

## Transportation Performance Management

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# ***Overview of Performance Measures: Pavement Condition to Assess the National Highway Performance Program***

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U.S. Department of Transportation  
Federal Highway Administration



## *Lessons*

- **Lesson A:** TPM Legislative and Regulatory Requirements for Pavements
- **Lesson B:** Relating Pavement Performance to Planning, Asset Management and Existing Pavement Programs
- **Lesson C:** National Pavement Performance Measures
- **Lesson D:** Calculating Pavement Performance Targets
- **Lesson E:** Reporting, Accountability and Transparency



# *Acronyms*

- NHPP: National Highway Performance Program
- NHS: National Highway System
- TPM: Transportation Performance Management
- TAMP: Transportation Asset Management Plan
- PBPP: Performance Based Planning and Programming
- HPMS: Highway Performance Monitoring System
- PMS: Pavement Management System
- IRI: International Roughness Index
- PSR: Present Serviceability Index
- HMA: Hot-Mix Asphalt
- JCP: Jointed Concrete Pavement
- CRCP: Continuously Reinforced Concrete Pavement



# *Lesson A: TPM Legislative and Regulatory Requirements for Pavements*

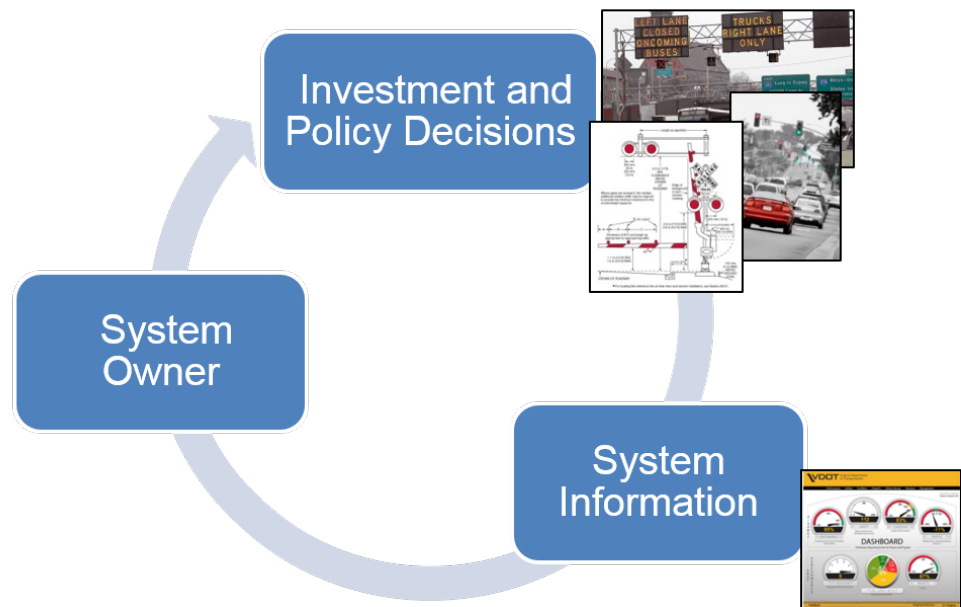


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# Transportation Performance Management (TPM)

A strategic approach that uses system information to make investment and policy decisions to achieve transportation system performance goals

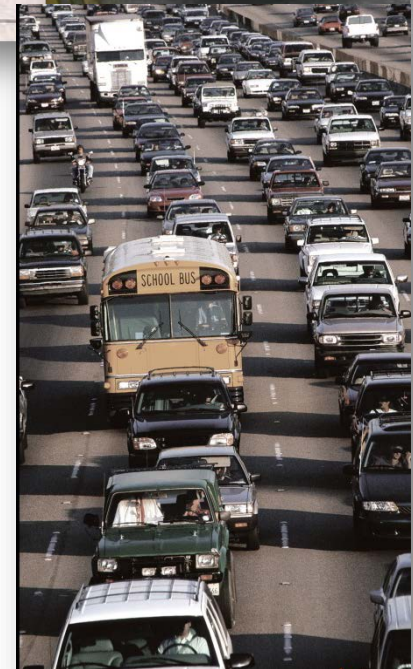


# ***TPM Elements***



## ***National Goals***

- Safety
- **Infrastructure Condition**
- Congestion Reduction
- System Reliability
- Freight Movement and Economic Vitality
- Environmental Sustainability
- Reduced Project Delivery Delays



## *Applying the Framework*

National goals defined in MAP-21  
& FAST Acts

National measures established  
by USDOT

State and MPO targets developed to track  
measures in each performance area

States and Metropolitan Planning  
Organizations (MPOs) report targets  
and their progress toward them

FHWA assesses progress





# Measures

## Key Terms

### Measure

Expression based on a metric that is used to establish targets and to assess progress toward achieving the established targets

**Example for Pavements:** % of lane-miles of pavements in “Good” condition

### Metric

Quantifiable indicator of performance or condition

**Example for Pavements:** Is the pavement doing what it is supposed to do (IRI) and is it in need of major investment (Distresses)

### Target

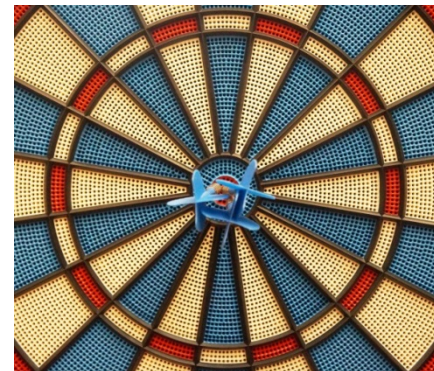
Quantifiable level of performance or condition, expressed as a value for the measure, to be achieved within the time period.

**Example for Pavements:** No more than X% of Interstate pavement in Poor Condition by 2020



# Targets

- Once set, targets specify a level of performance that the agency expects to achieve
- To set targets, agencies follow structured process to:
  - Identify and prioritize needs
  - Allocate resources to best meet those needs
  - Select projects that best achieve desired outcomes



# Targets

Other benefits of targets:

- Clarify the outcomes the agency is trying to achieve
- Help manage expectations
- Highlight how resources are being used
- Expose data issues



# Targets – Virginia DOT (VDOT) Example

Virginia.gov Online Services | Commonwealth Sites | Help | Governor Search Virginia.gov GO

**VDOT** Virginia Department of Transportation

Performance Safety **Condition** Projects Citizen Survey Finances Management

HOME HELP QUICK START FEEDBACK

Garrett W. Moore, P.E. Deputy Commissioner Chief Engineer Kevin Gregg State Maintenance Engineer Kendal R. Walus, P.E. State Structure and Bridge Engineer

## Condition

District:  Counties  Residencies  Cities Road System

All Districts All Counties All Road Systems

Pavement Condition	Bridge Condition	Ride Quality						
Target 82%	Target 92% Non-Red (Non-SD)	Target 85%						
	<table border="1"> <tr> <td><b>R</b></td> <td>1237</td> </tr> <tr> <td><b>Y</b></td> <td>4967</td> </tr> <tr> <td><b>G</b></td> <td>14899</td> </tr> </table>	<b>R</b>	1237	<b>Y</b>	4967	<b>G</b>	14899	
<b>R</b>	1237							
<b>Y</b>	4967							
<b>G</b>	14899							
Current: 82% Last Year: 83%	Green and Yellow Percent: 94.1%	Current: 88% Last Year: 88%						



## *Plans*

- TPM requirements specify how planned targets need to be communicated to FHWA
- Other related documents detailing planned performance:
  - Long-range transportation plans
  - Asset management plans



# Reports

- TPM reports
  - Baseline Performance Period Report
  - Mid Performance Period Progress Report
  - Full Performance Period Progress Report
- States may have additional reports to communicate performance to their stakeholders and the public



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## ***Accountability and Transparency***

### **States shall set Targets for:**

- National Highway Performance Program (NHPP)
- Highway Safety Improvement Program (HSIP)
- Congestion Mitigation and Air Quality Program (CMAQ)
- National Highway Freight Program (NHFP)

### **Minimum standards are established for:**

- Interstate pavements
- National Highway System (NHS) bridges



## *Class Discussion: Use of TPM*

- What TPM elements are already used by your agency?
- What goals, objectives, measures and targets are already used by your agency?



