Communicating Maintenance Needs Through a Transportation Asset Management Plan

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applied pavement TECHNOLOGY

providing engineering solutions to improve pavement performance

Presentation Topics

- Introduction to a Transportation Asset Management Plan (TAMP)
- Strategies for Communicating Maintenance Needs
- Information Needed

MAP-21 TAMP Requirements

- *State Performance Management-*
- *(1) IN GENERAL- A State shall develop a risk-based asset management plan for the National Highway System to improve or preserve the condition of the assets and the performance of the system.*

MAP-21 TAMP Requirements (cont)

- *(4) PLAN CONTENTS- A State asset management plan shall, at a minimum, be in a form that the Secretary determines to be appropriate and include--*
  - *(A) a summary listing of the pavement and bridge assets on the National Highway System in the State, including a description of the condition of those assets;*
  - *(B) asset management objectives and measures;*
  - *(C) performance gap identification;*
  - *(D) lifecycle cost and risk management analysis;*
  - *(E) a financial plan; and*
  - *(F) investment strategies.*

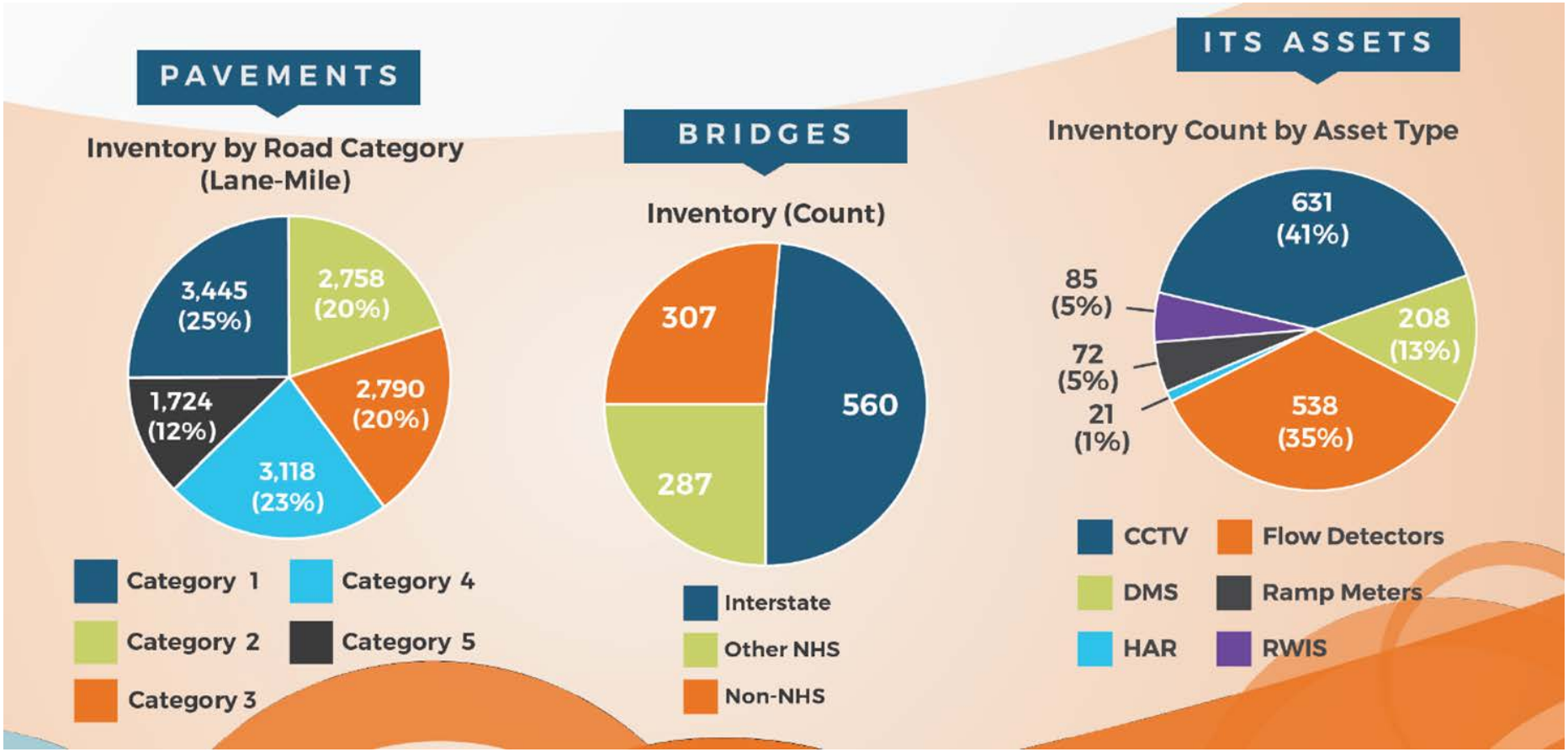
A TAMP Helps Tell Your Story & Align Decisions

