

# Transportation Performance Management

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## *MAP 21: Rulemaking and Asset Condition*

Performance Measures: Pavement Condition to Assess  
the National Highway Performance Program

Virginia Asphalt Association Conference  
Richmond, VA  
October 2, 2017



U.S. Department of Transportation  
Federal Highway Administration



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# Outline

- TPM Legislative and Regulatory Requirements for Pavements
- National Pavement Performance Measures
- Pavement Target-Setting Process
- Resources



# ***TPM Legislative and Regulatory Requirements for Pavements***

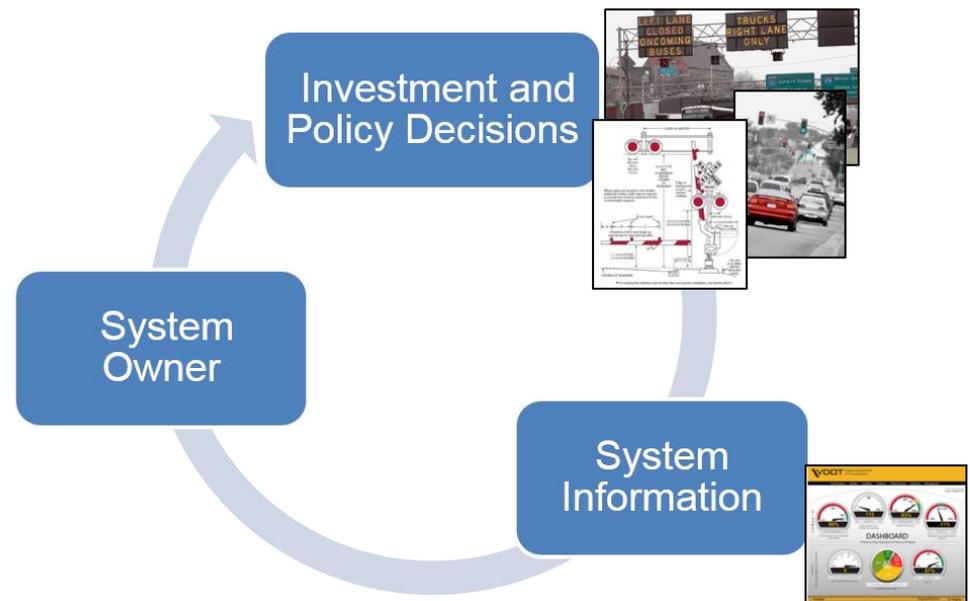


U.S. Department of Transportation  
**Federal Highway Administration**



# Transportation Performance Management (TPM)

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

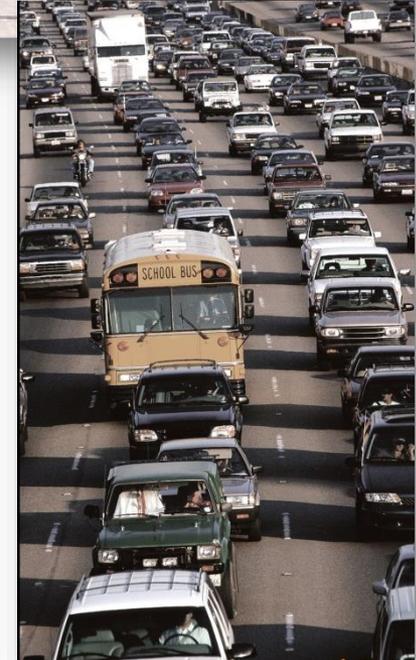


# *TPM Elements*



## ***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 – Virginia DOT (VDOT) Example

Virginia.gov Online Services | Commonwealth Sites | Help | Governor  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:

Pavement Condition	Bridge Condition	Ride Quality						
Target 82%	Target 92% Non-Red (Non-SD)	Target 85%						
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<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%						



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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



# *National Pavement Performance Measures*



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# ***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