### Worksheet 1



## ***Class Discussion: Use of TPM***

<b>Performance Measure</b>	
Calculation Approach	
Example of Target Setting Using the Pavement Measure	
Examples of Use to Support Decision Making	

# ***Lesson B: Relating Pavement Performance to Planning, Asset Management and Existing Pavement Programs***



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## *Pavement TPM Regulations*

- Detailed in “National Performance Management Measures for Assessing Pavement Condition,” 23 CFR 490 Subpart C
- Establishes measures for State DOTs and MPOs to use to carry out the NHPP and to assess progress on achieving condition targets for NHS pavements
- Establishes minimum condition requirements for Interstate pavements



# ***Pavement TPM Regulations: Performance Measures***

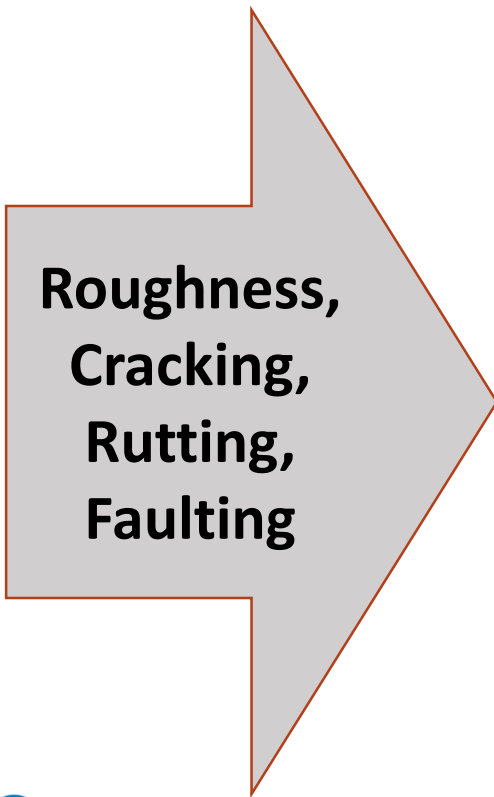
<b>Performance Target</b>	<b>Interstate Condition</b>	<b>Non-Interstate NHS Condition</b>
<b><i>Two-year</i></b>	% Good	% Good
	% Poor	% Poor
<b><i>Four-year</i></b>	% Good	% Good
	% Poor	% Poor

## ***Pavement TPM Regulations: Calculating Metrics and Measures***

- Highway Performance Monitoring System (HPMS) data used by FHWA to calculate good/poor metrics and measures
- Combines consideration of roughness, cracking and rutting/faulting
  - Present Serviceability Rating (PSR) for lower speed roads
- Measures aggregated by lane miles
- HPMS pavement data collection requirements revised to require more comprehensive collection of data for NHS routes



# ***Pavement TPM Regulations: Required Data Reporting***



**Interstate**

**Non-Interstate**

**April 15**

**June 15**

***Due Date***

**Every Year**

**2 Years**

***Frequency***

**Full Extent  
1 Lane  
1 Direction**

**Full Extent  
1 Lane  
1 Direction**

***Coverage***

## ***Pavement TPM Regulations: Target Setting & Reporting***

- State Biennial Performance Report (State 150(e) report) includes:
  - Baseline Performance Report
  - Mid Performance Period Progress Report
  - Full Performance Period Progress Report
- MPO reports included in metropolitan transportation plans

# ***Pavement TPM Regulations: Interstate Minimum Condition and Penalty***

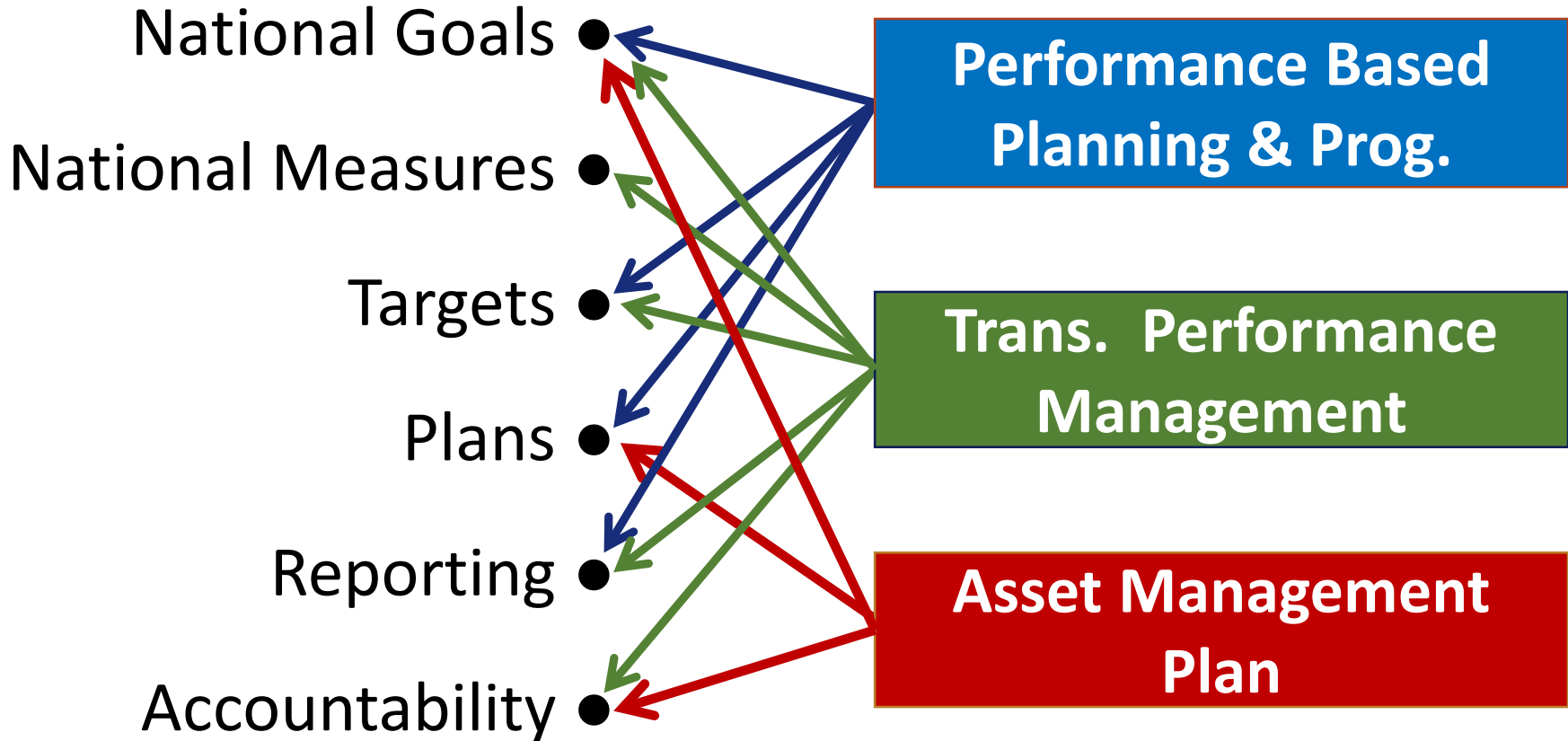
- A minimum pavement condition for the Interstate System is no more than 5% in Poor condition
- FHWA will assess this minimum condition annually, using data in the HPMS as of June 15
- If the minimum condition threshold is not met, the penalty is that the State must obligate a specified percentage of its NHPP and Surface Transportation Program (STP) funds to address Interstate conditions
- 1<sup>st</sup> assessment will occur in 2019

June						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

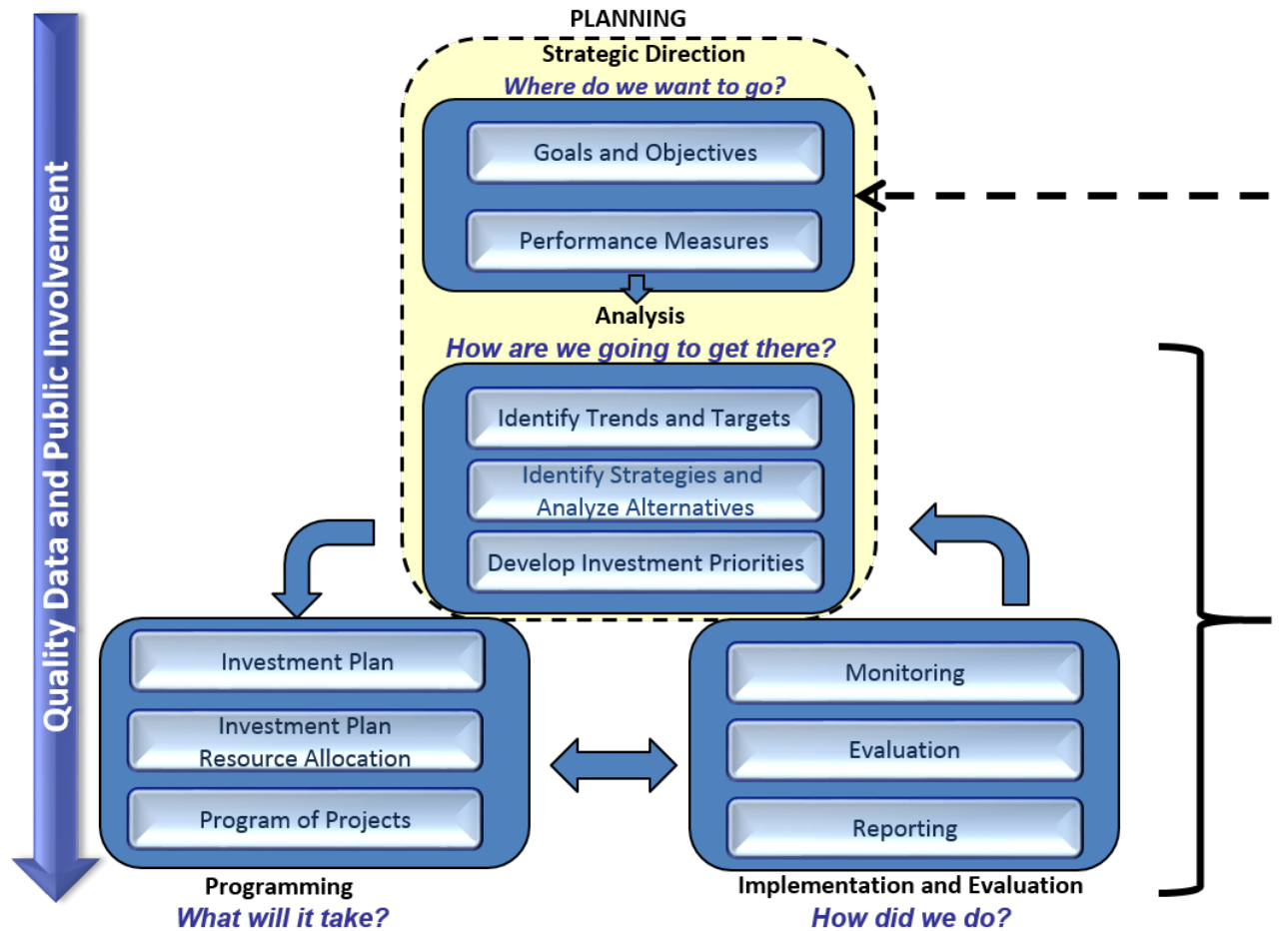




# Linking TPM to PBPP and AM



# Performance Based Planning and Programming (PBPP) Guidebook



## ***Pavement Performance-Related Requirements***

- Pavement TPM regulations (23 CFR 490)
- National Highway Performance Program (NHPP) (23 USC 119 )
- Asset Management Plan Rule (23 CFR 515)
- Relationship of TPM to performance-based planning and programming (PBPP) (23 CFR 450 and 49 CFR 613)
- Highway Performance Management System (HPMS) Field Manual (23 CFR 490)



# *Asset Management*

“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 life cycle of the assets at minimum practicable cost”



# Asset Management Plan

Addresses issues and challenges to answer critical questions, including how will we:

...improve **investment strategies** for operations and capital improvement?