- The TAMP outlines current asset management practices, long term revenue forecasts, 10-year investment strategies, and planned improvements to business processes

DECISIONS ALIGNED AT ALL LEVELS

Showcasing Maintenance in a TAMP

- Raising the Profile of Maintenance



Showcasing a Focus on Preservation

We spend 93% of our time and resources taking care of what we have.

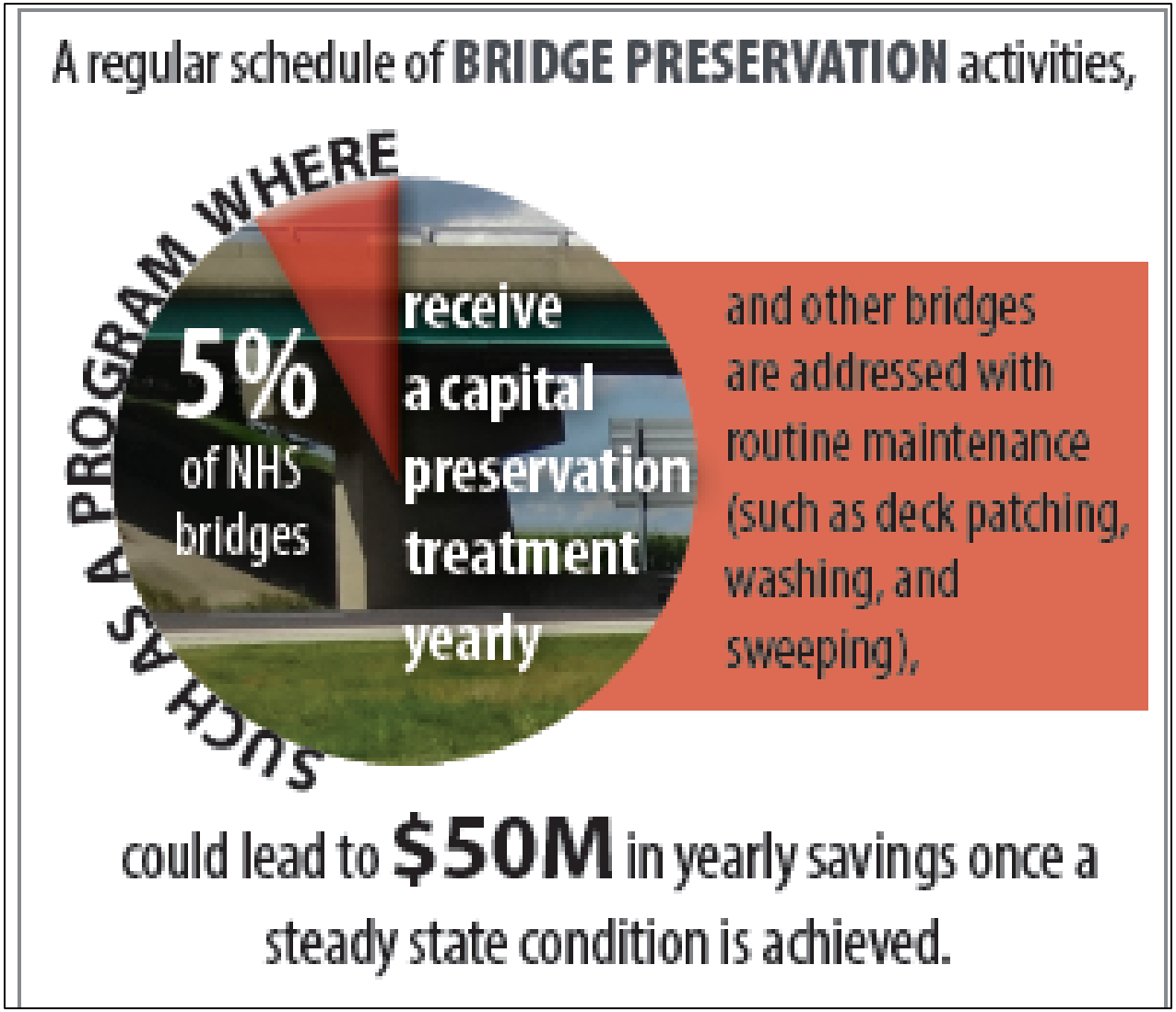
Strategies For Communicating Maintenance Needs