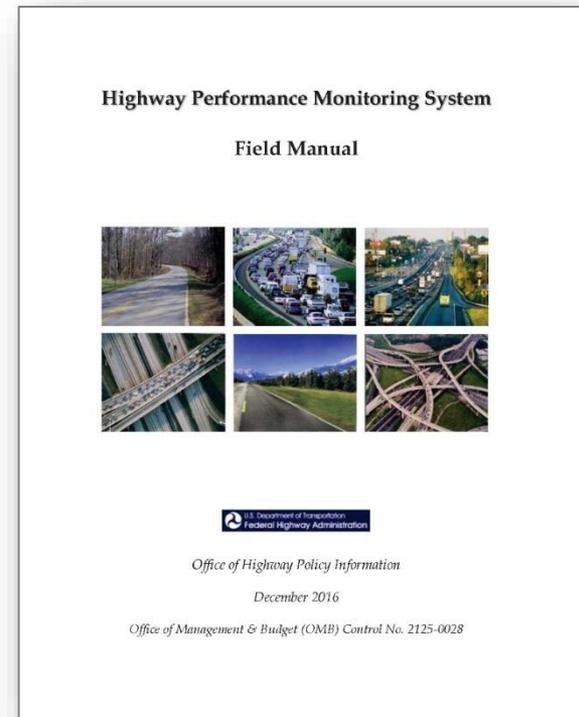
## ***Supporting Systems: Pavement Management System (PMS)***

- 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*

## **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

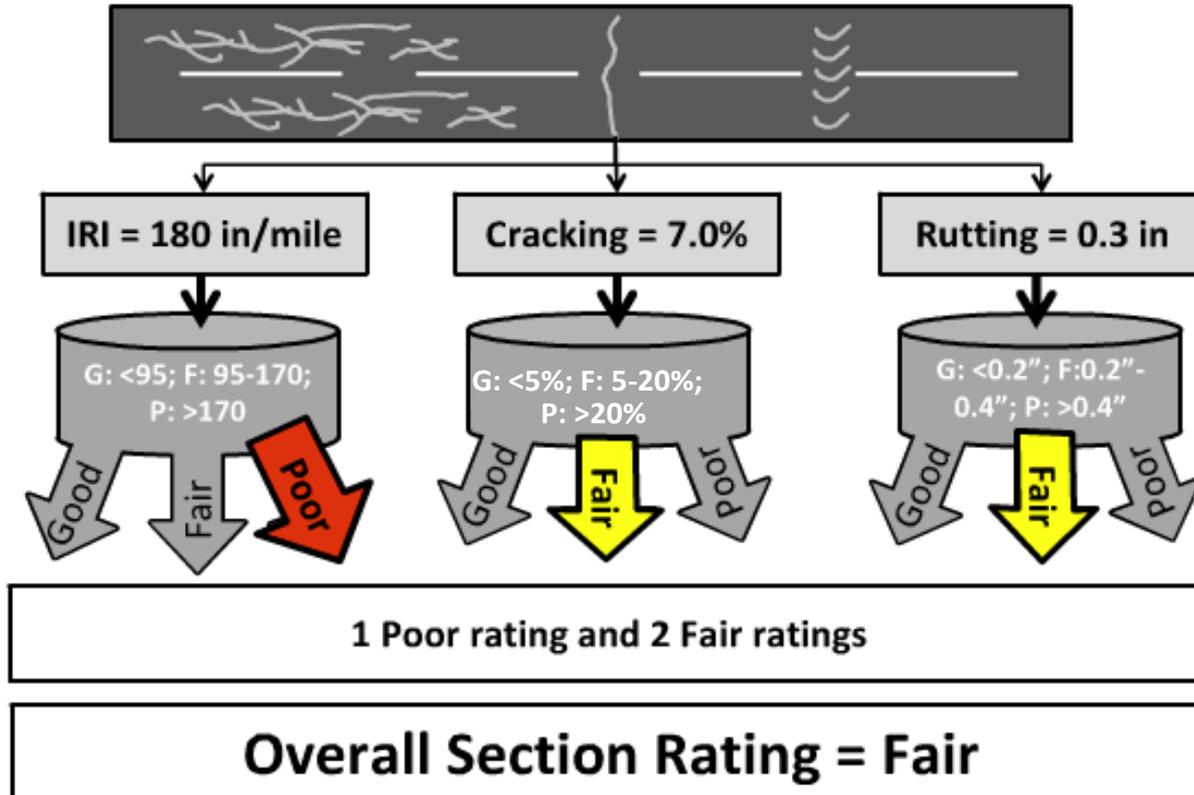
	Pavement Type		Measures
	Asphalt and Jointed Concrete	Continuous Concrete	
Overall Section Condition Rating	3 metric ratings (IRI, cracking and rutting/faulting)	2 metric ratings (IRI and cracking)	
Good	All three metrics rated "Good"	Both metrics rated "Good"	percentage of lane-miles in "Good" condition
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	$2.0 < PSR < 4.0$	