...manage infrastructure performance **10 years from now?**

...make sure infrastructure can endure **extreme weather events?**

...ensure **long-term funding to achieve and sustain a state of good repair?**

...choose **priorities in funding?**

...make the **right decisions?**

...manage risks to system performance and condition of assets

...prevent **unwarranted debt for our children?**

## ***Pavement-Related Contents of Asset Management Plan***

- Asset management objectives
- Pavement performance measures and targets
- Listing of NHS pavements and their current conditions
- Performance gap identification
- Life-cycle planning
- Risk management analysis
- Financial plan
- Investment strategies

# *Pavement Management System Requirements*

- Supporting management of inventory and inspection data
- Forecasting deterioration
- Supporting life-cycle benefit/cost analysis for alternative investment strategies
- Identifying short- and long-term budget needs
- Determining optimal investment strategies
- Recommend programs and implementation schedules

## ***Relationship of Pavement Performance to PBPP Practices and Asset Management***

- Pavement performance measures and targets will be detailed in the progress reports
- Asset management plans incorporate the same measures and targets as those in the performance progress report
- States coordinate development of targets with long-range planning processes
- MPOs will use their four-year targets in metropolitan transportation plans





# The Relationship

## Pavement & Bridge Measures

- FHWA establish consistent performance measures across NHS
- Minimum condition standards for Interstate pavements and NHS bridges
- States and MPOs set performance targets
- States collect and report data

## Asset Management Plan

- Incorporates State objectives, measures, and targets
- Perform gap, whole-life cost, and risk analysis
- Develop decision-making and investment strategies

## Performance-Based Planning

- States and MPOs focus on national goals
- Develop strategy and targets
  - Focus on performance areas
  - Determine trade-offs
- Develop program
  - Develop STIP/TIP with targets
- Reporting and transparency
  - Deliver projects and strategies
  - States and MPOs report on performance



## ***Knowledge Check 1***

- What performance measures are required for pavements?

*% in good and poor condition  
for Interstates and non-Interstate NHS*



## *Knowledge Check 2*

In the target setting process for NHS pavements, how long is the performance period?

- A. 1 year
- B. 2 years
- C. 4 years
- D. 10 years



## *Knowledge Check 3*

### **True/False:**

- States should coordinate with MPOs on setting targets

*True*

- States should set only statewide targets

*False*



## *Knowledge Check 4*

### **True/False:**

A pavement management system is required for development of the performance-based asset management plan.



*True*



## ***Knowledge Check 5***

What is the application of TPM to the transportation planning and programming process?



*Performance-based planning  
and programming (PBPP)*

What is the application of TPM to managing transportation system physical assets?

*Asset Management*



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## *Class Discussion*

What is the status of your State's efforts to set pavement performance targets and develop a transportation asset management plan?



*Questions?*





# *Lesson C: National Pavement Performance Measures*



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# ***Pavement TPM Regulations: Performance Measures***

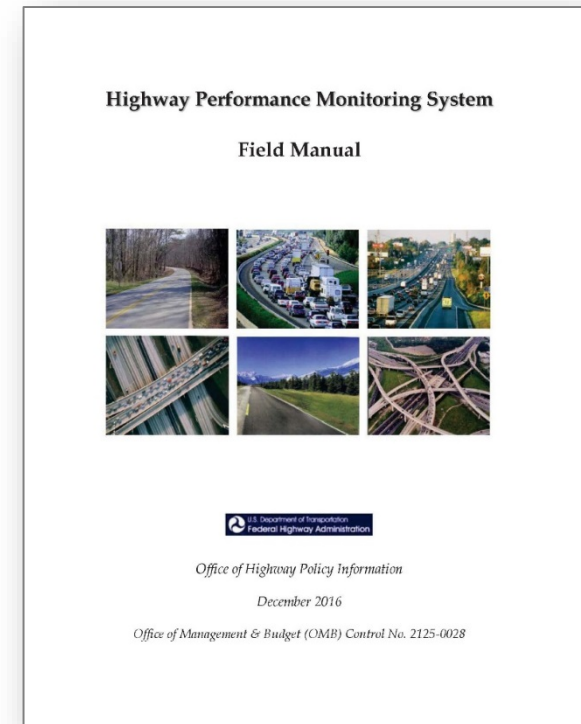
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	% Poor	% Poor

## ***Supporting Systems: Pavement Management System (PMS)***

- Collect, process, store and update pavement inventory and conditions
- Forecast pavement deterioration
- Determine benefit-cost over the life cycle of pavements to determine alternative strategies
- Identify short- and long-term budget needs
- Determine strategies for project selection that maximize overall program benefits
- Recommend pavement programs and schedules within policy and budget constraints

## *Supporting Data Systems: HPMS*

- Official Federal source of data on the extent, condition, performance, use and operating characteristics of the nation's highways
- Populated by States using each State's linear referencing system
- Data requirements in the *HPMS Field Manual, December 2016 version*



# *Data Needed for Calculating the National Pavement Measures*

## **Inventory Data:**

- NHS extent
- Section length
- Facility Type
- Through lanes
- Functional system
- Surface type
- Structure type



## ***Data Needed for Calculating the National Pavement Measures***

### **Condition Data:**

- Roughness (IRI)
- Rutting (asphalt pavements only)
- Cracking
- Faulting (concrete pavements only)
- Can use Present Serviceability Rating (PSR) only where speed limit < 40 mph

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## *Determining Condition for a Section*

- Evaluate each of the metrics for the section to determine whether the section is good, fair or poor with respect to:
  - Asphalt: IRI, rutting, cracking %
  - JCP: IRI, faulting, cracking %
  - CRCP: IRI, cracking %
- Determine overall condition for the section based on the number of metrics that are good, fair and poor

# Pavement Condition Thresholds

	Good	Fair	Poor
<b>IRI (inches/mile)</b>	<95	95-170	>170
<b>Rutting (inches)</b>	<0.20	0.20-0.40	>0.40
<b>Faulting (inches)</b>	<0.10	0.10-0.15	>0.15
<b>Cracking (%)</b>	<5	5-20 (asphalt) 5-15 (JCP) 5-10 (CRCP)	>20 (asphalt) >15 (JCP) >10 (CRCP)



# Calculation of Pavement Measures

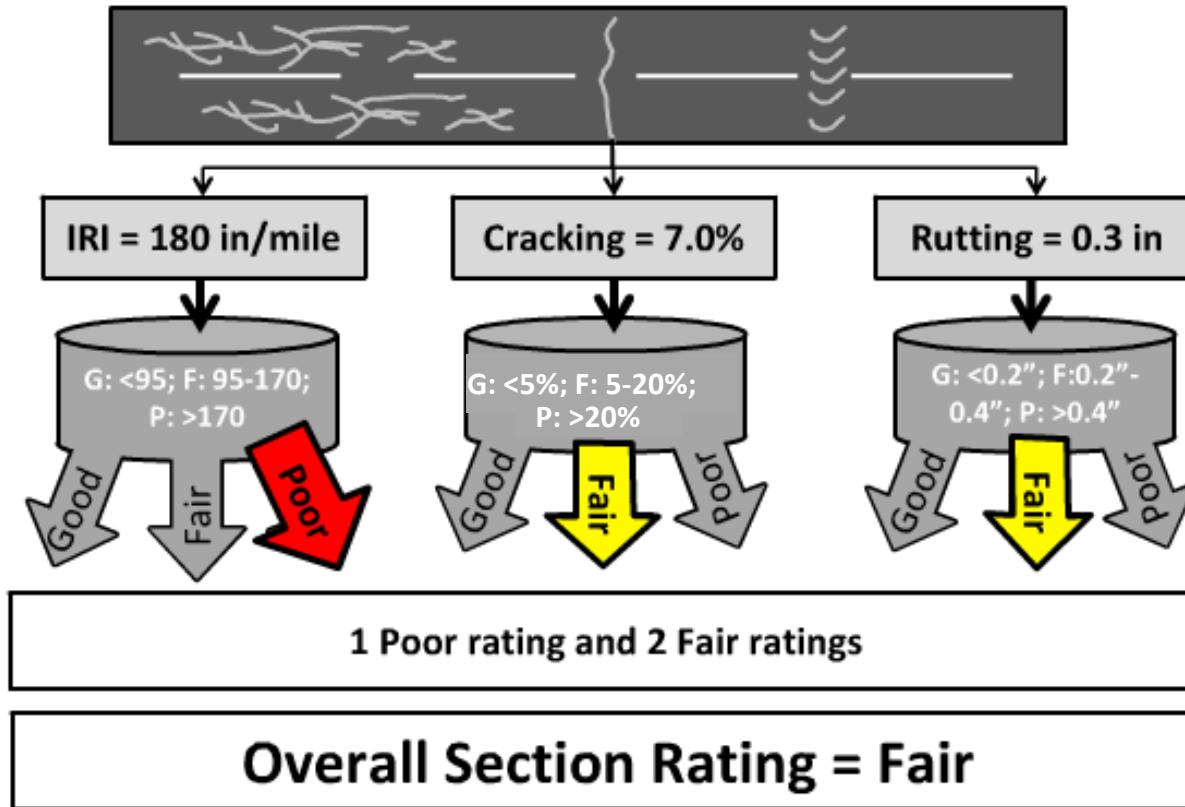
	Pavement Type		Measures
	Asphalt and Jointed Concrete	Continuous Concrete	
Overall Section Condition Rating	3 metric ratings (IRI, cracking and rutting/faulting)	2 metric ratings (IRI and cracking)	
Good	All three metrics rated "Good"	Both metrics rated "Good"	percentage of lane-miles in "Good" condition
Poor	$\geq 2$ metrics rated "Poor"	Both metrics rated "Poor"	percentage of lane-miles in "Poor" condition
Fair	All other combinations	All other combinations	