- Whole Life (or Life Cycle) Costing
- Risk Assessment
- Investment Strategies
- Financial Metrics

Whole Life Costing

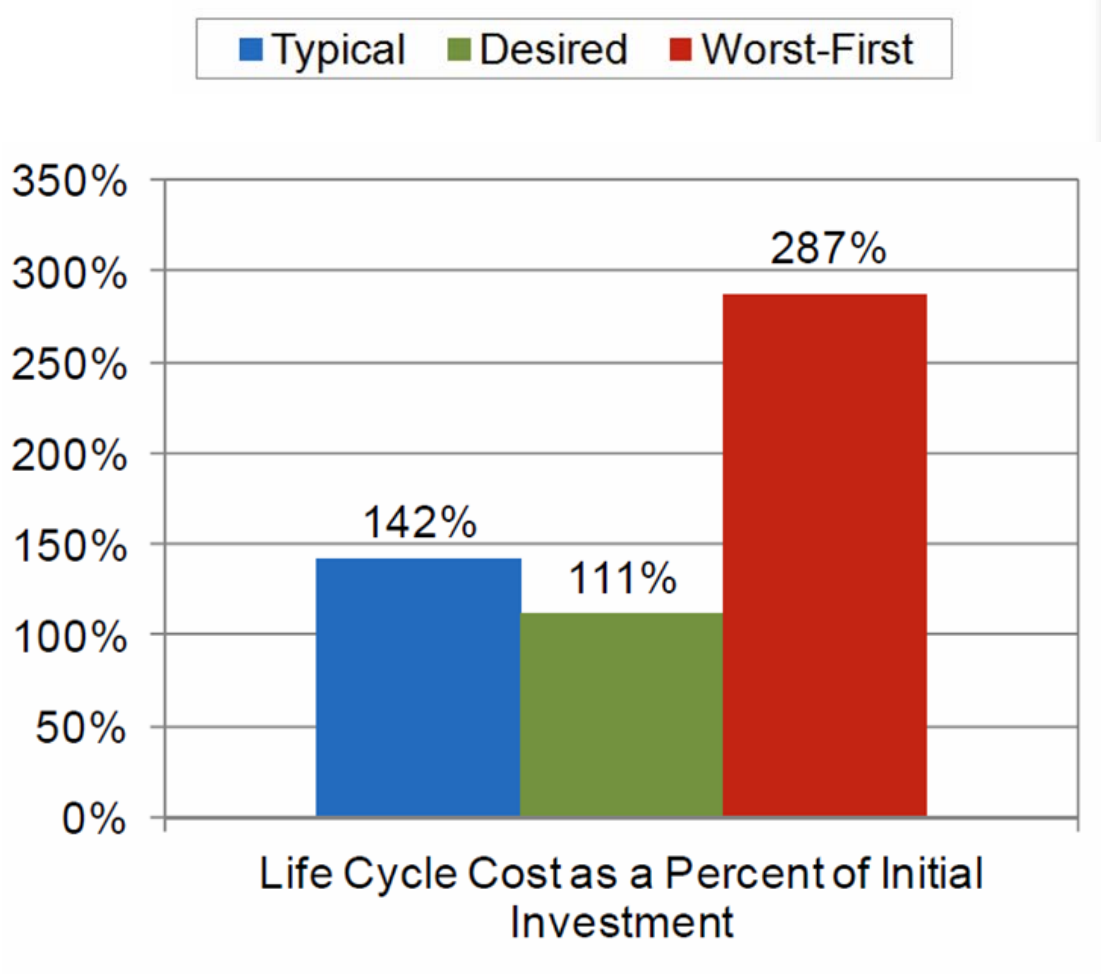
- Intended to show that agencies are managing assets cost-effectively
- Provides an opportunity to show the importance of maintenance to preserve asset conditions
- Also provides a way to show future maintenance needs associated with system expansion

