

# Explanation for the Benefits of Asset Management Slide Deck

- ▶ The following slide deck explains the benefits of transportation asset management. It is intended for state department of transportation (DOT) officials who want to explain asset management to their staff, to legislators, or to local government officials. The deck emphasizes the benefits of asset management and discusses the role of local agencies in sustaining assets on the National Highway System (NHS.)
- ▶ The slide deck is intentionally long and detailed to provide material for different types of audiences. Used in its entirety, the deck may be appropriate for explaining asset management and the related performance rules to an internal state DOT audience that needs a comprehensive understanding of the issues

# Explanation for the Benefits of Asset Management Slide Deck -2

- ▶ For an audience with more narrow interests, the deck allows for slides to be dropped to tailor the presentation to the needs of the audience. For example, if the audience consists of local government officials who may be curious about their role in managing locally owned NHS assets, the slides relevant to that topic could be retained and many other slides dropped.
- ▶ Also, many slides can be used as they are, or they can be replaced with ones that include State and local agency-specific data. These slides address issues such as the local conditions of NHS assets, or State-managed NHS assets. The slides and the notes indicate which ones are intended for local customization and what content should be replaced in the slides.
- ▶ Speaker's notes are included with each slide. The notes provide suggestions for how to customize some slides to make them locally relevant. Or the deck can be used "as is" and the speaker's notes allow a presenter to provide an overview of what is asset management, what are its benefits, and how it helps sustain the transportation system in a state of good repair.

# Notice and Disclaimer

- ▶ The contents of this slide deck reflect the views of the Transportation Asset Management Expert Task Group, who are responsible for the facts and the accuracy of the data presented herein. The U.S. Government assumes no liability for the use of the information. The contents do not necessarily reflect the official view or policies of the Federal Highway Administration (FHWA). The contents do not constitute a standard, specification, or regulation. The FHWA does not endorse products or manufacturers. Trade or manufacturers' names appear herein solely because they are considered essential to the object of this report.
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# Asset Management

# What is Asset Management?

## Asset management

“Is a *strategic and systematic process* of operating, maintaining, and improving physical assets, with a focus on both engineering and economic analysis based upon quality information, 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.”

# What is an Asset Management Plan?

- ▶ An asset management plan is a strategic plan for managing an organization's infrastructure and other assets to deliver an agreed standard of service.
- ▶ Typically, an asset management plan will cover more than a single asset, taking a system approach - especially where a number of assets are co-dependent and are required to work together to deliver an agreed standard of service.

# Why Adopt Asset Management?

## Legislative Drivers

- ▶ MAP-21/ FAST Act requires a risk-based asset management plan
- ▶ MAP-21/ FAST Performance Management (PM 2) performance target requirements
- ▶ Other State Laws/Legislation?
- ▶ State Policy?

# Why Adopt Asset Management, Continued

Also, adopting asset management helps to:

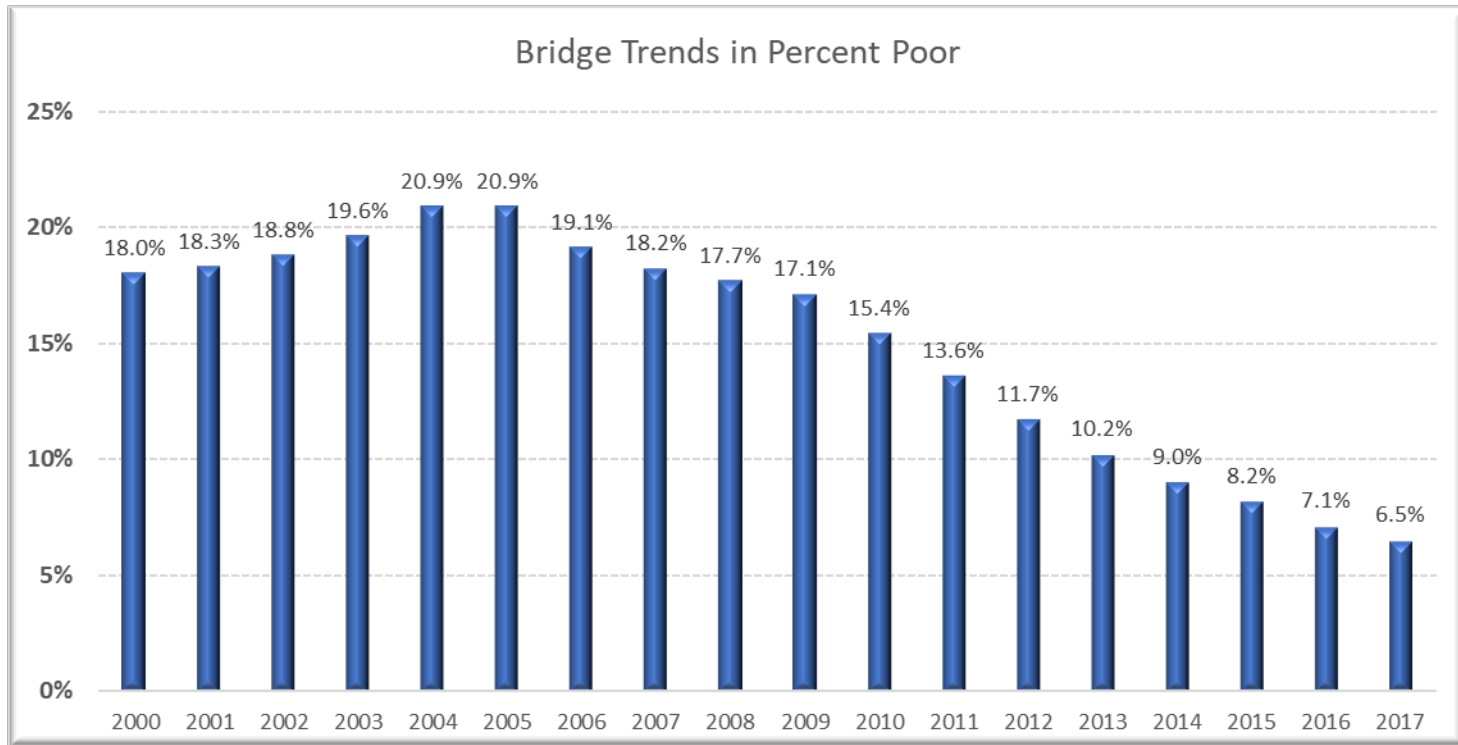
- ▶ Develop long-term **investment strategies** to manage assets over their whole life.
- ▶ Manage infrastructure performance for at least **10 years from now**
- ▶ Manage risks to system performance and condition of assets