# Calculation of Pavement Measures

Overall Section Condition Rating	Pavements with Speed Limit less than 40 MPH	Measures
Good	$PSR \geq 4.0$	% of lane-miles in "Good" condition
Poor	$PSR \leq 2.0$	% of lane-miles in "Poor" condition
Fair	$2.0 < PSR < 4.0$	

# Pavement Metric Rating Example: Asphalt Surfaces, Interstate



## ***Small-Group Exercise***

Purpose: Calculate pavement condition using the national pavement metrics and measures

Timing: 15 minutes

Tasks:

1. Evaluate whether each section is in good, fair or poor condition
2. Enter the total lane miles in good, fair and poor condition
3. Calculate the % of lane miles in good, fair and poor condition



**Worksheet 2**

# Small-Group Exercise - Review

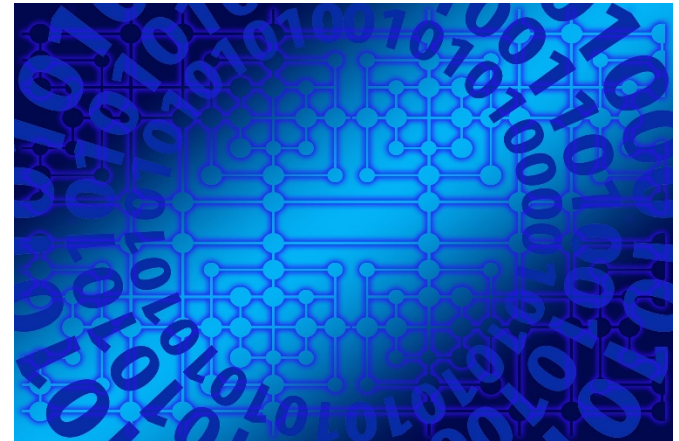
Sec.	Type	Speed Limit (mph)	Lanes	IRI	Cracking	Rutting	Faulting	PSR	Good Fair/ Poor
1	Asphalt	55	4	180	7	0.30	N/A	N/A	Fair
2	Asphalt	65	8	83	3	0.17	N/A	N/A	Good
3	Jointed Concrete	55	2	212	8	N/A	0.18	N/A	Poor
4	Asphalt	45	4	216	13	0.22	N/A	N/A	Fair
5	CRCP	45	4	37	4.9	N/A	N/A	N/A	Good
6	Asphalt	30	2	160	21	0.41	N/A	N/A	Poor
7	Asphalt	65	6	99	4	0.15	N/A	N/A	Fair
8	CRCP	55	2	172	11	N/A	N/A	N/A	Poor
9	Jointed Concrete	55	4	98	4	N/A	0.08	N/A	Fair
10	Asphalt	30	4	N/A	N/A	N/A	N/A	3.0	Fair
<b>Description</b>				<b>Good</b>	<b>Fair</b>	<b>Poor</b>	<b>Total</b>		
<b>Lane Miles</b>				1.2	2.2	0.6	4.0		
<b>% of Lane Miles</b>				30	55	15	100.0		



# *Pavement Performance*

Depends on:

- Complete data
- Quality data
- Timely HPMS reporting



## *Handling Missing Data*

- Excessive missing, invalid or unresolved data may result in misrepresenting pavement conditions
- Sections with missing data are excluded from performance measure calculations
- Reasons for missing data should be coded as specified in the HPMS Field Manual
- % of lane miles with missing data should not exceed 5% of the total
- Sections with bridges and other pavement types are also excluded from the calculations



## *Data Quality Management Plan*

- Addresses the quality of all data collected to report the pavement condition metrics
- Applies to manual and automated data acquisition methods
- States must submit for FHWA approval by May 20, 2018
- Must also submit any significant changes to the plan proposed following its initial submittal





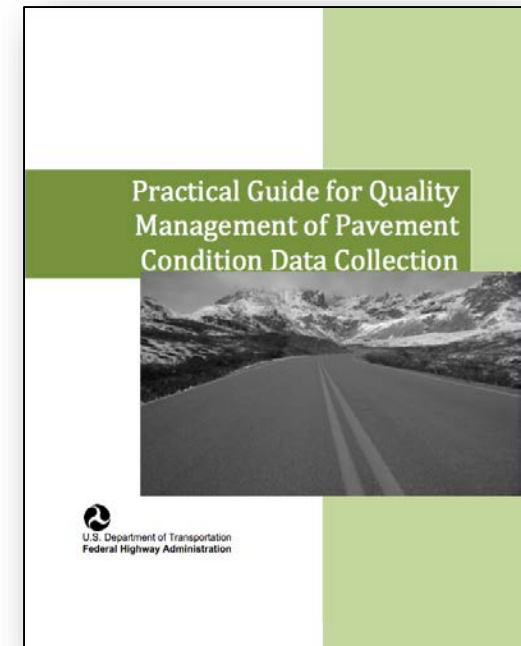
## ***Data Quality Management Plan Requirements***

- Data collection equipment calibration and certification
- Certification process for persons performing manual data collection
- Data quality control measures to be conducted before data collection begins and periodically during the data collection program
- Data sampling, review and checking processes
- Error resolution procedures and data acceptance criteria

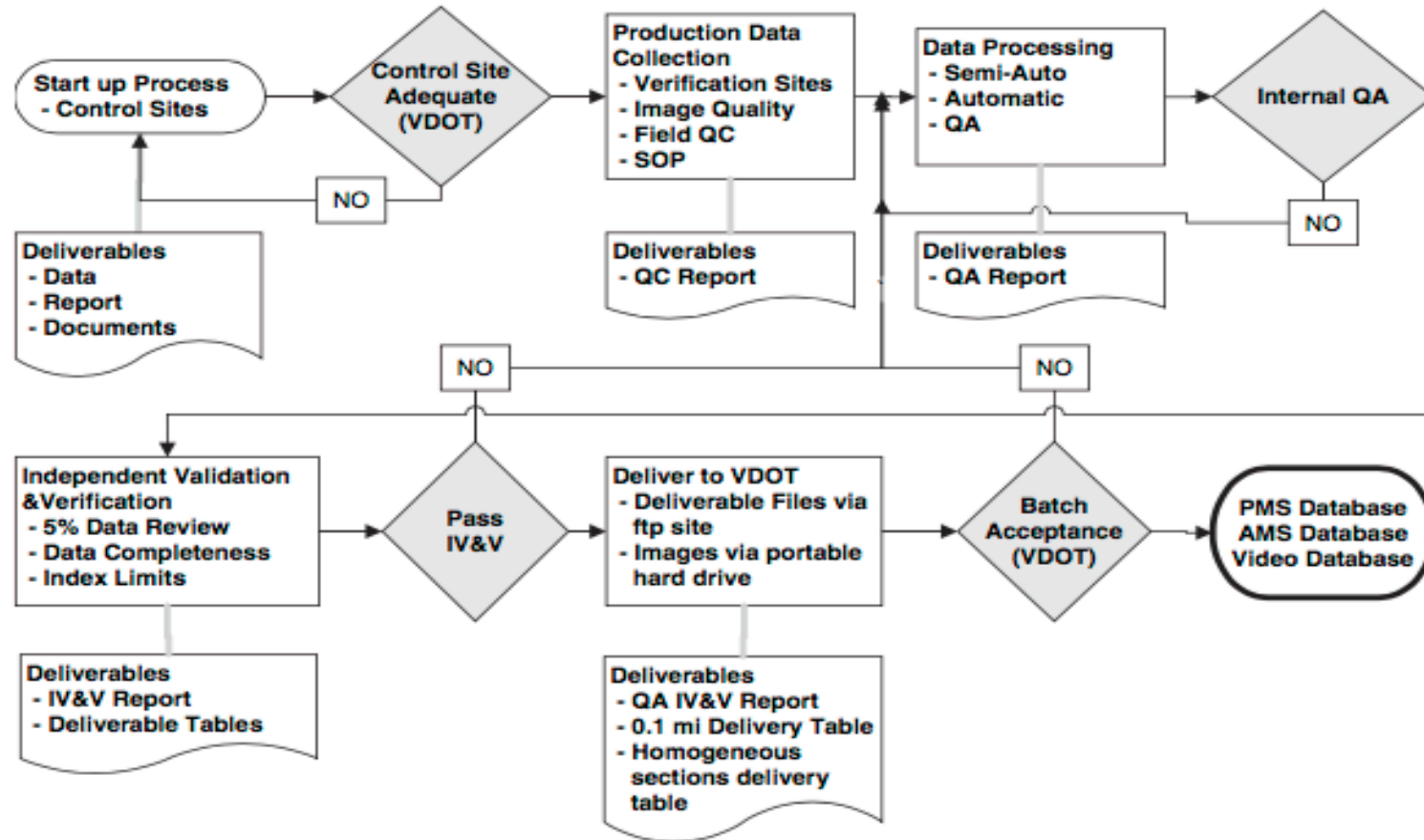


# *Data Management Resources*

- FHWA Practical Guide
  - Detailed guidance on pavement data quality
- NCHRP Synthesis 401
  - Data quality approaches
  - Review of the state of practice
- HPMS materials
  - Guidance on topics including data quality
  - HPMS continuous process improvement model



# Example of Data Quality Process: Virginia DOT



## *Knowledge Check 1*

- What systems, at a minimum, are used to support TPM for pavements?



