Implementation of MAP-21 Performance Provisions

A Focus on Pavement Condition and Asset Management

Pavement Evaluation 2014

Federal Highway Administration
September 15, 2014
How is performance incorporated into MAP-21 and how will regulations be implemented?
**The MAP-21 Charge** *(23 USC 150(a) - Declaration of Policy)*

<table>
<thead>
<tr>
<th>Performance Management</th>
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<tr>
<td><strong>Will:</strong></td>
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<tr>
<td>• transform the Federal program</td>
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<td>• provide a means to the most efficient investment of funds</td>
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<td><strong>By:</strong></td>
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<td>• refocusing on national transportation goals,</td>
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<td>• increasing accountability &amp; transparency, and</td>
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<td>• improving project decision making</td>
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MAP-21 Background-Performance Elements

- National Goals
- Measures
- Targets
- Plans
- Reports
- Accountability and Transparency

www.fhwa.dot/map21
**Implementation Principles**

- Provide for a national focus
- Phase in requirements
- Consider risk and constraints
- Understand that priorities differ
- Minimize the number of measures
- Increase accountability/transparency
**USDOT Performance Measure Areas**

- Highway Safety
- Pavement Condition
- Bridge Condition
- System Performance
- Traffic Congestion
- On-road Mobile Source Emissions
- Freight Movement on the Interstate
- Transit State of Good Repair
- Transit Safety Criteria
10 Inter-related Rulemakings

Highway Safety Grant Programs
Federal-aid Highway Programs
Public Transportation Programs

NHTSA
FHWA
FTA

1 Rule
6 Rules
3 Rules
FHWA Proposal Comment Periods – 2014 & 2015

Performance Management Implementation Overview
What is the current state of pavements on the National Highway System?
Transportation Performance Management

National Highway System

• Expanded by MAP-21
  – Interstate System and Other Principle Arterials
  – Strategic Highway Network and Major Connectors
  – Intermodal Connectors

• Facts
  – 223,000 miles
  – 771,000 lane-miles
  – 88% State owned
  – 5.4% US mileage
  – 55.0% total travel
Most Recent Resurfacing

<table>
<thead>
<tr>
<th>Years Since Last Resurfacing</th>
<th>Percent of National Highway System</th>
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<tr>
<td>0-5</td>
<td>26%</td>
</tr>
<tr>
<td>6-10</td>
<td>31%</td>
</tr>
<tr>
<td>11-15</td>
<td>20%</td>
</tr>
<tr>
<td>16-20</td>
<td>12%</td>
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<tr>
<td>&gt; 20</td>
<td>11%</td>
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</table>

Flexible: 69%
Composite: 19%
Rigid: 12%
Allocation of Federal Funds on NHS

- New Route
- Reconstruction (Added Capacity)
- Reconstruction (No Added Capacity)
- Restoration & Rehabilitation
- Resurfacing
- New Bridge
- Bridge Replacement
- Major Bridge Rehabilitation
- Minor Bridge Rehabilitation
- Safety/Traffic/TSM

Source: Highway Statistics 2012 (Table FA-6A) – Financial Management Information System – FY2012

Performance Management Implementation Overview
**NHS Performance Trends**

- **Percent Good Pavements**
  - 2006: 60%
  - 2007: 62%
  - 2008: 60%
  - 2009: 62%
  - 2010: 59%
  - 2011: 57%
  - 2012: 55%

- **Percent Poor Pavements**
  - 2006: 10%
  - 2007: 8%
  - 2008: 10%
  - 2009: 12%
  - 2010: 10%
  - 2011: 12%
  - 2012: 15%
Annual Improvement – Good Pavements

No. of States with Increase in % of Good Pavements

- 2007: 29
- 2008: 24
- 2009: 28
- 2010: 24
- 2011: 28
Annual Decrease in Poor Condition

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of States with Decrease in % of Poor Pavements</th>
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</thead>
<tbody>
<tr>
<td>2007</td>
<td>30</td>
</tr>
<tr>
<td>2008</td>
<td>31</td>
</tr>
<tr>
<td>2009</td>
<td>25</td>
</tr>
<tr>
<td>2010</td>
<td>24</td>
</tr>
<tr>
<td>2011</td>
<td>25</td>
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</table>
How are we addressing the challenges in establishing a national pavement measure?
Transportation Performance Management

**Pavement/Bridge Performance Elements**

- Interstate and NHS
- Focus on Condition
- State and MPO Targets
- NHS Asset Management Plan
- Target Achievement and Minimum Condition Req,
Challenges and Considerations

- National Data Source
- Consistency in Collection
- Link to Decisions
- Element Level Data
- Advancing Technologies
- Target Setting
What Did We Hear?