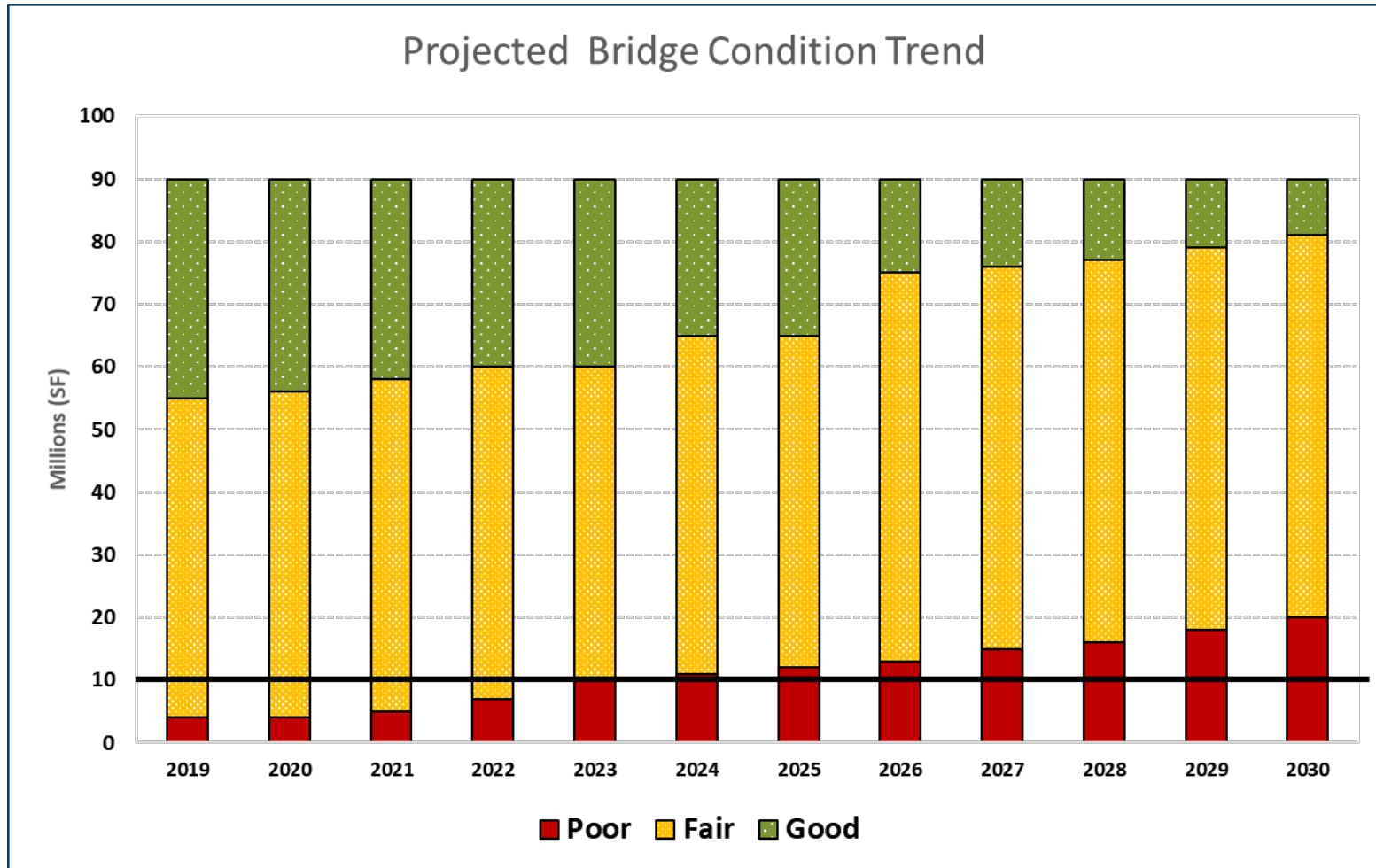
# Benefits of Asset Management?

- ▶ Provide the information available to make good decisions
- ▶ Show quantitatively the condition trends and improvements
- ▶ Show the implications of current investments on future asset conditions and gaps
- ▶ Show the return on investments
- ▶ Communicate the value of preservation
- ▶ Communicate the cost of ownership and benefits of life-cycle planning
- ▶ Provide a strategic framework for consistent decision making
- ▶ Demonstrate accountability for public funds