Importance of Maintenance



Future Maintenance Costs

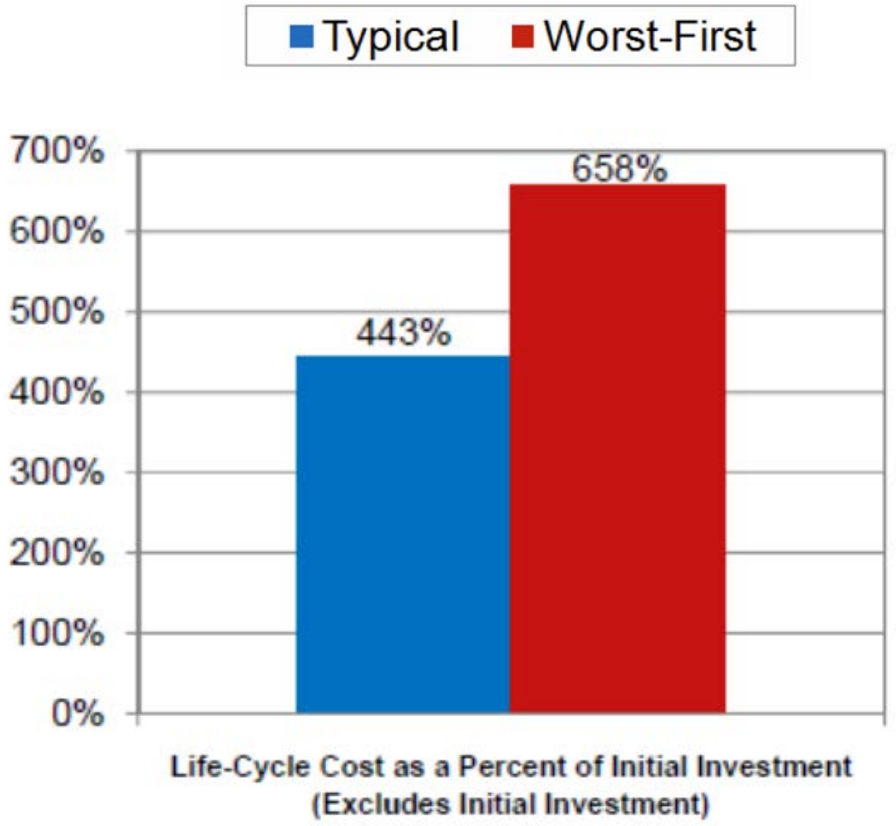
For every $1 invested in a new mile of road, future maintenance costs range from $1.11 to $2.87 over the analysis period



From Minnesota DOT TAMP

Future Maintenance Costs

For every $1 invested in a new culvert, future maintenance costs range from $4.43 to $6.58 over the analysis period



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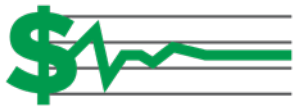
Risks

- Risks should be linked to investment strategies

Likelihood Ratings and Risk Levels					
Impact Ratings	**Rare (1)**	**Unlikely (2)**	**Moderate (3)**	**Likely (5)**	**Almost Certain (5)**
Catastrophic (5)	Low	Medium	High	Extreme	Extreme
Major (4)	Low	Medium	High	High	Extreme
Moderate (3)	Low	Low	Medium	High	High
Minor (2)	Very Low	Low	Low	Medium	Medium
Insignificant (1)	Very Low	Very Low	Low	Low	Low

Sample Risks Impacting Maintenance

Key Risks:



Flattened revenues

Changing workforce

Extraordinary weather events

Price volatility

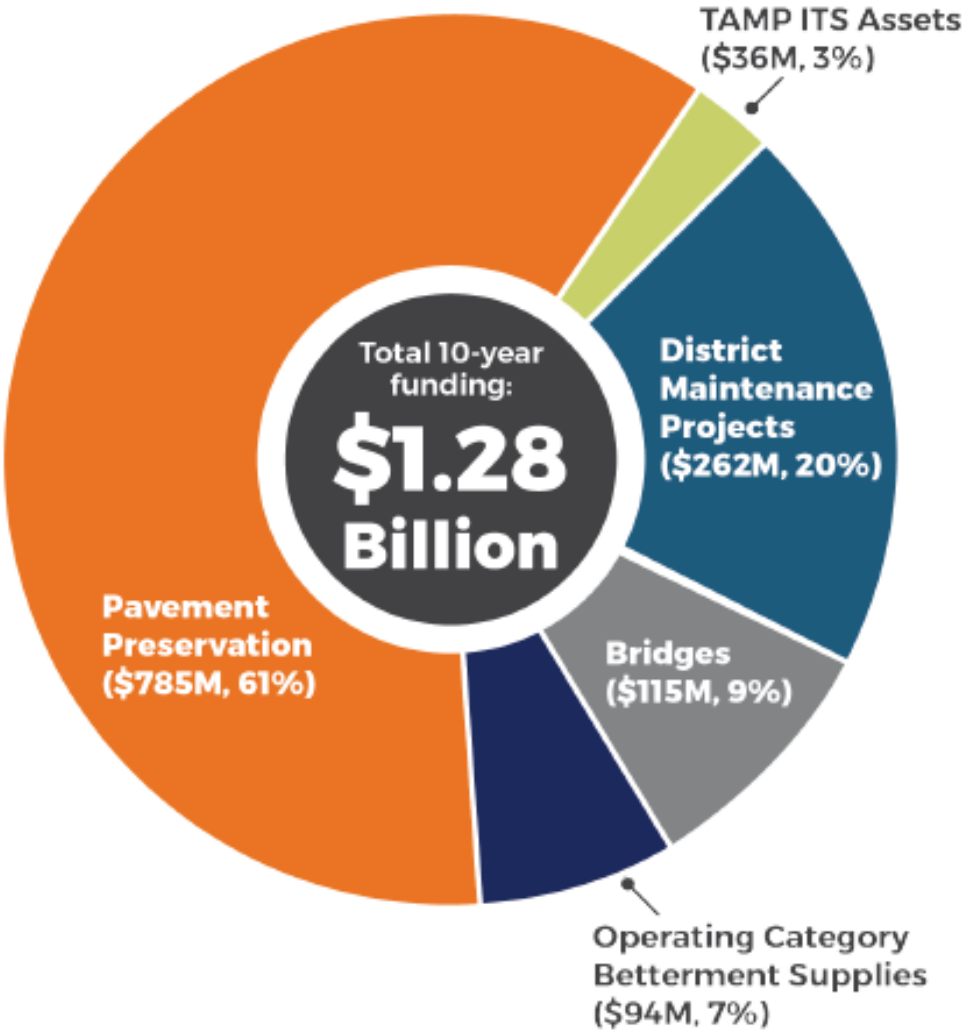
IMMEDIATE
15%

1 YEAR
4%

5 YEARS
16%

BY 2021
35%
WILL RETIRE

Summary of 10-Year Investments



Investment Strategies

Figure ES-9: Targets and Planned or Needed Investment to Achieve Targets

ASSET	CURRENT CONDITION	TARGET RECOMMENDATION	INVESTMENT*
Pavement: Interstate	2.4% Poor	≤ 2% Poor	$392 million
Pavement: Non-Interstate NHS	4.3% Poor	≤ 4% Poor	$1.13 billion
Pavement: Non-NHS	7.5% Poor	≤ 10% Poor	$1.38 billion
Pavement: Total	**NA**	**NA**	**$2.9 billion**
Bridge: NHS	4.7% Poor	≤ 2% Poor	$1.10 billion
Bridge: Non-NHS	2.1% Poor	≤ 8% Poor	$430 million
Bridge: Total	**NA**	**NA**	**$1.53 billion**
Hydraulic Infrastructure: Highway Culverts	10% Poor; 6% Very Poor	≤ 8% Poor; ≤ 3% Very Poor	$ 400 million
Hydraulic Infrastructure: Deep Stormwater Tunnels	39% Poor; 14% Very Poor	≤ 8% Poor; ≤ 3% Very Poor	$ 35 million (condition) + $1.6 million (inspection)
Other Traffic Structures: Overhead Sign Structures	6% Poor; 8% Very Poor	≤ 4% Poor; ≤ 2% Very Poor	$8 million

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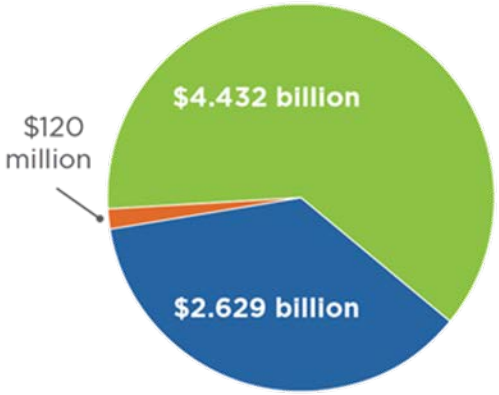
Investment Strategies

Reducing overall life cycle costs of maintaining pavements, bridges, and culverts requires:

- Increased preservation activities
- A unified approach to maintenance and capital planning

Projected Funding Through 2021



- Pavements
- Bridges
- Culverts

Goals Through 2021

- Priority System CSF: 85
  General System CSF: 80
- General Appraisal CSF: 6.8
  Percent in Fair or better condition: 98%
- 95% in Fair or better condition

Financial Metrics

- Asset Value

Figure ES-3: Replacement Cost by Asset Category

ASSET CLASS	REPLACEMENT COST
Pavements	$29.5 billion
Bridges (includes large bridges and culverts greater than 10 feet)	$6.6 billion
Hydraulic Infrastructure: Highway Culverts	$1.7 billion
Hydraulic Infrastructure: Deep Stormwater Tunnels	$300 million
Other Traffic Structures: Overhead Sign Structures	$200 million
Other Traffic Structures: High-Mast Light Tower Structures	$19 million

From Minnesota DOT TAMP

Financial Metrics

- Annualized Costs

Figure ES-7: Asset Annualized Life-Cycle Costs

ASSET CLASS	ANNUALIZED COST
Pavements	$12,000 per lane-mile
Bridges: Large Bridges	$16,000 per bridge
Bridges: Culverts 10 feet or greater	$1,300 per large culvert
Hydraulic Infrastructure: Highway Culverts	$150 per small culvert
Hydraulic Infrastructure: Deep Stormwater Tunnels	$30,000 per mile of tunnel
Other Traffic Structures: Overhead Sign Structures	$900 per structure
Other Traffic Structures: High-Mast Light Tower Structures	$400 per structure

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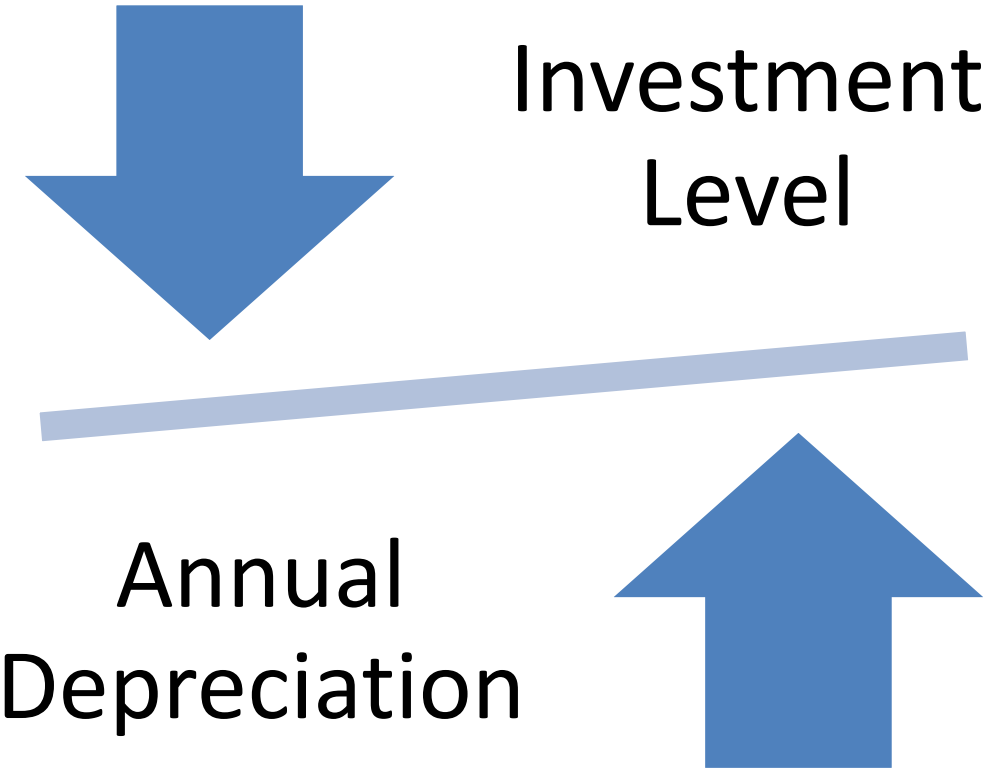
Financial Metrics

- Asset Sustainability Ratio (ratio of investment level to annual depreciation)

  Are you investing at levels to offset annual depreciation?



Information Needed

- Actual or estimated inventory
- Assessment of performance
  - Condition
  - Age
- Estimate of amount of work being done
- Cost information

Questions?

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