PMS and HPMS

## Knowledge Check 2

- What metrics are used to determine whether a pavement section is rated as good, fair or poor for sections with a posted speed of 40 mph or greater?
  - For asphalt pavements? IRI, cracking and rutting
  - For jointed pavements? IRI, cracking and faulting
  - For CRCP pavements? IRI and cracking
  - For unpaved or other pavements? None
  - For paved sections with lower speeds?  
Same but PSR may be used as a substitute



## *Knowledge Check 3*

- What is the maximum % of lane miles allowed to have missing, invalid or unresolved data?

5% (excluding bridges and sections that are unpaved or that have other pavement types besides asphalt, jointed concrete and CRCP)



# *Lesson D: Calculating Pavement Performance Targets*



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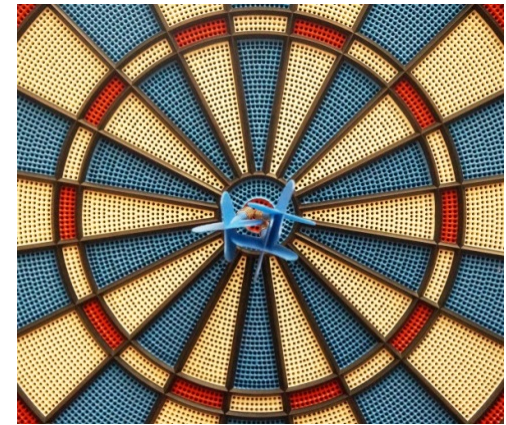
## *Facilitated Class Discussion*

- What data does your agency need to support target setting? What gaps exist? What are the data collection cost implications?
- How is pavement target setting done in your agency? Is there a formal target setting process? What role does pavement management have in the process?
- What are some key factors that may impact the pavement target setting process?

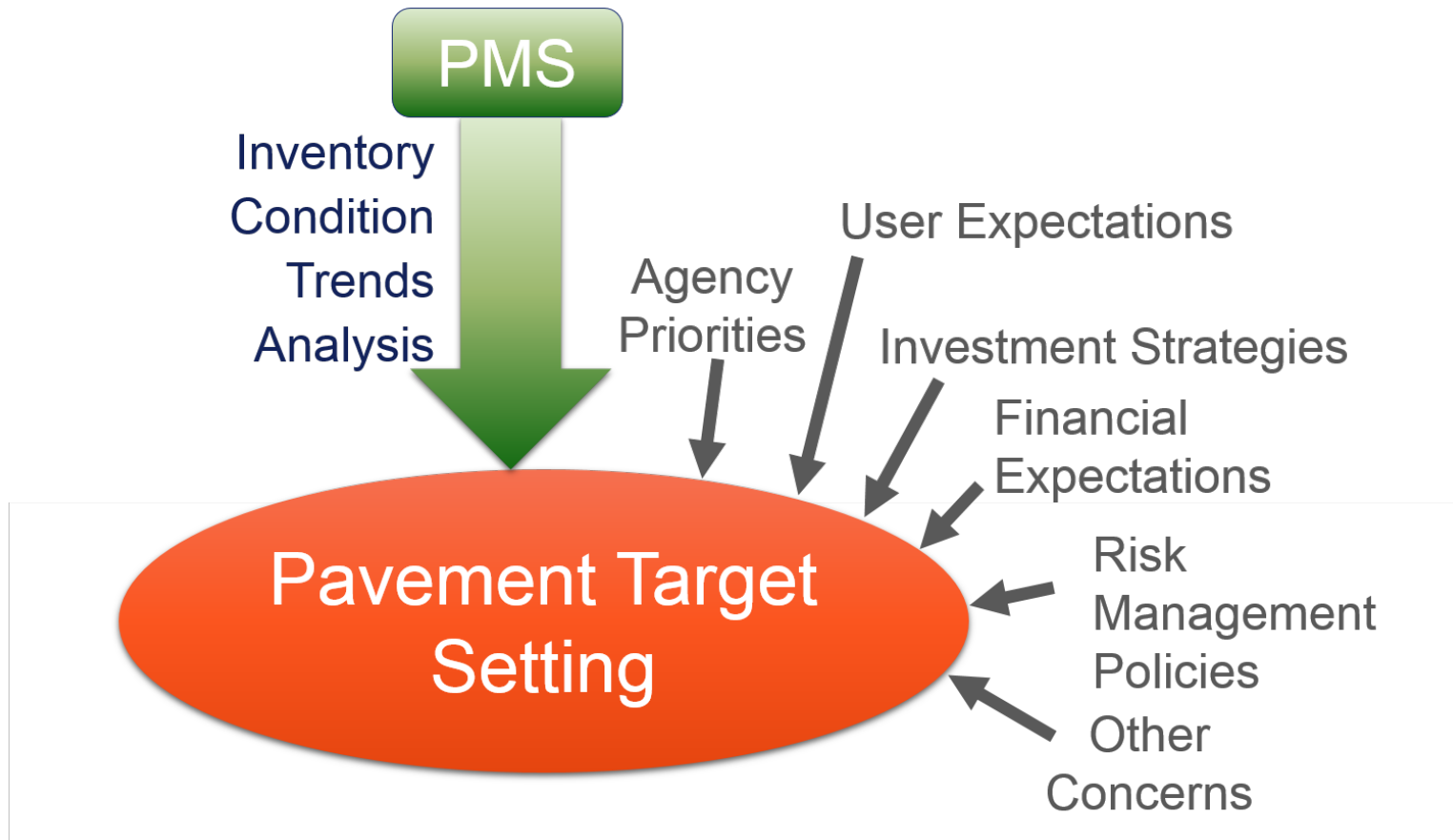


## *Pavement Performance and Condition Targets*

- Specific numerical figures with expected future pavement conditions
- Process varies from State to State
- States and MPOs can set separate targets, but must coordinate
- Target setting is iterative and ongoing



# Overall Pavement Target-Setting Process

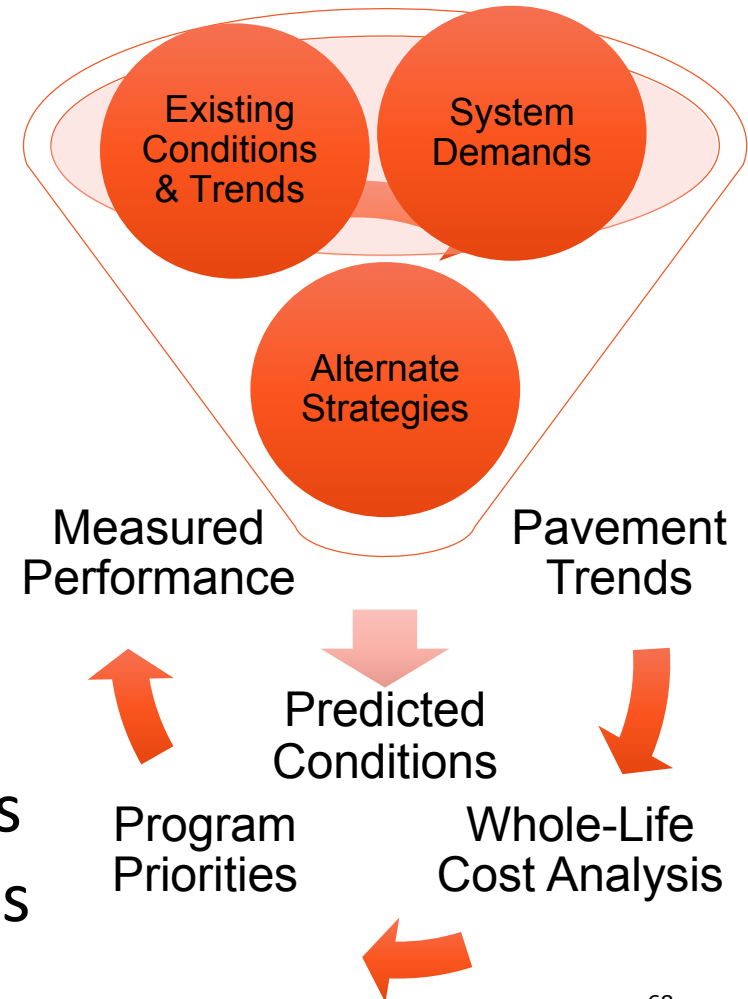


## ***Pavement Performance Data: Supporting Target Setting***

- Available data: What data are available to support predictions of performance?
- Pavement performance trends: What drives anticipated conditions?
- Variability in the data
- Analysis of alternate strategies, costs and timing
- Tolerance for risk