# Show Condition Trends

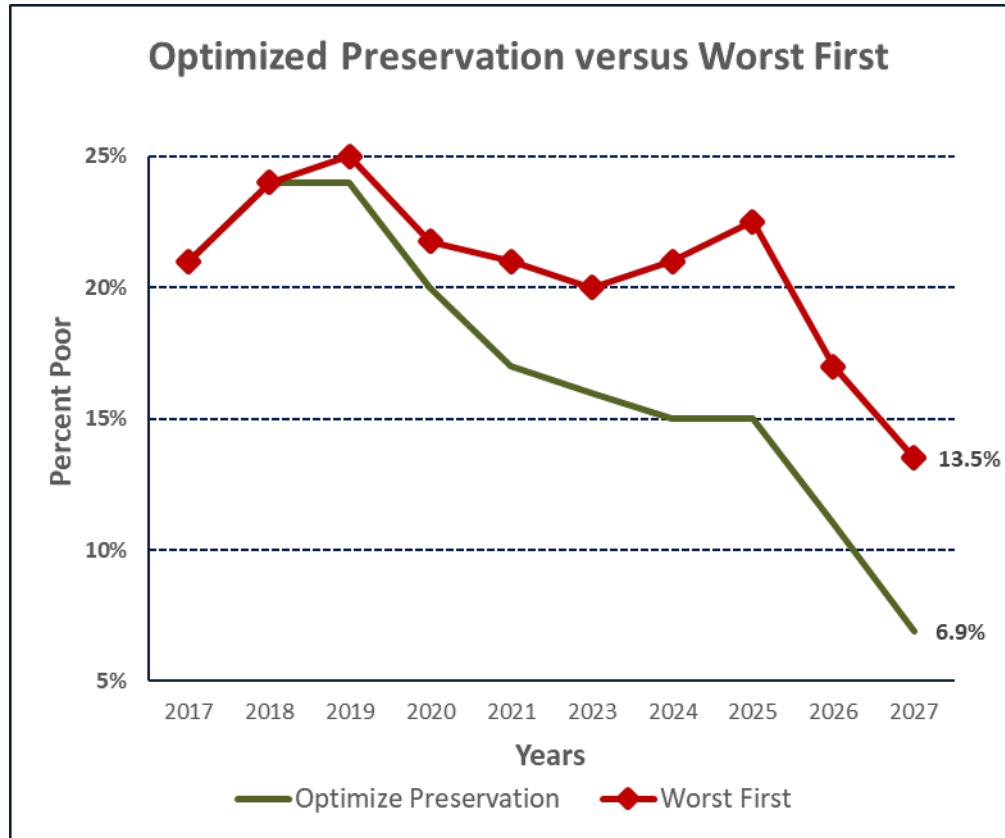


# Convey Forecasted Gaps

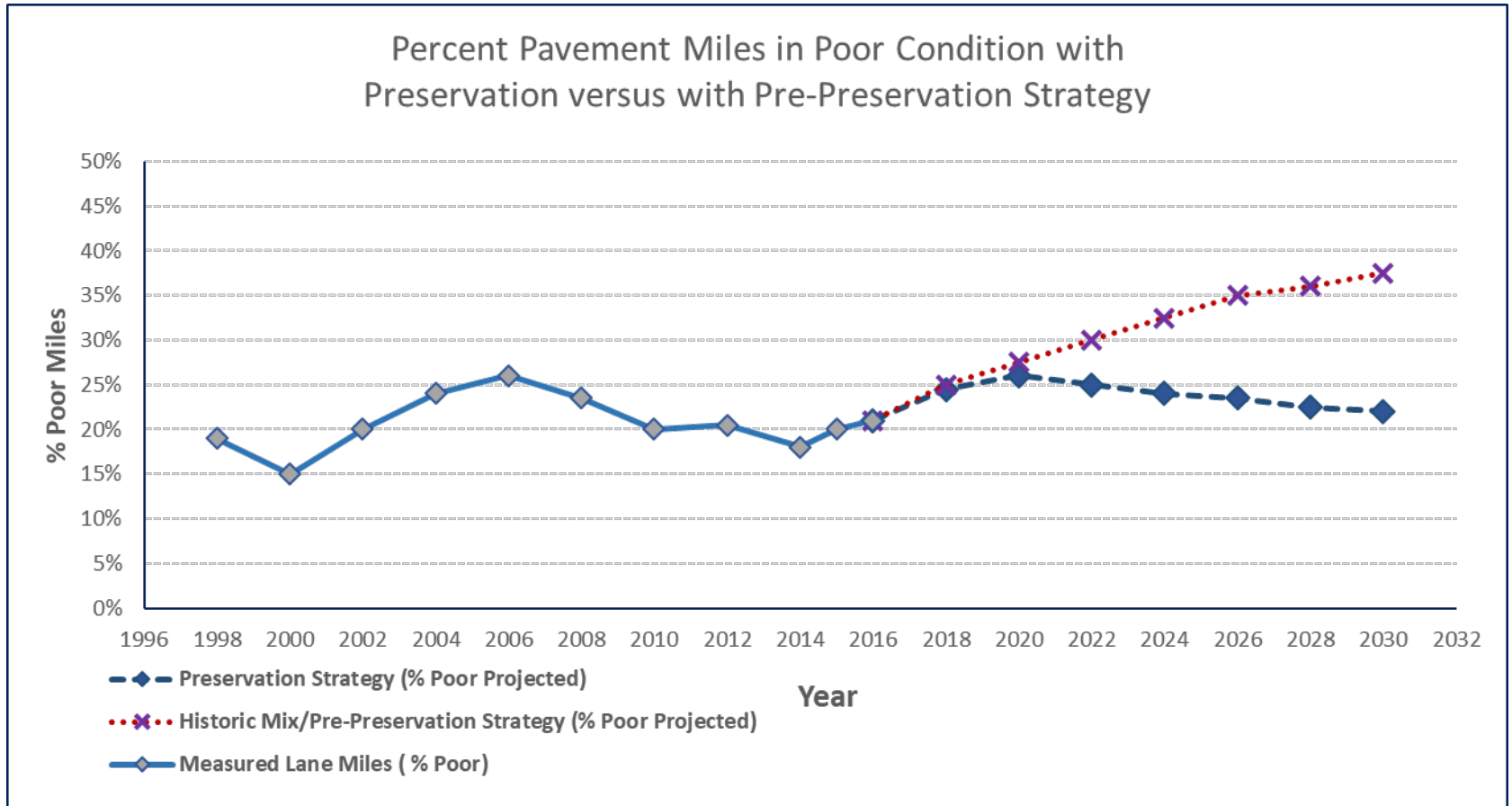


# Convey Return on Investment

- ▶ Asset management can help quantify the benefits generated

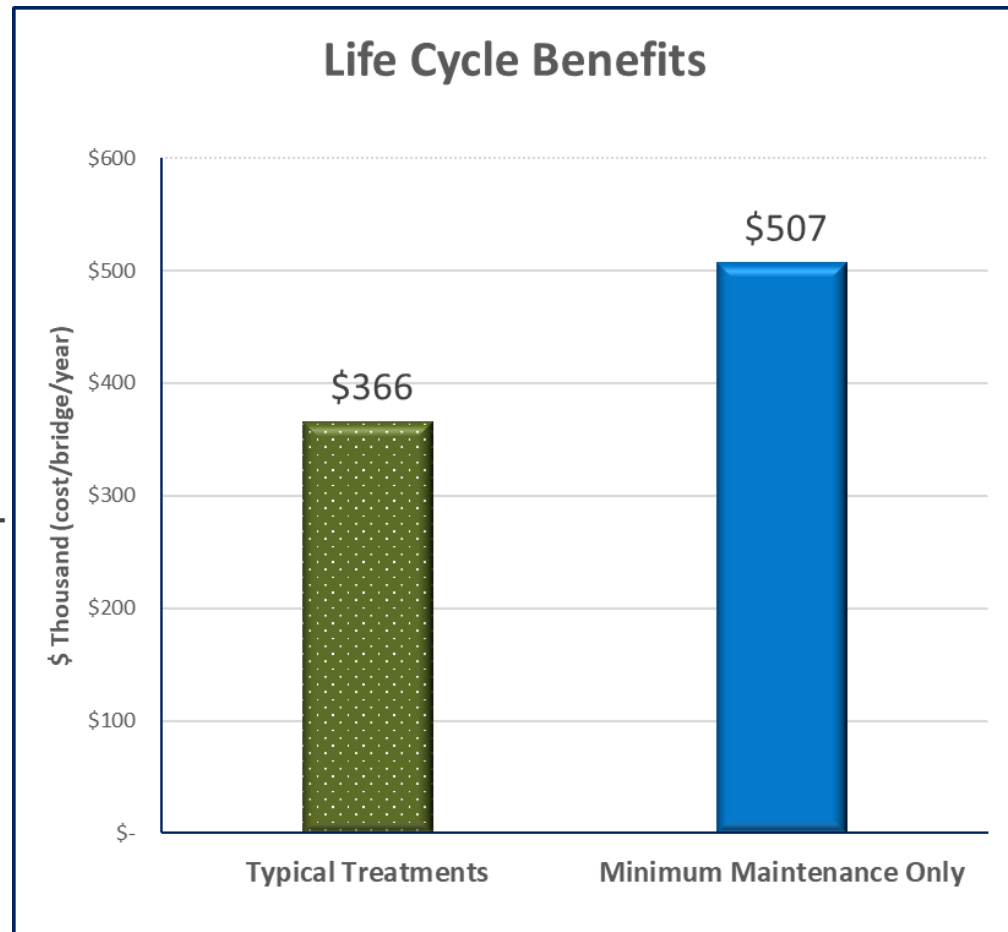


# Convey Value of Preservation



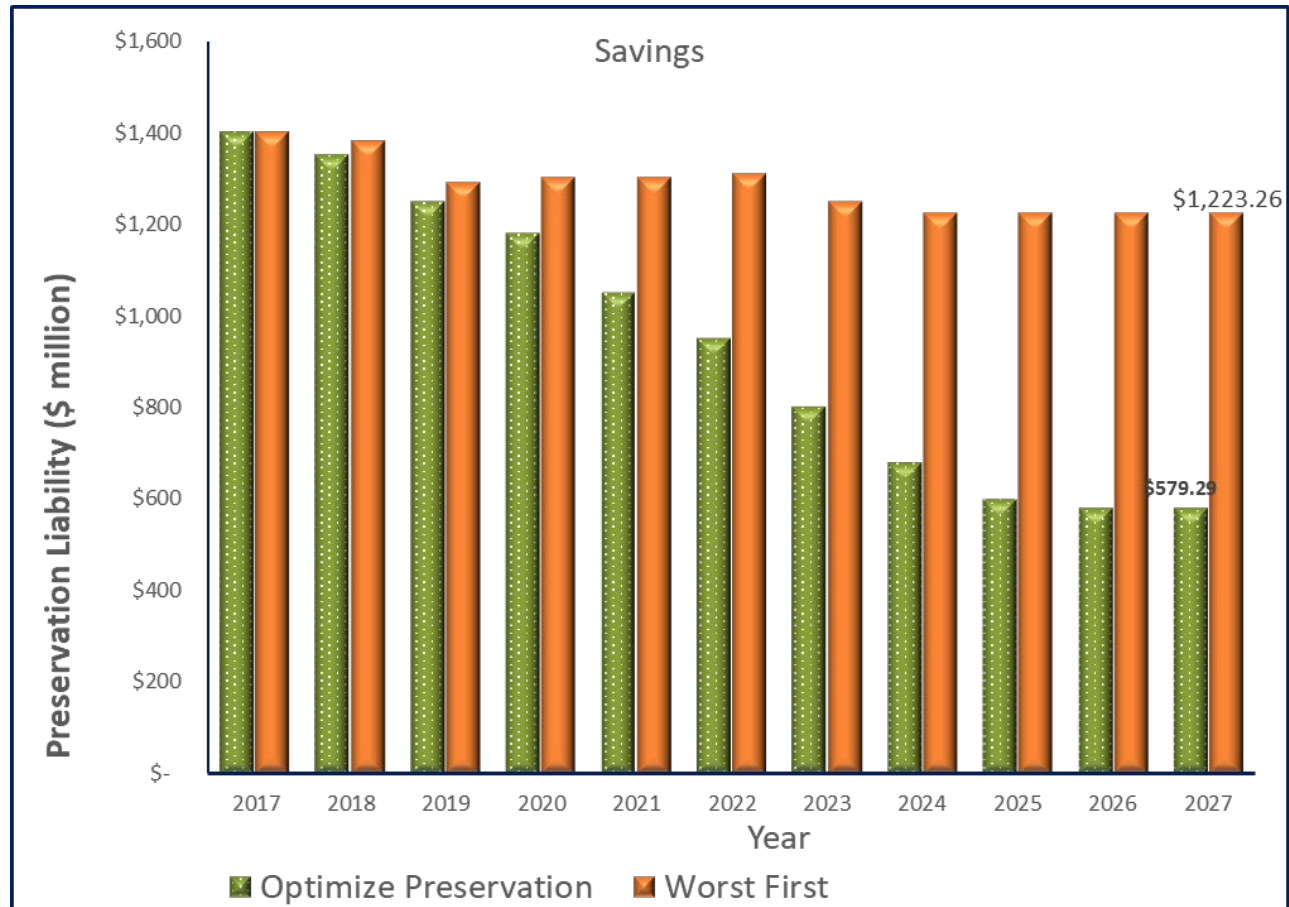
# Document LCP Benefits

- ▶ Life-cycle planning approach results in more than \$141,000 in annual savings per bridge
- ▶ Annual cost under an LCP approach is \$366,000 compared to \$507,000 under a worst-first approach



# Shows LCP Savings

- ▶ LCP reduces backlog by 53% compared to “worst-first”
- ▶ This example show that by 2027 backlog using “worst first” is \$1223.26 million versus \$579.29 million using LCP



# Asset Management Plan Requirements

## 23 CFR 515

### 23 CFR 515.9

- ▶ State DOTs shall develop and **implement** an asset management plan **to improve or preserve** the condition of the assets and improve the performance of the NHS in accordance with the requirements of this part.
- ▶ Asset management plans must describe how the State DOT will carry out asset management as defined in 23 CFR 515.5.



# Asset Management Plan Requirements

- ▶ Inventory of NHS Bridges and Pavements
  - ▶ Asset Management Objectives
  - ▶ Measures and State DOT Targets
  - ▶ Performance Gap Identification
  - ▶ Life Cycle Planning
  - ▶ Risk Management Analysis
  - ▶ Financial Plan
  - ▶ Investment Strategies
- Additionally
- ▶ Improvement Plan
  - ▶ Internal/External Stakeholder Engagement

