Implementation of MAP-21 Performance Provisions

A Focus on Pavement Condition and Asset Management

2014 Arizona Pavement/Materials Conference

Federal Highway Administration
November 19, 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>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Will:</strong></td>
</tr>
<tr>
<td>• transform the Federal program</td>
</tr>
<tr>
<td>• provide a means to the most efficient investment of funds</td>
</tr>
<tr>
<td><strong>By:</strong></td>
</tr>
<tr>
<td>• refocusing on national transportation goals,</td>
</tr>
<tr>
<td>• increasing accountability &amp; transparency, and</td>
</tr>
<tr>
<td>• improving project decision making</td>
</tr>
</tbody>
</table>
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

1 Rule

FHWA

6 Rules

FTA

3 Rules
Transportation Performance Management

**FHWA Proposal Comment Periods – 2014 & 2015**

<table>
<thead>
<tr>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sep</th>
</tr>
</thead>
</table>

**Stage 1**
- HSIP Safety PM Planning

**Stage 2**
- Infrastructure Cond. PM
- Asset Management

**Stage 3**
- System Performance+ PM
What is the current state of pavements on the National Highway System?
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

- Composite: 19%
- Rigid: 12%
- Flexible: 69%

Years Since Last Resurfacing:
- 0-5: 26%
- 6-10: 31%
- 11-15: 20%
- 16-20: 12%
- > 20: 11%
2014 NHS Improvement Types by Federal Funding

- Pavement Improvement, 29.7%
- Pavement Widening, 23.8%
- New Construction, 8.2%
- Bridge Improvements, 7.3%
- Bridge Replacement, 12.9%
- New Bridge Construction, 3.1%
- Safety/traffic Management, 5.0%
- Transportation Enhancements, 4.0%
- Other, 6.0%
NHS Pavement Performance Trends

- Good - US
- Good - AZ
- Poor - US
- Poor - AZ

2006 2007 2008 2009 2010 2011 2012

Percent Poor Pavements

Percent Good Pavements
Annual Improvement – Good Pavements

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of States with Increase in % of Good Pavements</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>29</td>
</tr>
<tr>
<td>2008</td>
<td>24</td>
</tr>
<tr>
<td>2009</td>
<td>28</td>
</tr>
<tr>
<td>2010</td>
<td>24</td>
</tr>
<tr>
<td>2011</td>
<td>28</td>
</tr>
</tbody>
</table>
Annual Decrease in Poor Condition

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of States with Decrease in % of Poor Pavements</th>
</tr>
</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>
</tr>
</tbody>
</table>
How are we addressing the challenges in establishing a national pavement measure?
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

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Good   Fair   Poor

2014 Arizona Pavement/Materials Conference
**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?
### Composite Data Element Comparison

<table>
<thead>
<tr>
<th>Element</th>
<th>Confidence in Data</th>
</tr>
</thead>
<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>
</tr>
</tbody>
</table>
Comparing Good/Fair/Poor Options

Field Collected Data

- IRI + rutting flag
- FCI
- IRI

0% 20% 40% 60% 80% 100%

Good
Fair
Poor
HPMS represents data used to make project selection decisions

HPMS Staff

PMS Staff
NCHRP 20-24(82) Comparison of Metrics

IRI-1
- Poor: 8%
- Good: 23%
- Fair: 68%

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

IRI-2
- Poor: 5%
- Fair: 37%
- Good: 57%

PMS-2
- Poor: 11%
- Fair: 2%
- Good: 87%

IRI-3
- Poor: 8%
- Good: 93%
- Fair: 4%

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

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

PMS-4
- Poor: 37%
- Fair: 33%
- Good: 30%
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
Transportation Performance Management

www.fhwa.dot.gov/tpm

Transportation Performance Management

Delaware Valley Regional Planning Commission: Utilizing Investment Scenarios to Enhance Transportation Performance

TPM and MAP-21
- What is TPM?
- National Goals
- MAP-21 Performance Requirements Summary
- MAP-21 Putting Performance into Action (pdf, 1.3 mb)
- Implementation Schedule
- Notices of Proposed Rulemaking

Engagement
- Rulemaking Stakeholder Engagement
- Readiness Stakeholder Engagement
- Reporting
- TPM Community of Practice

Resources
- Apply for P2P Technical Assistance
- Noteworthy Practices
- Presentations and Webinars
- Publications
- Tools
- TPM Digest April 2014

Email Notification
- Subscribe to email updates

News and Events
- 2014 Rail Conference June 15 - 18, 2014
- Data Palomar Session Recordings (May 9, 2013)
- View all TPM Events

PDF files can be viewed with the Acrobat Reader®
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