Using MAP-21/FAST to Strengthen New Mexico DOT’s Transportation Asset Management Program

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Asset Management

- Background
- Where are we now?
- Where are we going?
- How do we get there?
Background

- MAP-21 required it – FAST Act
- NPRM comments closed May 2015
- Final Rule by November 2016
- Performance Targets
  - NHS Pavements & Bridges
Where are we now?

Mission –

**NMDOT uses data-driven asset management to maximize use of limited public resources and maintain the state’s transportation infrastructure in the best possible condition.**

*Do what you can, with what you have, where you are.*

Theodore Roosevelt 26th president of US (1858 - 1919)
Draft Guiding Principles

**Condition and Performance**

- Maintain current condition (5% Structurally Deficient) or show slight improvement for the NHS
- When offered an alternative, maintain what we have before adding capacity
- Determine thresholds for Good, Fair, and Poor using Pavement Condition Rating (PCR), with recognition to MAP-21 requirements (pavement)
Draft Guiding Principles

✦ Funding and Resource Allocation
  » Reserve a % of budget for statewide prioritization
  » A % of the model recommendation can be overridden by engineering judgment
  » Delineate funding decisions between Interstate, non-Interstate NHS, non-NHS, and Off System

✦ Management Systems
  » Bridge
  » Pavement
  » Other Assets (Future TBD)
## Asset Condition

at various 10-Year annual funding levels

### Bridge % Poor

<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>$0</th>
<th>$25</th>
<th>$50</th>
<th>$75</th>
<th>$100</th>
<th>$125</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS</td>
<td>3.4%</td>
<td>26.5%</td>
<td>17.5%</td>
<td>8.4%</td>
<td>3.1%</td>
<td>.7%</td>
<td>.4%</td>
</tr>
<tr>
<td>Non-NHS</td>
<td>6.5%</td>
<td>34.2%</td>
<td>28.7%</td>
<td>15.1%</td>
<td>4.7%</td>
<td>.9%</td>
<td>.3%</td>
</tr>
<tr>
<td>All</td>
<td>5.1%</td>
<td>30.6%</td>
<td>23.5%</td>
<td>12.0%</td>
<td>3.9%</td>
<td>.8%</td>
<td>.4%</td>
</tr>
</tbody>
</table>

### Pavement Condition

<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>$110</th>
<th>$165</th>
<th>$220</th>
<th>$275</th>
<th>$330</th>
<th>$385</th>
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</thead>
<tbody>
<tr>
<td>Interstate</td>
<td>58.6</td>
<td>43.3</td>
<td>50.0</td>
<td>51.5</td>
<td>59.3</td>
<td>63.6</td>
<td>66.3</td>
</tr>
<tr>
<td>Non-I NHS</td>
<td>56.7</td>
<td>42.4</td>
<td>47.5</td>
<td>49.7</td>
<td>59.5</td>
<td>64.6</td>
<td>65.3</td>
</tr>
<tr>
<td>Non-NHS</td>
<td>51.1</td>
<td>37.6</td>
<td>44.2</td>
<td>49.8</td>
<td>54.3</td>
<td>57.8</td>
<td>60.9</td>
</tr>
<tr>
<td>All</td>
<td>53.3</td>
<td>39.4</td>
<td>45.6</td>
<td>51.4</td>
<td>56.1</td>
<td>60.1</td>
<td>63.4</td>
</tr>
</tbody>
</table>
Data Collection
Data Collection - Assets
• Pavement Distress Data Collection
  – Mandli Roadview – Contract through 2017 to collect pavement condition statewide
  – 15,000 Lane Miles Collected and Reported Annually
Where are we going?

• Target Setting
• Performance Management
• Life-cycle Planning
• Financial Plans
• Investment Strategies
Performance Measures

- Performance bullet graphs for Bridges and Pavements

![Infrastructure Goal KPIs](image)

- **State Target**
- **Current Condition**
- Metric based on Applied Filters
Financial Plans in TAM

Integrated TAM Program

**PLANNING ACTIVITIES**
- Project Prioritization, Long Range Plan, STIP, other plans

**TAMP**
- Pavement & Bridge Assets
- Asset Management Objectives, Measures
- Performance Gap Identification
- Lifecycle Cost, Risk Management Analysis

**ENGINEERING ACTIVITIES**
- Project Design, Asset Deterioration Modeling, other activities

Financial Plan & Investment Strategies
TAMP Integration in NM

• Planning and Programming is Key

Vision:
Set the standard for a safe, reliable, and efficient transportation system.