# Assets Addressed in the TAMP

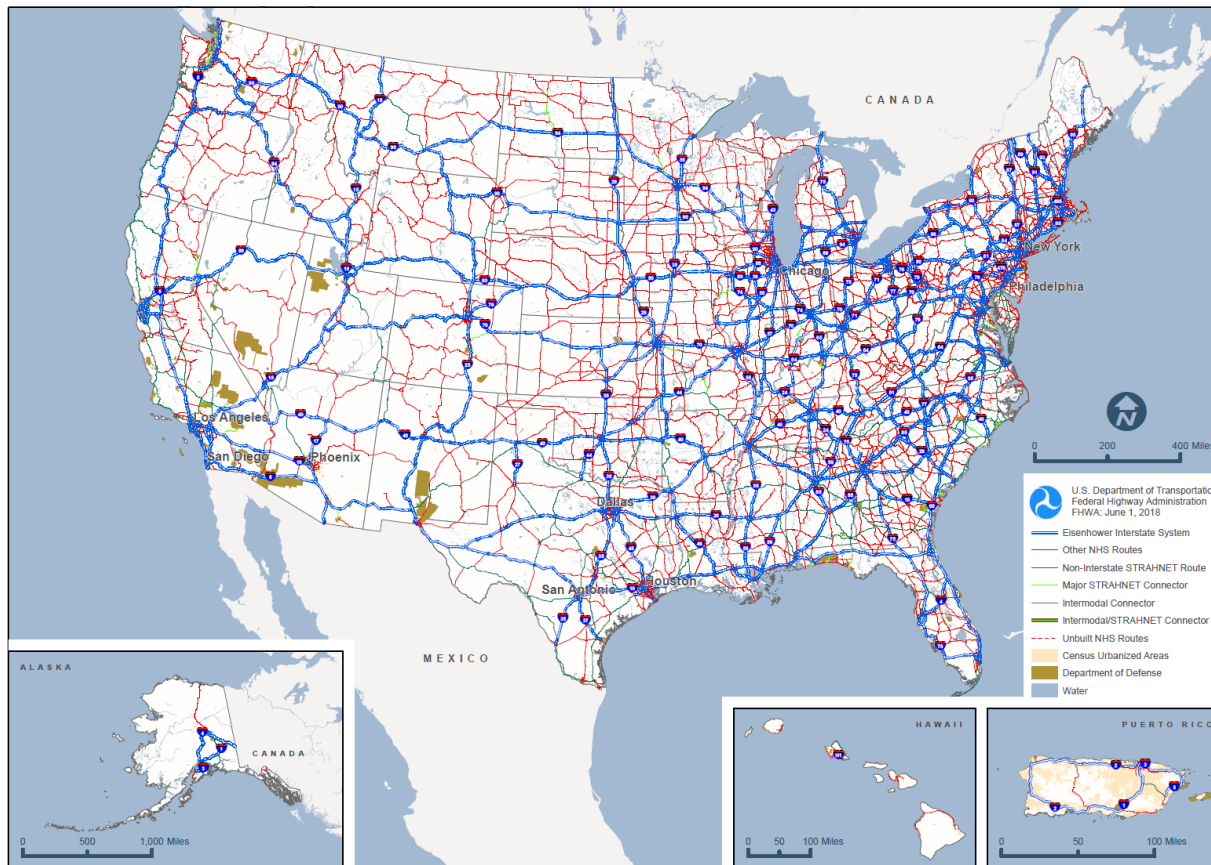
## States shall include

- ▶ Pavements
  - ▶ Interstate Pavements
  - ▶ Non-Interstate NHS Pavements
- ▶ Bridges
  - ▶ NHS
- ▶ Optional
  - ▶ Other SHS Pavement
  - ▶ Non-NHS bridges

## ▶ Other assets included

- ▶ Culverts
- ▶ Signs
- ▶ Signals
- ▶ Drainage
- ▶ ITS
- ▶ Other

# National Highway System (NHS)



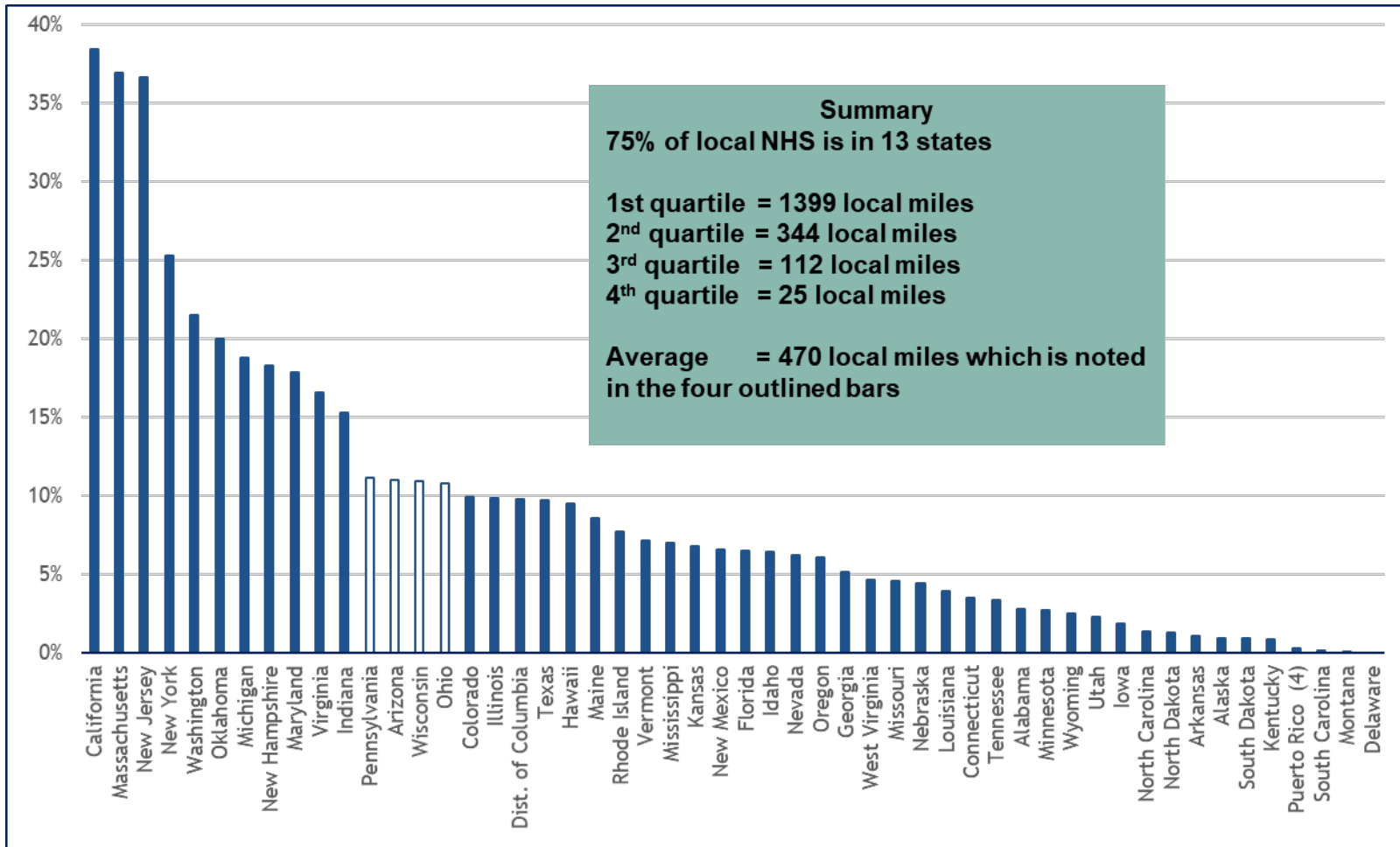
Source:

