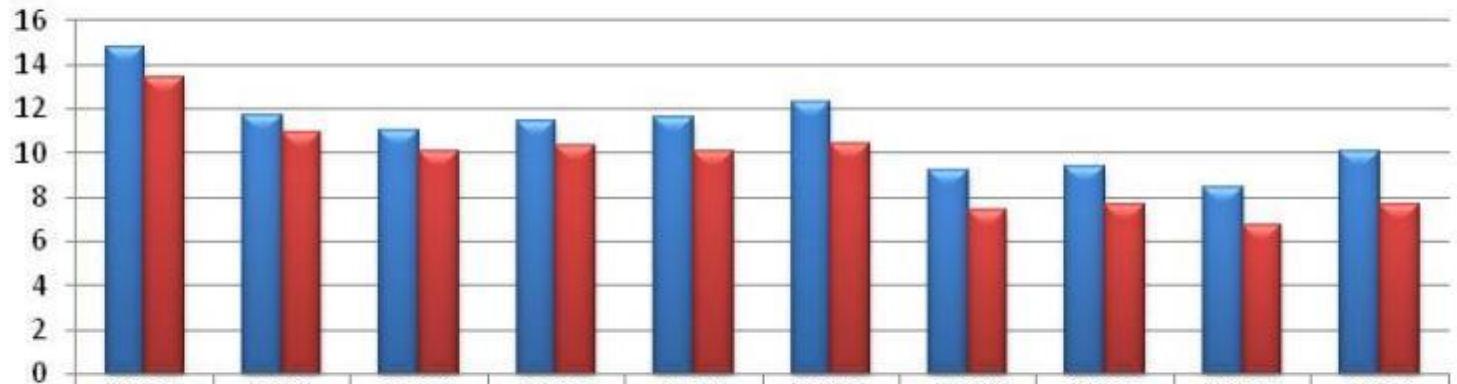


# Utah Pavement Forecast



# Declining Value of Pavements

**Minnesota Statewide Pavement Average Remaining Service Life**

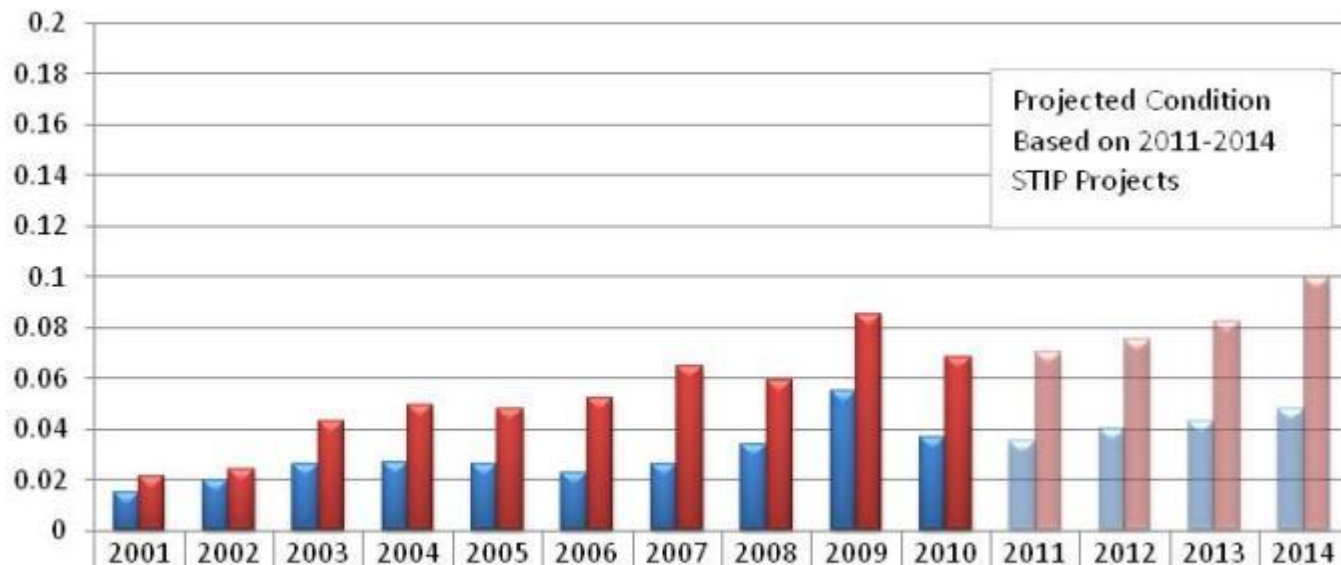


	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Principal Arterial	14.8	11.7	11	11.4	11.6	12.3	9.2	9.4	8.4	10.1
Non-Principal Arterial	13.4	10.9	10.1	10.3	10.1	10.4	7.4	7.7	6.7	7.7