- Burden on States and MPOs
- Avoid a “Worst-First” Approach
- Consistency and Flexibility
- Pavement Condition Suggestions
- Bridge Condition Suggestions
- NHS Expansion
- Existing Data Sources
Pilot Studies Conducted

• **1st Pilot Study - 2010**
  - Objective – Evaluate how 3 states report pavement and bridge performance for the same corridor
  - Corridor – I-95 in DE, MD, and VA

• **2nd Pilot Study - 2011**
  - Objective – Test out Tier 1 and 2 approaches to report pavement and bridge condition for the same corridor
  - Corridor – I-90 in WI, MN, and SD
I-90 Study - Approach

• Select a three-state pilot corridor

• Collect data sets
  • Federal data for pavements and bridges
  • State pavement data
  • Field collection for **pavement** data

• Compare data and measures

• Identify issues and recommend improvements
I-90 Bridge Conditions - Metrics

- Structurally deficient – 3%

2. Minimum Rating

3a. Weights, based on HI

3.b Weights, based on SR

3.c Equal weights

3.d Variable weights

Performance Management Implementation Overview
Pavement Measure Evaluation

- Evaluate Different Data Sources
  - State Database
  - HPMS Database
  - Field Collected Data

- Evaluate Different Methods
  - Tier 1 – IRI based approach
  - Tier 2 – Composite Condition approach
  - Tier 3 – Structural Measurement approach
**IRI Comparison – Summary**

Do HPMS, state, and field data collection methods tell us the same thing?

![Bar chart showing comparison between HPMS, State, and Field data collection methods. The chart illustrates the percentage of data in Good, Fair, and Poor categories across these methods.](chart.png)
# Composite Data Element Comparison

<table>
<thead>
<tr>
<th>Element</th>
<th>Confidence in Data</th>
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<tbody>
<tr>
<td>IRI</td>
<td>High</td>
</tr>
<tr>
<td>Cracking %</td>
<td>Low/Med</td>
</tr>
<tr>
<td>Cracking Length</td>
<td>Low</td>
</tr>
<tr>
<td>Rutting</td>
<td>High</td>
</tr>
<tr>
<td>Faulting</td>
<td>Low</td>
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</table>

- **State Data** or **HPMS Data**
- **Field Collected Data**
Comparing Good/Fair/Poor Options

Field Collected Data

IRI + rutting flag

FCI

IRI

Good  Fair  Poor
NCHRP 20-24(82)

HPMS represents data used to make project selection decisions

HPMS Staff

PMS Staff

Performance Management Implementation Overview
**NCHRP 20-24(82) Comparison of Metrics**

- **IRI-1**
  - Poor: 9%
  - Good: 23%
  - Fair: 68%

- **PMS-1**
  - Poor: 21%
  - Fair: 11%
  - Good: 68%

- **IRI-2**
  - Poor: 6%
  - Fair: 37%
  - Good: 57%

- **PMS-2**
  - Poor: 11%
  - Fair: 37%
  - Good: 52%

- **IRI-3**
  - Poor: 9%
  - Good: 33%
  - Fair: 64%

- **PMS-3**
  - Poor: 2%
  - Fair: 54%
  - Good: 44%

- **IRI-4**
  - Poor: 16%
  - Fair: 44%
  - Good: 40%

- **PMS-4**
  - Poor: 19%
  - Fair: 38%
  - Good: 43%
How are we addressing the Asset Management requirements in MAP-21?
What Is Asset Management?

Asset management is a strategic and systematic process of operating, maintaining, and improving physical assets, with a focus on engineering and economic analysis based upon quality information. (23 U.S.C. 101(a)(2), MAP-21 § 1103)

NHS Plan

- Inventory, condition, risk, financial plan, investment strategies
- Leads to a program of projects
- Process certified every 4 years
FHWA Initiatives

- Pilot Project: Development of Risk-based Transportation Asset Management Plans
  - Louisiana, Minnesota, New York State DOTs

- Transportation Asset Management Expert Task Group
  - a forum to discuss changes in the way highway agencies are managing assets
Resources Are Available

- FHWA Asset Management Website
  http://www.fhwa.dot.gov/asset/index.cfm
- NHI Transportation Asset Management Training Course
- AASHTO Asset Management Guide – A Focus on Implementation
- AASHTO Asset Management Subcommittee
- TRB Asset Management Committee
What other resources are available now?
TPM Related Initiatives

- Surface Distress & Pavement Profiler Pooled Funds
- Pavement Data Quality Project
- Let’s Talk Performance Webinars
- Performance-based Planning Workshops/Guides
- Travel Time Dataset
- Safety Target Setting
- Improving Transportation Operations
- Technical Assistance Program and Training
wwwfhwadotgovtpm
Submit comments to:

www.regulations.gov

Safety PM Docket Number:

FHWA-2013-0020

http://www.regulations.gov/#!docketDetail;D=FHWA-2013-0020

HSIP Docket Number:

FHWA-2013-0019

http://www.regulations.gov/#!docketDetail;D=FHWA-2013-0019

Planning Docket Number:

FHWA-2013-0037

http://www.regulations.gov/#!docketDetail;D=FHWA-2013-0037