[https://www.fhwa.dot.gov/planning/national\\_highway\\_system/](https://www.fhwa.dot.gov/planning/national_highway_system/)

# National Highway System Inventory

- ▶ Notes: Insert map of NHS in your State here
- ▶ Add bullets about NHS in your State, including:
  - ▶ lane-miles of NHS in the State?
  - ▶ lane-miles owned/managed by DOT?
  - ▶ lane-miles owned/managed by local agencies?
  - ▶ Number of NHS bridges in the State
  - ▶ NHS bridges managed by DOT versus other agencies including Federal agencies

# Locally Owned NHS by State(Centerline)



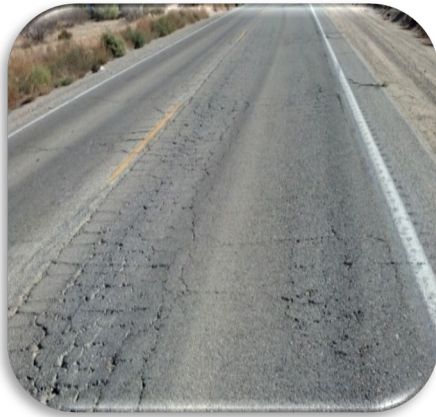
# Pavement and Bridge (PM2) Performance Measures

# TAMP & Target Setting

- ▶ The rules require the implementation of Performance Management which requires performance targets to be set using the National Measures (PM2)
- ▶ PM2 targets for pavement are set based on factors including current conditions, needs assessment, and financial estimates
- ▶ PM2 targets for bridges are set based on factors including age, current conditions, performance cost curves, and financial estimates
- ▶ MPO's can adopt the state targets or set their own

# Measuring Pavement Condition

- ▶ Pavement Roughness - International Roughness Index (IRI) for both concrete and asphalt pavements
- ▶ Other distresses measured for concrete and asphalt



Cracking - All  
Pavement types



Rutting - Asphalt  
Pavements



Faulting - Concrete  
Pavements



# Pavement Data Collection

- ▶ Note: Include a picture of the equipment used by your DOT to collect pavement condition data
- ▶ Add a bullet on the frequency of data collection and the approach you follow to collect the data,

# Pavement Condition Rating Matrix

Performance Parameter	Good	Fair	Poor
IRI (inches per mile)	Less than 95	95 to 170	Greater than 170
Cracking (percent)	Less than 5 percent	5 to 20 percent depending on pavement type	10 to more than 20 percent depending on pavement type
Rutting (inch)	Less than 0.2	0.2 to 0.4	Greater than 0.4
Faulting (inch)	Less than 0.1	0.1 to 0.15	Greater than 0.15

# Pavement Condition Performance

- ▶ Measuring distresses for condition ratings:
  - ▶ **GOOD:** All distresses are exhibiting “good” ratings
  - ▶ **POOR:** Two or more distresses are exhibiting “poor” ratings
  - ▶ **FAIR:** All other combinations

# State DOT's Pavement Measures & Targets

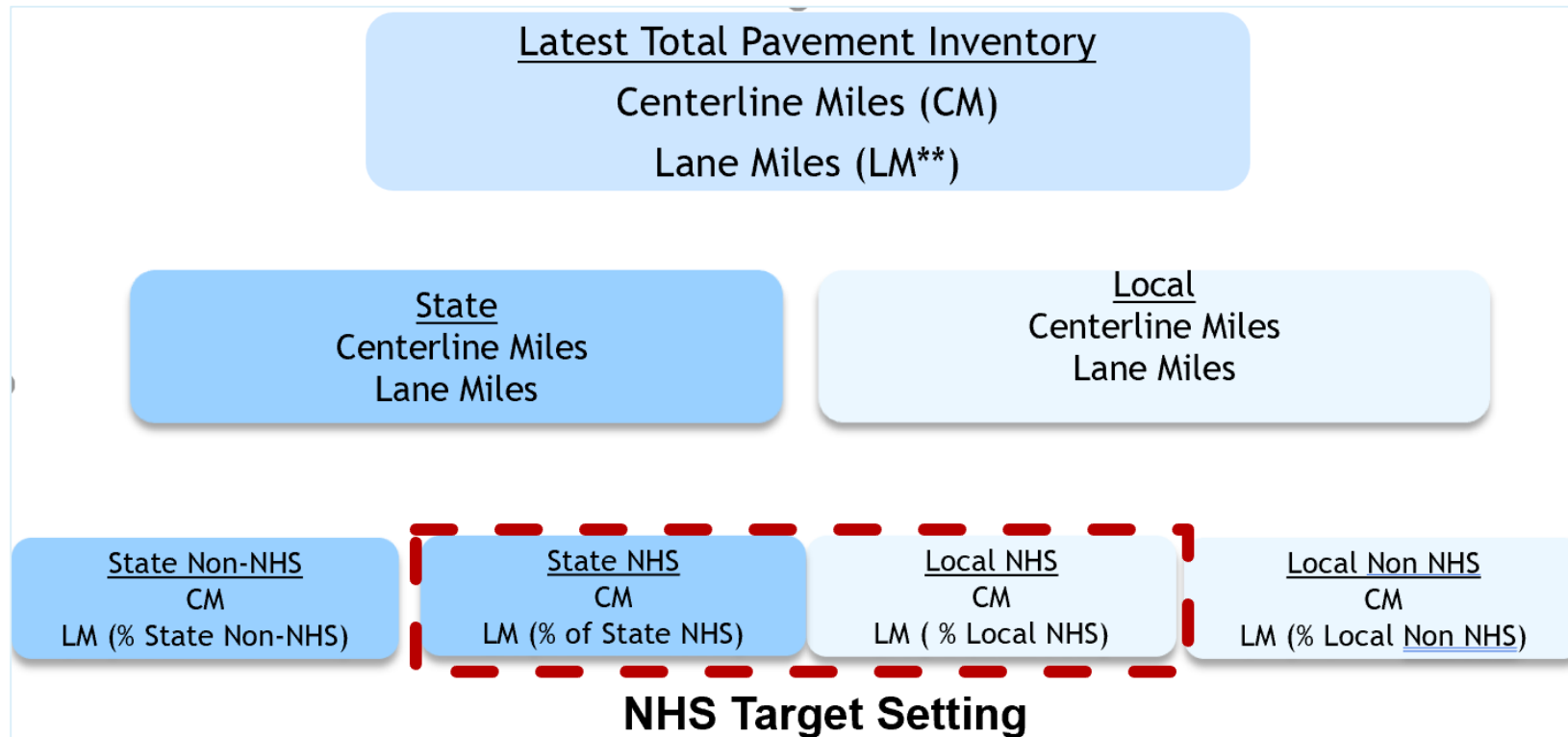
State DOTs have to report the following:

- ▶ Percent of Interstate System in Good Condition
- ▶ Percent of Interstate System in Poor Condition
- ▶ Percent of non-Interstate NHS in Good Condition
- ▶ Percent of non-Interstate NHS in Poor Condition

# Interstate Targets and Performance

- ▶ Lane-Miles of Interstate Pavements
  - ▶ Centerline miles
  - ▶ Lane-miles
- ▶ Performance of Interstate Pavements
  - ▶ No more than 5% of the Interstate in Poor condition
  - ▶ State DOT Interstate % Poor = Include State specific information here

# Pavement Inventory

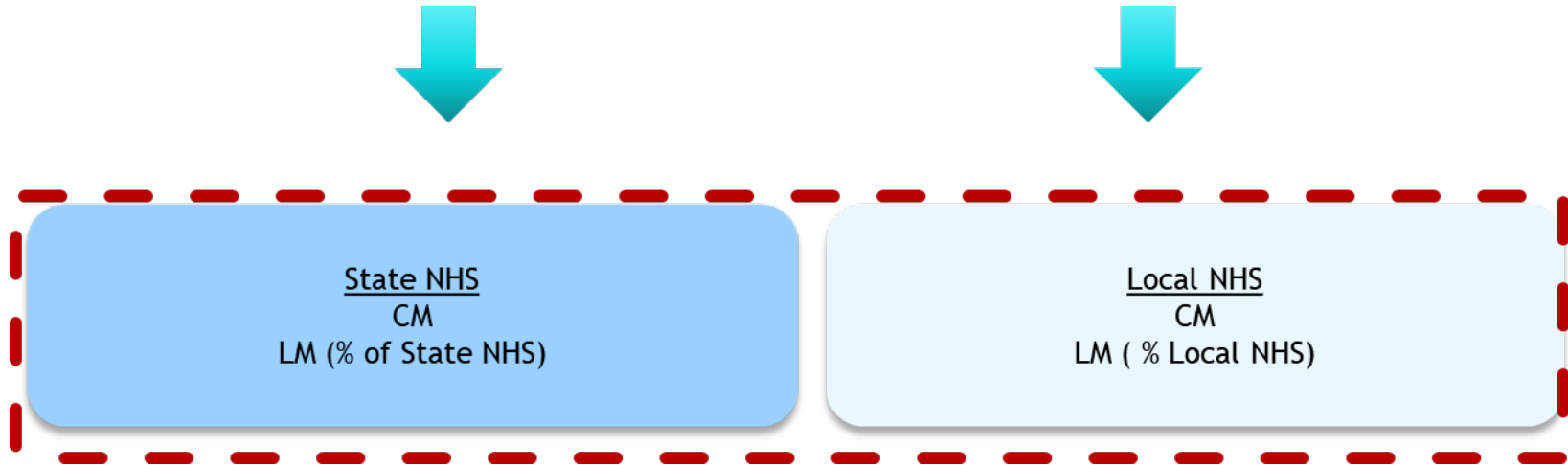


Note:

\*\* Lane Miles (LM) represents the measures for the NHS

\*\*Source: Indicate year of HPMS data used

# NHS Pavement Target Setting

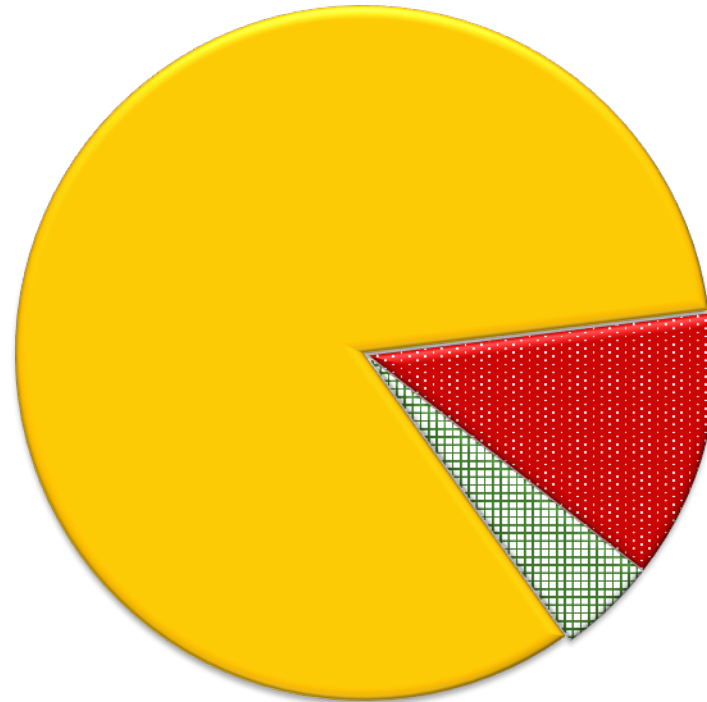


State DOT's 2-year and 4-year targets for Interstate and Non-Interstate NHS in Good condition

State DOT's 2-year and 4-year targets for Interstate and Non-Interstate NHS in Poor condition