# Recommended Analysis Components

- Determine what drives pavement performance
- Conduct whole-life cost analysis including risk tolerance for alternate strategies
- Identify program priorities given constraints, historical performance, system demands and tradeoffs with other assets



# ***Pavement Investments: Network Level Whole-Life Planning***

- Computing total costs of different strategies for whole-life investment planning:

**1. Establish investment strategy options**

**2. Determine risks and mitigation alternatives**

**3. Estimate resources and constraints**

**4. Compute life-cycle costs for each strategy**

**5. Compare with agency policies**

**ROAD WORK  
NEXT 5 MILES**



## *Analyze and Set Targets*

- Prioritize strategies and trade-offs
- Iterative analysis of performance outcomes/risk management/budget expectations/timing
- Identify policy implications
- Secure buy-in from agency & stakeholders
- Set targets



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## *Tools for Target Setting*

- Every State is required to have a PMS with certain basic analytical functionality
- MPOs and other agencies may need to leverage State PMS resources to support their analyses
- In some cases, the necessary functionality may be provided by a mix of different systems and analytical tools

## *Target-Setting Considerations*

- State DOTs and MPOs typically set long-term targets for steady-state pavement conditions
- Ideally, an agency will make progress toward its long-term planning targets, but short-term performance targets need to consider:
  - Current conditions
  - Pavement strategies
  - Lag between when investments are committed and results visible in the data

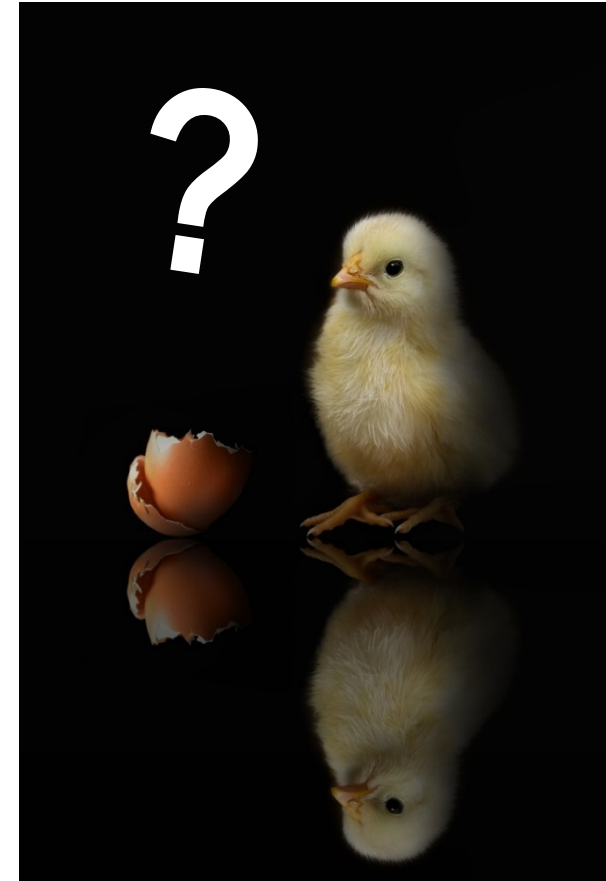


## ***Target-Setting Considerations: Investment Strategy and Targets***

Are pavement targets set based on whole-life strategies, available funds and other factors?

**or**

Are strategies and funds determined based on pavement targets and performance?



# Factors Impacting Performance Target Setting

## Decision-Making Process

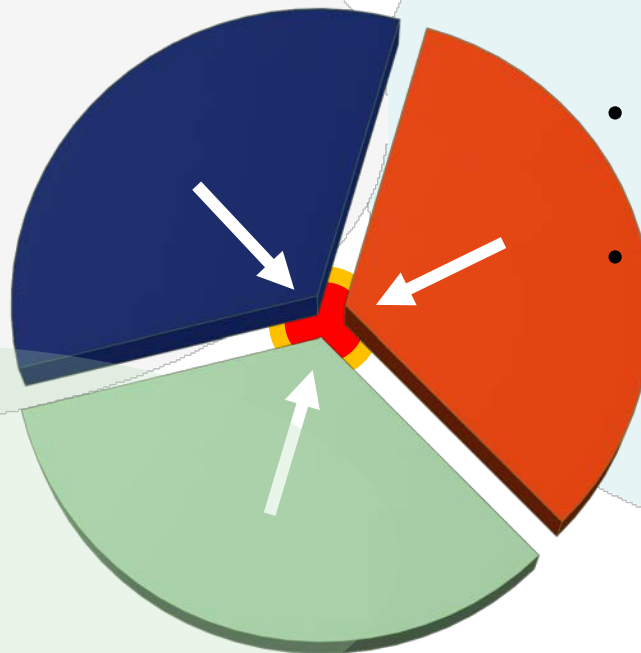
- Relates to long-term planning goals
- Accurate revenue projections
- Timely project delivery
- Good operational management
- Decisions reflect user expectations

## Existing Commitments

- Current programs
- Competing programs

## Staff Capacity and Priorities

- Strong leadership and commitment
- Key people focused on all initiatives
- Strong strategic framework & buy-in
- External communications and internal feedback with asset management and planning



## *Facilitated Class Discussion*

- What data does your agency need to support target setting? What gaps exist? What are the data collection cost implications?
- How has pavement work been prioritized and targets set in the past? Has a formal process been used?



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## *Facilitated Class Discussion*

- How is pavement target setting done in your agency?
- What role does pavement management have in the process?
- What are some key factors that may impact the pavement target setting process?

# *Lesson E: Reporting, Accountability and Transparency*



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## *Definitions and Differences (TPM)*

### **Reporting**

Summary documentation of performance trends for internal and external audiences

### **Accountability**

Evaluation of expectations measured with progress in achieving targets and compliance with minimum condition standards

### **Transparency**

Public availability of understandable information on pavement performance processes



# *Pavement Performance Reporting: What's Required*

## Reports:

- **Baseline** Report by Oct. 1 of the first performance year
- **Mid Period** Progress Report by Oct. 1 of the third performance year
- **Full Period** Progress Report by Oct. 1 of the fifth year **following** the performance period



# Why Report on Performance?

- Evaluate the impact of federal-aid funds on the national goal set for infrastructure condition
- Report to the public on pavement conditions, significant progress and target achievement in each State
- Report to Congress on the condition and performance of the Federal-aid highway system





# What Do You Have to Report?

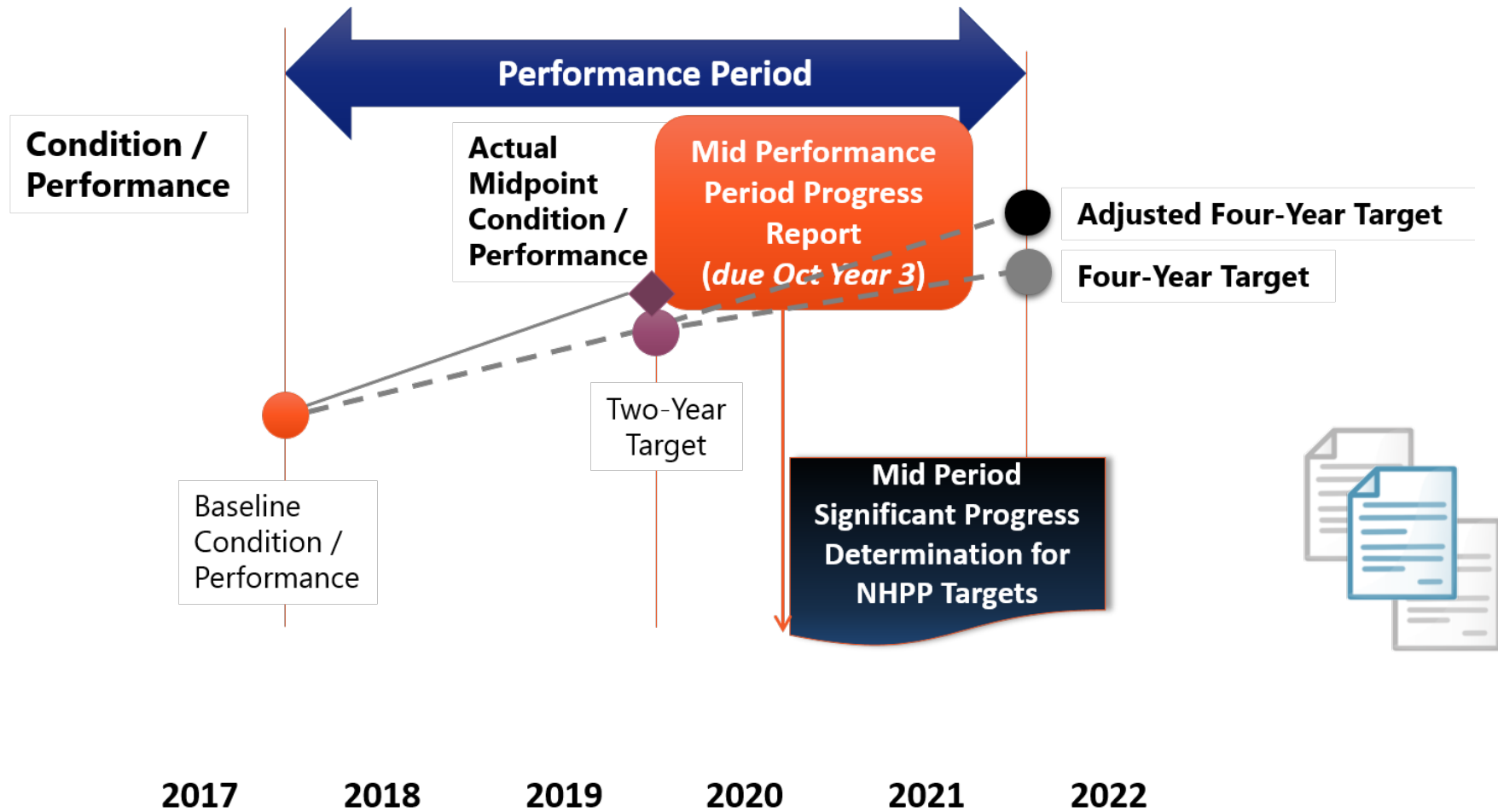
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<i>2-year</i>	% Good	% Good
	% Poor	% Poor
<i>4-year</i>	% Good	% Good
	% Poor	% Poor