# 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



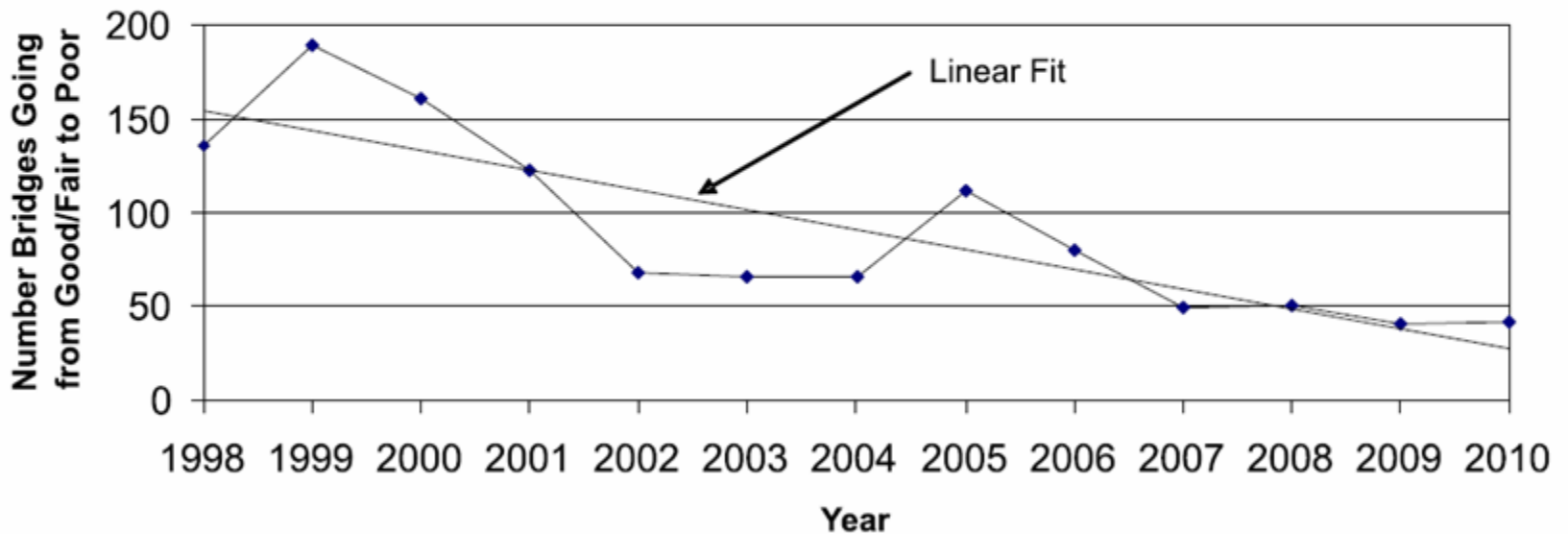
# Ohio Preservation Measures

- 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



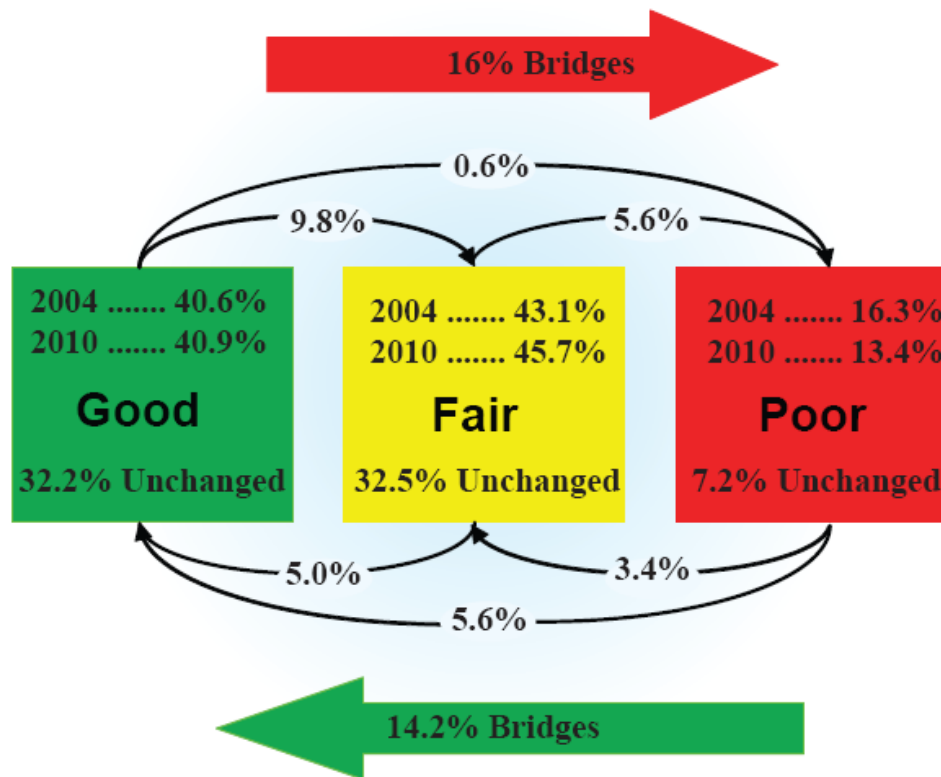
# Michigan Bridge Trends

## DETERIORATION RATE STATEWIDE TRUNKLINE BRIDGES



# Michigan Bridge Focus

## Bridges Cycle of Life 2004 - 2010





# 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



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# Definitions

Asset Sustainability Ratio

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

Asset Consumption Ratio

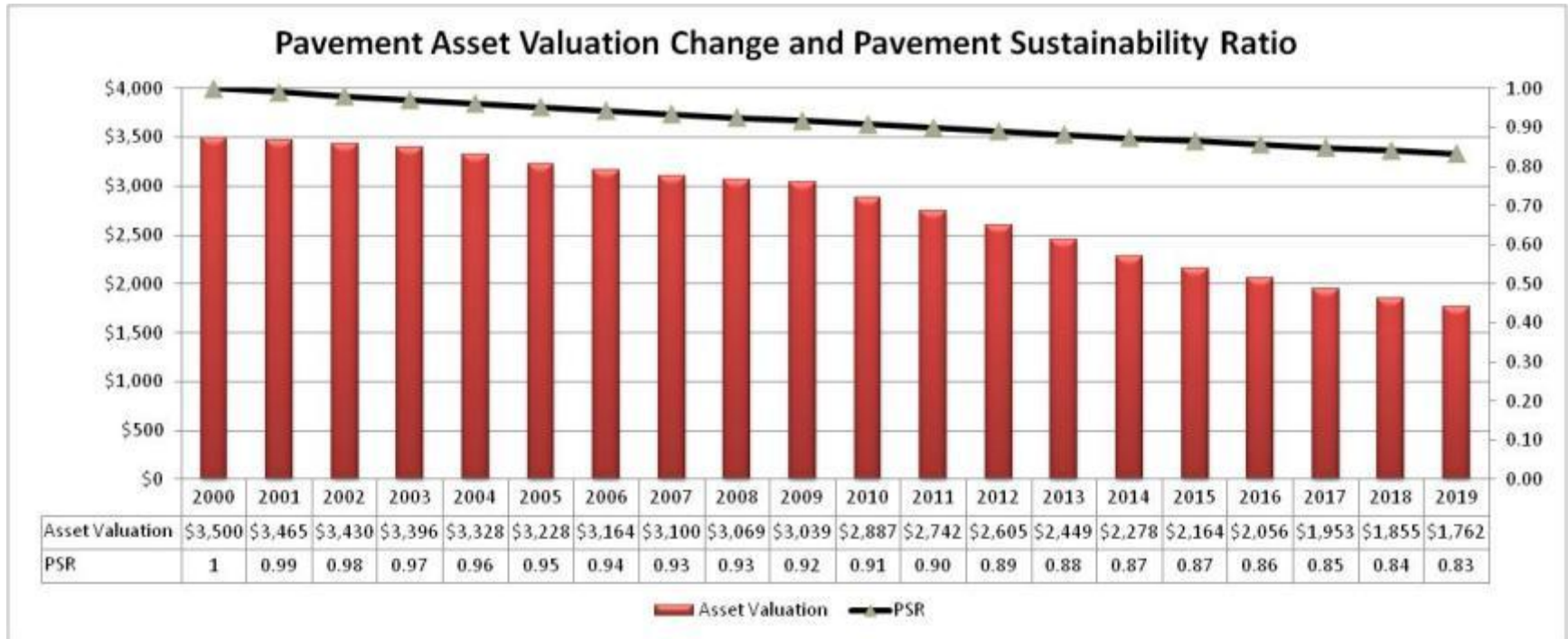
$$\frac{\text{Current Value of Assets}}{\text{Replacement Cost of Assets}}$$

Asset Renewal Ratio

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



# Declining Asset Values



# Asset Management Plans

- MAP-21 requires Transportation Asset Management Plans for the NHS
- These could include goals and targets for preservation
- Metrics that focus on short-term, mid-term and long-term sustaining of assets are best
- These inherently encourage preservation



# Performance Measure Lessons

- Focus on leading measures
- Focus on long-term asset performance
- Incentivize sound asset management, preservation principles
- A challenge will be to improve our management systems to provide sound, leading indicators of future condition trend lines