# Interstate Pavement Condition

State DOT Pavements

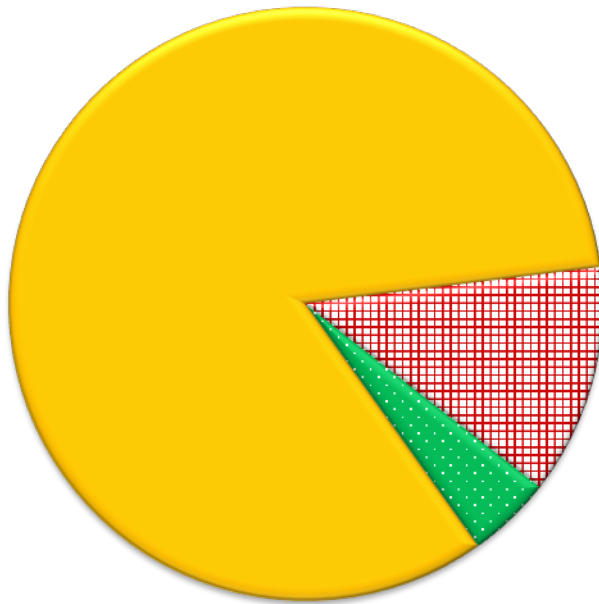


■ Good ■ Fair ■ Poor



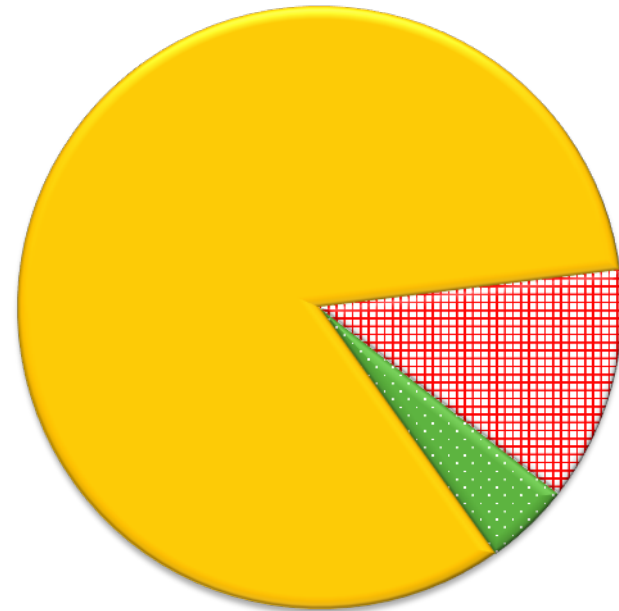
# NHS Pavement Condition

State DOT Pavements



■ Good ■ Fair ■ Poor

Local Pavement



■ Good ■ Fair ■ Poor

# Inspecting and Collecting Bridge Data

- ▶ DOT owned NHS bridges are inspected every 2 years
- ▶ Local NHS bridges are inspected by local agencies every 2 years
- ▶ Additional inspections conducted by the State DOT are as follows:
  - ▶ Scour critical bridges - every x years
  - ▶ Culvert (span not more than 20 feet) inspections - every y years
  - ▶ Bridges in earthquake or other areas inspected every z years
- ▶ Conditions are assessed on all major components of the bridge using AASHTO and FHWA criteria

# Bridge Inventory

Total NBI Inventory  
Number of Bridges  
Bridge Deck (SF)

DOT  
Number of Bridges  
Bridge Deck (SF)

Local  
Number of Bridges  
Bridge Deck (SF)

DOT Non-NHS  
Number of Bridges  
Bridge Deck (SF)

DOT NHS  
Number of Bridges  
Bridge Deck (SF))

Local NHS  
Number of Bridges  
Bridge Deck (SF)

Local Non-NHS  
Number of Bridges  
Bridge Deck (SF)

**NHS Target Setting**

# NHS Bridge Targets

DOT NHS  
Number of Bridges  
Bridge Deck (SF)

Local NHS  
Number of Bridges  
Bridge Deck (SF)

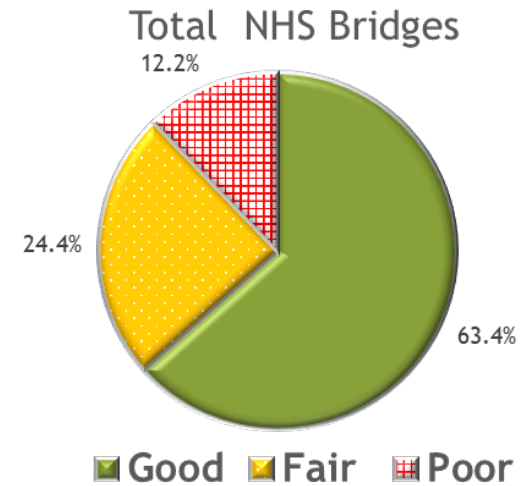
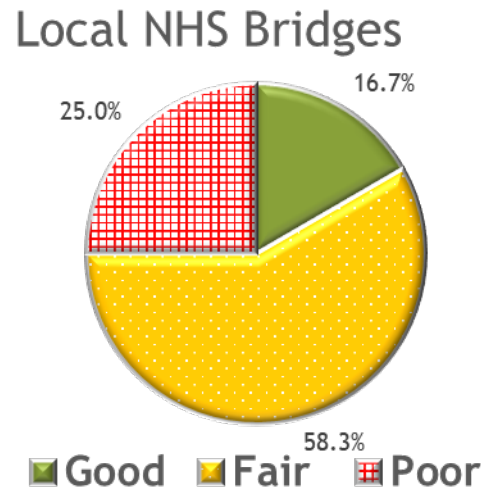
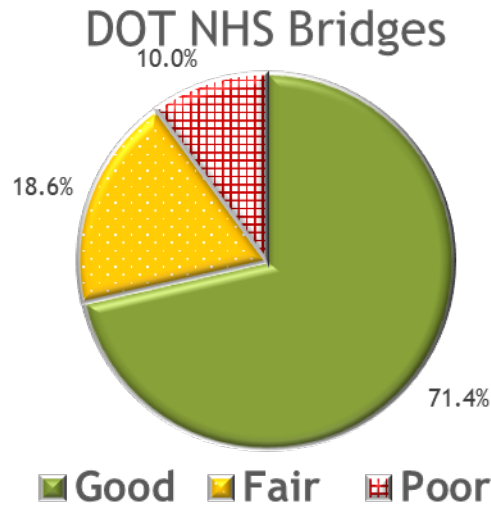
# Measuring Bridge Conditions

- ▶ Conditions are assessed on all major components of the bridge using AASHTO and FHWA criteria
- ▶ A bridge is rated Poor if any one of 1) Deck, 2) Substructure, or 3) Superstructure is rated Poor
- ▶ A zero (low) to 9 (high) scale is used to assess condition of each major component.

# NHS Bridge Performance

NBI Condition Rating	Condition Classification	State Bridges (numbers)	State Bridges (deck area 1000 SF)	Local Bridges (numbers)	Local Bridges (Deck area 1000 SF)	Total Deck Area (%)
9	Good					
8						
7						
6	Fair					
5						
4	Poor					
3						
2						
1						
0						

# NHS Bridge Inventory (Deck Area)



# MAP-21 Bridge Minimum Thresholds

- ▶ Percentage of the deck area of NHS bridges classified as Poor does not exceed 10.0 percent
- ▶ This includes on-ramps and off-ramps connected to the NHS within a State, and bridges carrying the NHS that cross a State border
- ▶ The calculation of Poor determined by multiplying the length and width of all bridges
- ▶ Then, the amount of area that is Poor is divided by the total bridge area



# Bridge Targets per Transportation Asset Management Plan

- ▶ In this slide, include your agency's bridge targets that are referenced in your asset management plan.
- ▶ Include any other relevant information regarding your targets, such as whether your agency has achieved its targets.

# In Closing

- ▶ Asset Management is about managing our infrastructure cost effectively over its whole life
- ▶ It is about extending the asset's life by appropriate and timely treatments that are cost effective
- ▶ It enables us to manage our assets responsibly.
- ▶ It also enables us to show to the public and other stakeholders how our agency is using taxpayer monies responsibly to manage one of the nation's biggest assets