## ***Baseline Performance Report***

- First report due Oct. 1, 2018
- Subsequent reports due every 4 years
- Contents related to pavement performance include:
  - Targets: 2-year and 4-year targets
  - Baseline condition/performance
  - Basis for targets, to the maximum extent practicable
  - Baseline conditions as of Jan. 1 of the report year
  - Relationship of targets to: State's long-range plan, State's asset management plan (TAMP) and other plans



# Mid Performance Period Progress Reporting



# *Mid-Performance Period Progress Report*

- First report due Oct. 1, 2020
- Subsequent reports due every four years
- Contents related to pavement performance:
  - Actual conditions as of the midpoint of the four-year performance period
  - Discussion of progress made toward achievement of targets
  - Investment strategy discussion
  - Adjusted four-year targets, if applicable



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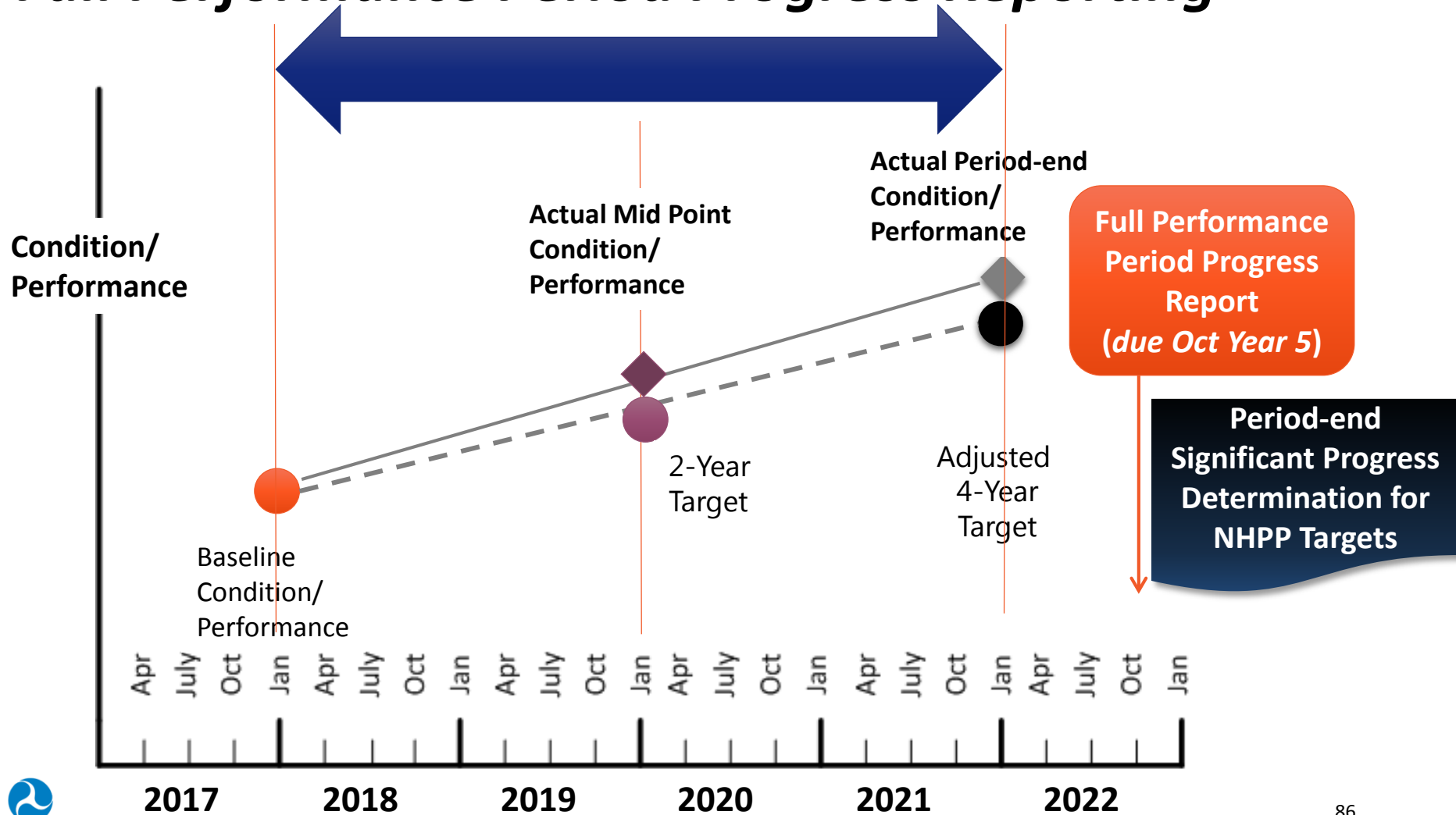
# *Mid Performance Period Progress Report*

Additional contents:

- Two-year significant progress discussion for the NHPP targets
- Extenuating circumstances discussion on NHPP two-year targets
- NHPP target achievement discussion



# Full Performance Period Progress Reporting



# *Full Performance Period Progress Report*

- First report due Oct. 1, 2022
- Subsequent reports due every 4 years
- Contents related to pavement performance:
  - Actual conditions as of the end of the 4-year performance period
  - Discussion of progress in achieving targets
  - Investment strategy discussion



# *Full Performance Period Progress Report*

Additional contents:

- 4-year significant progress discussion for the NHPP targets
- Extenuating circumstances discussion on NHPP 4-year targets
- NHPP target achievement discussion





# Performance Progress Report Contents

Contents	Baseline	Mid Period	Full Period
2-year targets	X		
4-year targets	X		
Basis for targets	X		
Baseline conditions	X		
Ties to other plans	X		
Actual conditions		X	X
Progress discussion		X	X
Investment strategy discussion		X	X
Adjusted four-year targets		X	
Extenuating circumstances		X	X
NHPP target achievement discussion		X	X

## ***MPO Target Setting & Reporting***

- MPOs can choose to set their own targets or support State targets
- If a MPO supports a State four-year target and the State adjusts that target, the MPO has 180 days to:
  - Agree to plan and program projects to contribute to the adjusted target **or**
  - Commit to a new quantifiable MPO target
- MPOs are expected to report baseline conditions and four-year targets in their metropolitan transportation plans



# *Biennial Performance Reporting Process*

- FHWA will have an online portal to provide performance report contents
- Portal will also collect other reporting requirements
- States will be able to describe extenuating circumstances and reasons for meeting or not meeting targets

The screenshot displays the 'Performance Management Form Submission Dashboard' with the following data:

State	Report Year	Description	Performance Period	Report Due Date	Submission Status	InitiatedBy/On	SubmittedBy/On	Action
Pennsylvania	2018	BASELINE PERFORMANCE PERIOD REPORT (BPP)	2018-2021	10/01/2018	Initiated	TVAN 3/30/2017 2:56:17 PM	TVAN 3/30/2017 2:56:17 PM	Edit Delete

Showing 1 to 1 of 1 entries



## Performance Management Form Edit

- 2-year targets
- 4-year targets
- Basis for targets
- Baseline conditions
- Ties to other plans

State	Report	Report Due Date
Alabama	2018	10/01/2018

Overview Attachment **Pavement** Bridge

### - Pavement Performance Overview

#### - Statewide Performance Target for Pavements of the Interstate System in Good condition

\* P3 Please provide the current statewide percentage of pavements of the Interstate System in Good condition.

*Note: Baseline data for the current statewide percentage of pavements of the Interstate System in Good condition is not required for the first performance period.*

\* P4 Please provide the 2-year target for the statewide percentage of pavements of the Interstate System in Good condition that the State DOT has established for the 2018-2021 Performance Period.

*Note: This input is intended to be based on the expected condition/performance of this measure at the end of 2021. For Example, enter 86.5% as 86.5*

\* P6 Please provide a justification and explanation for the 2-year and 4-year targets that the State DOT established for the 2018-2021 Performance Period for the statewide percentages of pavements of the Interstate System in Good condition.

Interstate System in Good condition.