New Mexico Transportation Plan
Capital Programs
Transportation Asset Management Plan
Implementation
6-Year State Transportation Improvement Program
NMDOT Strategic Plan
Annual Performance Report
### Sustainability Index in NM

#### To Sustain Current Condition of NMDOT Bridges and Highways

($ millions)

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Bridge need</td>
<td>65</td>
<td>66</td>
<td>68</td>
<td>69</td>
<td>70</td>
<td>72</td>
<td>73</td>
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<td>76</td>
<td>78</td>
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<tr>
<td>Bridge $</td>
<td>94</td>
<td>96</td>
<td>99</td>
<td>103</td>
<td>106</td>
<td>108</td>
<td>109</td>
<td>106</td>
<td>122</td>
<td>124</td>
</tr>
<tr>
<td>Pavement need</td>
<td>250</td>
<td>255</td>
<td>260</td>
<td>265</td>
<td>271</td>
<td>276</td>
<td>282</td>
<td>287</td>
<td>293</td>
<td>299</td>
</tr>
<tr>
<td>Pavement $</td>
<td>119</td>
<td>122</td>
<td>126</td>
<td>130</td>
<td>134</td>
<td>137</td>
<td>138</td>
<td>136</td>
<td>139</td>
<td>141</td>
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<tr>
<td>Total need</td>
<td>315</td>
<td>321</td>
<td>328</td>
<td>334</td>
<td>341</td>
<td>348</td>
<td>355</td>
<td>362</td>
<td>369</td>
<td>377</td>
</tr>
<tr>
<td>Total $</td>
<td>213</td>
<td>218</td>
<td>225</td>
<td>232</td>
<td>239</td>
<td>245</td>
<td>247</td>
<td>242</td>
<td>261</td>
<td>265</td>
</tr>
<tr>
<td>S.I.</td>
<td>0.68</td>
<td>0.68</td>
<td>0.69</td>
<td>0.69</td>
<td>0.70</td>
<td>0.70</td>
<td>0.70</td>
<td>0.67</td>
<td>0.71</td>
<td>0.70</td>
</tr>
</tbody>
</table>

Assumptions: Combine Maintenance, Preservation, Replacement/Reconstruct
- Roughly use SPP models developed in March; assume Reconstruction favored.
- Inflation = Revenue Growth (2%). BIG assumption.
How do we get there?

- Enhance Asset Models
- Data Integration
- Data Driven Decisions
Pavement Management
Pavement Management

• AgileAsset Pavement Management System Database (PMS db)
  – Repository for Mandli Automated Pavement Condition Data
  – Configured to Interpret Most Prevalent Set of Distress
    • And Suggest Most Cost Beneficial Treatment Based on Performance Data (or Benefit)
  – Principle Concept is to Treat and Maintain Good Roads to Keep in Good Condition
  – Configured to…
    • Perform Budgeting Scenarios
    • Perform Performance Scenarios – To Meet FHWA Requirements
    • Develop Long Term Performance Curves
    • Calibrate Pavement Design Models and Laboratory Test Results
Pavement Management

- Pavement is Engineered Material
- Deteriorates Over Time Due to Environment and Loading Conditions
- Reconstruction $$ Can Be Typically 3 to 5 Times What a Preservation or Rehabilitation Cost Will Be
- Adopt Life Cycle of Pavements

<table>
<thead>
<tr>
<th>PCR Range</th>
<th>Treatment Category</th>
<th>Average Cost per Lane Mile ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-86</td>
<td>Monitor - Preventive</td>
<td>16K</td>
</tr>
<tr>
<td>85-66</td>
<td>Preventive – Pres Major</td>
<td>37K</td>
</tr>
<tr>
<td>65-46</td>
<td>Pres Major – Rehab Minor</td>
<td>120K</td>
</tr>
<tr>
<td>45-26</td>
<td>Rehab Minor – Rehab Major</td>
<td>500K</td>
</tr>
<tr>
<td>25-0</td>
<td>Reconstruction</td>
<td>1.5M</td>
</tr>
</tbody>
</table>
QUESTIONS?

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