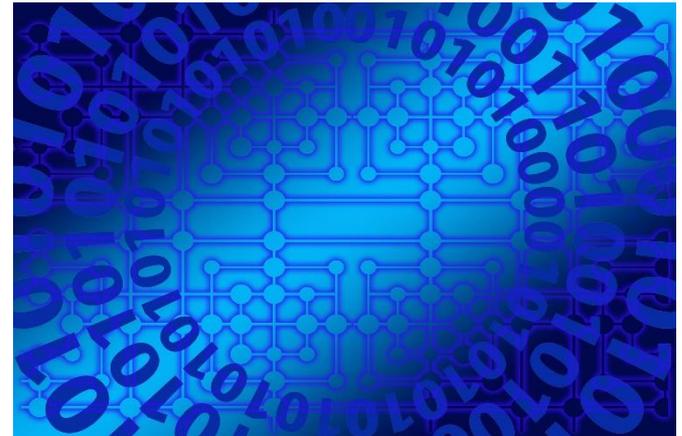
# Pavement Metric Rating Example: Asphalt Surfaces, Interstate



# *Pavement Performance*

Depends on:

- Complete data
- Quality data
- Timely HPMS reporting



## ***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 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



# ***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	

# Example: Colorado DOT Performance Targets and Results

Performance Area:  
Road Quality

Highways

**Pavement**

Maintenance

Snow & Ice

Traffic Services

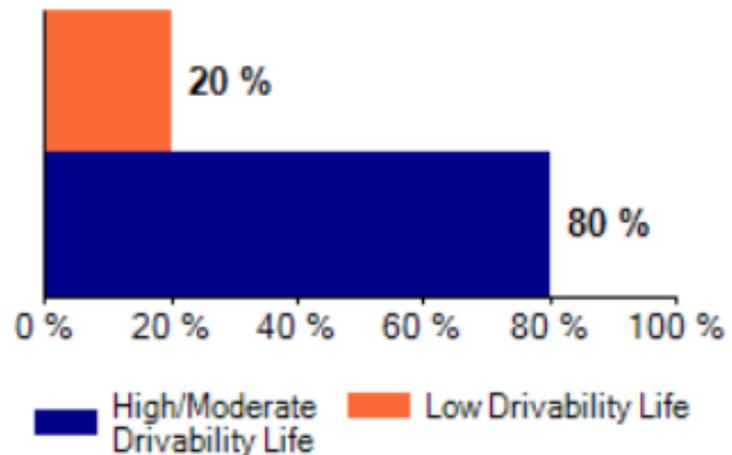
## Pavement

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



# *Resources*



## ***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)

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## ***FHWA Resources***

- TPM Internet Site:
  - <https://www.fhwa.dot.gov/tpm/>
  
- PM2 Rule
  - <https://www.federalregister.gov/documents/2017/01/18/2017-00550/national-performance-management-measures-assessing-pavement-condition-for-the-national-highway>

# Contacts

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## **Luis Rodriguez**

FHWA Resource Center

Tel: 470-346-8850

Email: [luis.rodriguez@dot.gov](mailto:luis.rodriguez@dot.gov)

## **Thomas Van**

FHWA Office of Infrastructure

Tel: 202-366-1341

Email: [thomas.van@dot.gov](mailto:thomas.van@dot.gov)

## **Max Grogg**

FHWA Office of Infrastructure

Tel: 515-233-7306

Email: [max.grogg@dot.gov](mailto:max.grogg@dot.gov)



*Questions?*



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