## Performance Management Form Edit

State: \_\_\_\_\_ Report Year: \_\_\_\_\_

Overview Attachment **Pavement** B

missions - Part I

**- Pavement Performance Overview**

* P2	Please describe the actions taken by the targets for pavements on the NHS.  <i>Note: This item may be used as an account of actions taken by the submitting state and</i>
P3	Please use this space to provide any general information for the submission (Optional).  <i>Note: This item may be used to provide additional information for the submission, note any complications, direct purposes.</i>
<i>Note: The data submitted should cover the latest available data for the performance period 2019 (§ 490.107(b)(1)(ii)(B)). For Example, enter 86.5% as 0.865.</i>	
* P5	Please provide the 2-year target for the statewide percentage of pavement in Good condition that the State DOT has established for the 2-year performance period.  <i>Note: A 2-year target for statewide percentage of pavement in Good condition is not required for the first performance period.</i>

- Progress in achieving performance targets
- Investment strategy
- Target adjustment (mid performance period only)
- Significant progress
- Extenuating circumstances
- NHPP target achievement

## Performance Management Form Edit

State	Report Year	Report Type	Performance Period	Report Due Date
Colorado	2022			

- Conditions at the end of the Performance Period
- Discussion about achieving performance targets
- Evaluation of Investment strategies & AM Plans
- Extenuating circumstances
- NHPP target achievement

Overview Attachment Pavement Bridge Cont

### - Pavement Performance Overview

- \* P2 Please describe the actions taken by the submitting State targets for pavements on the NHS.  
*Note: This item may be used as an accompaniment to the actions taken by the submitting state and partners to improve the performance of pavements on the NHS.*
- P3 Please use this space to provide any general comments on the submission (Optional).

Overview Attachment Pavement

### - Pavement Performance Overview

- \* P2 Please describe the actions taken by the submitting State targets for pavements on the NHS.  
*Note: This item may be used as an accompaniment to the FHWA performance report to highlight the actions taken by the submitting state and partners to improve the performance of pavements on the NHS.*
- P3 Please use this space to provide any general comments that may assist FHWA in its review of this part of the submission (Optional).

ility Emissions -

formance

## ***Related Plans and Reporting Requirements***

**State DOTs** are required to:

- Develop & Implement State Asset Management Plan
- Update Strategic Highway Safety Plan (SHSP)
- Develop a Freight Plan
- Develop and implement written agreements with MPOs for target setting and reporting
- Discuss progress toward targets in Statewide Transportation Improvement Program (STIP)
- Report MPO performance targets in each update of the Statewide Transportation Plan
- Include a System Performance Report in Statewide Transportation Plan

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## ***Related Plans and Reporting Requirements***

**MPOs** are required to:

- Develop a CMAQ Performance Plan
- Include a System Performance Report in metropolitan transportation plan
- Develop and implement a written agreement with the State DOT for target setting and reporting
- Include a discussion in TIP as to how the MPO program progresses toward targets
- Include a discussion of performance targets in the metropolitan transportation plan



# *Accountability*

- Evaluation of expectations measured with progress in achieving targets and compliance with minimum condition standards
- Effectiveness of TAMP and PBPP in achieving targets
- Specific issues in the context of performance management for pavements
  - FHWA process for determining significant progress
  - FHWA process for determining minimum conditions for Interstate pavements and applying penalties

# *Assessing Significant Progress Toward Achieving Pavement Performance Targets*

## Who

- FHWA determines if a State DOT has made significant progress

## What

- Make determination for each applicable target (pavements)

## When

- Assess significant progress biennially

## ***Pavement TPM Regulations: Minimum Condition and Penalty***

Minimum Condition Level: % of lane-miles of **Interstate System** in poor condition shall not exceed 5.0%

*FHWA will assess the minimum condition level annually using data in HPMS as of June 15*

Penalty: If minimum is not met, State must obligate more of NHPP funds and transfer some of STP funds to Interstate Program in next fiscal year

## *Transparency*

- Make performance elements regularly available to the public
  - Internal communications
  - External communications
  - Feedback loop
- USDOT will facilitate transparency through use of web-based dashboard to communicate aggregated performance results



# Example: Colorado DOT Performance Targets and Results

Performance Area:  
Road Quality

Highways

**Pavement**

Maintenance

Snow & Ice

Traffic Services

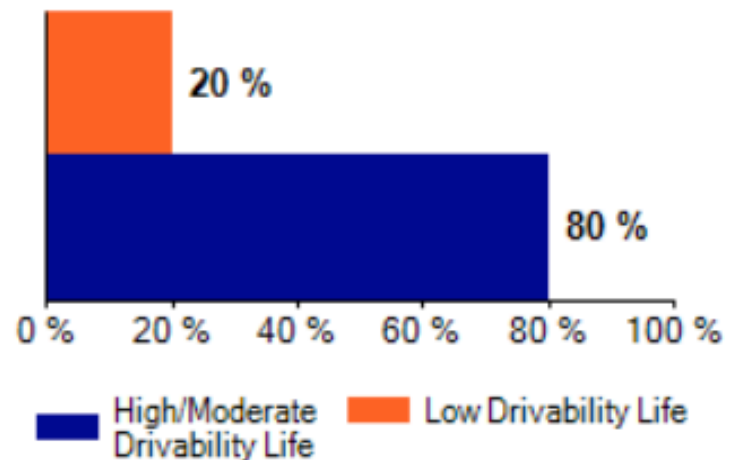
## Pavement

CDOT obtains a better return on taxpayer dollars when it regularly and systematically maintains roadway surfaces rather than fully reconstructing the road after it has deteriorated. [Learn More](#)

Long  
Range  
Goal  
**80%**

Actual  
for  
2016  
**80%**

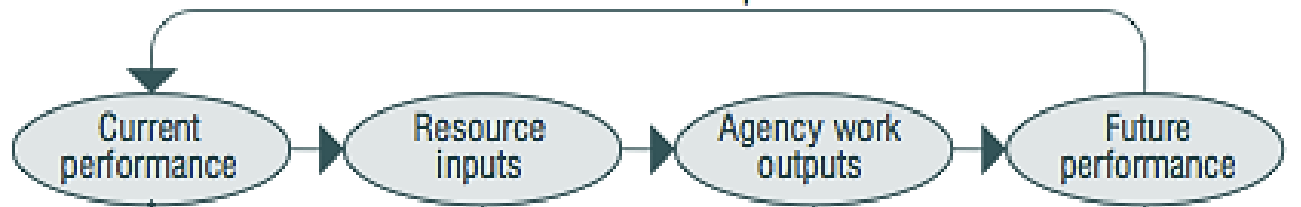
### Percent of Pavement Drivability



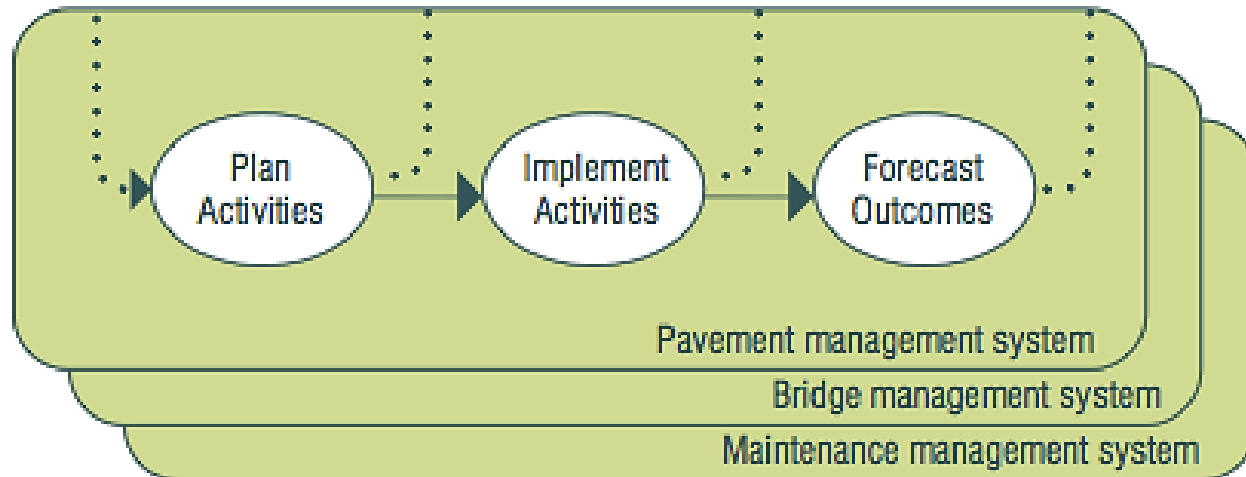
# Establishing a Feedback Loop

External domain

Feedback loop



Internal domain



## ***Lags in Performance Improvement***

- Difference in time between when money is allocated and when projects are completed
- Preventive maintenance shows condition benefits years later
- Data collection cycle: may take one to two years to observe improved performance following project
- Actual project costs tend to be higher than projected in current dollars due to delays coupled with construction inflation and project realities



# *Other Reasons Predicted and Actual Performance May Differ*

*Expenditures Differ from Projections*

*Cost Escalation*

*Agency Behavior Different from Model*

*Change in Priorities*

*Different Deterioration Patterns*

*Changes in Efficiency/Technology*

*Unplanned Events*





## *Facilitated Class Discussion*

- What are the potential approaches for reporting and communicating performance internally and externally?
- What factors may result in actual performance either lagging behind or differing from actual performance?
- What can be done to address lagging performance?
- What is required after the initial performance period?



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## *Knowledge Check*

- Describe the steps in monitoring, reporting and evaluating performance targets and actual performance
- Explain issues in comparing planned to actual performance
- Identify factors that may require performance target adjustment at the midpoint

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## *Contacts*

For questions or more information, please contact:

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*Questions?*



U.S. Department of Transportation  
Federal Highway Administration

